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Hendrik Hansen, Robert Müller-Török, András Nemeslaki,
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CEE e|Dem and e|Gov Days 2017

Digital Divide in the Danube Region: Is it still significant in explaining ICT adoption in eDemocracy and eGovernment?

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PREFACE

A decade and a half ago Pippa Norris[1] defined Digital Divide as the "divide between Internet-haves and have-nots". At that time, Internet access was indeed limited to a minority both for financial and technical reasons. The age of deregulation and free market competition as well as the mass introduction of internet-capable smart phones has done away with this divide. In industrialised nations, phone-based internet access neither requires technical expertise nor a deep pocket – it is available on every smartphone for a EUR 9.99 (or so) monthly rate plan. Hence, within these nations, the classical divide has been almost nullified. Ludwig Erhard postulated that free-market competition would lead to a "socialisation of progress"[2] – hardly any other industry has validated this tenet to such an extent.

The question remains, whether there is a Digital Divide among the countries in the Central and Eastern European (CEE) region. The evidence would point against it. In terms of internet penetration, the Czech Republic has caught up with Germany (both 88%), Hungary and Slovakia with Austria (all between 80 and 82.5%). Also the new Member States of the EU and the Candidate States are catching up fast (for example, Croatia 74%, Romania 58%, Moldova 48%, typically gaining a few percentage points per year).[3] So are we – or at least soon will be – past the age of the Digital Divide?

Unfortunately, things are not that easy. Internet access, for instance on the mobile phone, does not mean that the internet is used for much more than reading the news (which however in itself is a huge service to democracy as compared to the age of evening news shows on state-run television). The true potential of the internet can only be harnessed by interactive and transactional services, whether in the social media, in consumer transactions, in business or in digital government services. In the public sphere, this concerns both transactional eGovernment services and any form of civic engagement, whether in the social media or in government-driven "eDemocracy" platforms.

As for transactional *eGovernment* services, there may be huge differences both within a population and among the counties of the CEE region. The uptake of such services and the infrastructure associated with them is one of the most important fields in this development. Not only to improve government efficiency and to provide better services to citizenry and businesses – which would be reason enough in themselves – but also to promote such services in general.

Another form of digital divide may originate in the way *social media and eDemocracy services* are used. To have such services at one's disposal is one thing, to be able to work with them properly is something completely different. In the mid-1990-ies, Verba et al.[4] pointed out how important "civic skills" were for the participation of individuals in processes of political participation beyond mere voting. Two decades later, these considerations are amplified in today's social media. Via the digital media, everybody can talk to the world – at least in theory. Having access to the editor function of a social media or participation platform in a web browser via an internet connection at

[1] NORRIS, P.: Digital Divide: Civic Engagement, Information Poverty and the Internet Worldwide. Cambridge University Press, 2001; download from https://www.hks.harvard.edu/fs/pnorris/Acrobat/DIGITAL1.PDF
[2] ERHART, L.: Wohlstand für Alle, Econ Verlag, Düsseldorf, 1957, p. 8;
download from http://www.ludwig-erhard.de/wp-content/uploads/wohlstand_fuer_alle1.pdf
[3] All statistics from internetlivestats.com.
[4] VERBA, S. SCHLOZMANN, K.L., BRADY, H.E.: Voice and Equality – Civic Voluntarism in American Politics, Harvard University Press, 1995, pp. 304ff.

an affordable monthly flat rate does not by a long shot mean that one can also express one's opinions in a convincing (and hopefully legal!) way appealing to other readers on the platform and thereby leverage the digital media to influence opinions. The question has to be asked, whether the new digital divide is still about having or not having the internet, or rather it is about being able or not being able to express oneself in the internet media.

This year's "Central and Eastern European eGovernment & eDemocracy Days" (CEE eGov & eDem Days 2017) and the corresponding proceedings volume aim to explore to what extent and in what regard the Danube Region is digitally divided, what the driving forces of these divisions are and what factors determine them. Understanding the digital divide is pivotal to promote cohesion in the Danube Region and to design effective policies to enhance regional integration.

The organizers of the conference are Andrássy University Budapest, the Austrian Computer Society, the Austrian Institute for European Law and Policy, the Information Society Development Institute, Moldova, the National University of Public Service Budapest and the University of Public Administration and Finance Ludwigsburg. The editors who are representing these institutions are most grateful for the support of the sponsors of the conference and of this volume, especially the Baden-Württemberg-Stiftung, the Austrian Institute for European Law and Policy, the Konrad-Adenauer-Foundation and the Austrian Cultural Forum, Budapest.

Special thanks go to the organizational staff at the National University of Public Service and Andrássy University Budapest for hosting the conference and providing local organization.

The Editors, Budapest/Chişinău/Ludwigsburg/Vienna, April 2017

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eGovernment and Society I

EUROPEAN UNION DIGITAL SINGLE MARKET – GET CONNECTED OR STILL A VISION FROM THE SLOVAK REPUBLIC PERSPECTIVE?

Silvia Ručinská[1] and Miroslav Fečko[2]

Abstract
European Union Internal Market has become a key element of the European integration and of a citizens´ daily life. Some of the European Union Internal Market´s components are well established and functioning, others have still to struggle with existing barriers. New information and communication technologies and the digitalisation challenged the European Union Internal Market and the European Union Member States to move into the digital era. European Union Member States are now facing the need to adapt the four economic freedoms as a crucial part of the European Union Internal Market to a digital freedom. The aim of the article is to analyse the current state of play of the European Union Digital Single Market and to identify most common and urgent existing obstacles of the European Union Digital Single Market from the perspective of the Slovak Republic.

Key words: *European Union, Internal Market, Digital Single Market, Slovak Republic, Barriers.*

1. Introduction

The EU Internal Market as a territory of free movement of goods, services, capital and person is still developing and can be considered as a gradual process, which is characterized by its complexity (Arnold and Wörgötter, 2011; Howart and Sadeh, 2010). The ability to travel, work, buy or sell across the EU Member States has become an integral part of the EU citizen´s daily life, which is hard to imagine not having it. The EU Internal Market is also essential not only for the individuals or businesses, but also for the entire EU economy and EU Member State´s economies. Rueda-Cantuche et al. (2013) highlighted that the EU Internal Market helps to create jobs through the exporting companies, what bring employment opportunities not only in the exporting country but also in the entire EU Internal Market. Egan and Guimaraes (2012) described the EU Internal Market as the key element of EU´s integration and as a precondition for creating jobs and employment across the EU. Juncker (2014) when introducing the European Commission´s political guidelines and when identifying the completion of the EU Internal Market as one of the priorities of the European Commission under his presidency, has stressed out the EU Internal Market as the biggest asset of Europe.

Even though the EU Internal Market is far from completion, because of many different barriers existing in relation to the entire EU Internal Market and within each of the EU Internal Market´s economic freedoms[3], the EU Internal Market has to update itself to new opportunities and

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[2] Pavol Jozef Šafárik University in Košice, Faculty of Public Administration, miroslav.fecko@upjs.sk
[3] For more about the barriers to the entire EU Internal Market and to the free movement of goods, services, capital and person see for example: Guimarães and Egan (2014); Egan and Guimarães (2012); Terták (2010); Hafner, Robin and Hoorens (2014); Jacobsson (2013); Pelkmans and Mustilli (2014); Robin-Olivier (2012); van Riemsdijk (2013).

challenges regarding the use of information and communication technologies (ICT). ICT are now present in all sectors of the economy (European Commission, 2015b), they interfere with social and economic activities (European Commission, 2013) and they are a fundamental part of people´s life, companies´ activities and also of governments. Digital economy helps the markets to grow, fosters the quality of services provided, creates additional sources for employment and economic growth (European Commission, 2015b; Szczepański, 2015). Between 2001 and 2011 the ICT accounted for more than third of the GDP growth and for almost third of the labour productivity growth in the EU and for more than a half of the GDP and labour productivity growth in the USA (European Commission, 2015a; European Commission, 2013).

According to Copenhagen Economics (2010), the Digital Single Market can be considered as a next step of European integration, following the previous milestones represented by the EU Internal Market, European Monetary Union and implementation of the Services Directive. The importance of the Digital Single Market was highlighted by the European Parliament (2015) when concluding, that the potential benefits from completing the Digital Single Market would reach 415 billion euro per year, in the area of e-commerce, e-procurement, single European payments, e-invoicing, cloud computing, online and alternative dispute resolution systems. Paczynski (2014) summed up the positive impacts in the entire EU by 2020, in GDP expenditure measure (0.39% effect), consumption (0.37% effect), Investment (0.90% effect), Exports (0.26% effect), Imports (0.31% effect) and Employment (0.10% effect), which would be achievable because of the Digital Single Market deficiencies´ elimination. Lorenzani and Varga (2014) concluded, that the Digital Single Market will bring in long run a GDP impact of 1% in the EU27 average with a further potential of an initial 3.14% GDP impact also in the EU27 average.

In this paper we are repeatedly using the terms internal market and single market. We don´t consider these terms as synonymous. Some authors tend to use only the term internal market, others do prefer the term single market and a synonymous usage can be also find in the literature. But our intention won´t be to provide a terminological explanation of the different meanings and usages in this paper. We do consider as important to highlight this and to clarify, that we prefer to use the term EU Internal Market, as it is also applied in the primary EU law. Regarding the Digital Single Market, we will be using the term single market, because it was as such defined in the official EU declarations, agendas, priorities, etc.

The aim of this paper is to analyse the current state of play of the Digital Single Market in the EU and to identify the most common and urgent existing barriers to the Digital Single Market with a specific view from the perspective of the Slovak Republic. The paper is structured into two main parts. The first part of the paper will analyse the entire Digital Single Market, its importance and impact to the economy of the EU and its relevance as an EU political priority. In addition to that, the most common barriers will be identified, which hinder the completion of the Digital Single Market and the use of its potential. Our intention won´t be to identify barriers to the entire EU Internal Market though. We will focus only on barriers occurring in the online space, or in relation to the use of Digital Single Market´s components. The second main part will focus on the Slovak Republic´s experiences in terms of building the Digital Single Market and tackling with existing obstacles.

2. Digital Single Market and barriers to the Digital Single Market

The Digital Single Market can be understood as a market ensuring the free movement of goods, services, capital and person without barriers hindering the use of digital technologies and online

services, allowing cross border online purchase of goods and services, bringing benefits to consumers and businesses, protecting consumers and personal data and thus fostering economic growth, jobs and innovation across the EU and it´s Member States (European Commission, 2015b; Copenhagen Economics, 2010).

A functioning Digital Single Market and in this regard a better use of the potential what the digital market has, have become one of the ten priorities of the European Commission under the presidency of J.C. Juncker. A connected Digital Single Market was introduced as a horizontal political priority important for every sector of the economy, including the public sector (Juncker, 2014). The Digital Single Market as a theme of high priority wasn´t any knew though. According to Szczepański (2015) EU´s efforts aimed at the components of the Digital Single Market have started in mid 1990s. Copenhagen Economics published in 2010 a study regarding economic impact of the Digital Single Market, which highlighted the necessity of tackling deficiencies of the Digital Single Market. The Study summarized, that some steps have been done in the past, but nevertheless the Digital Single Market can´t be considered as completed and its potential remains untapped, even though it brings considerable benefits for individuals, companies but also for the public sector (Copenhagen Economics, 2010). Polanski (2015) has also stressed out, that the current situation in the EU can´t be considered as a completed Digital Single Market, but rather as 28 individual digital markets.

Building on the Digital Single Market as of one of the Commission´s priorities, the European Commission adopted the Digital Single Market Strategy in 2015. The Digital Single Market Strategy was introduced based on three main pillars, Better access for consumers and businesses to online goods and services across Europe; Creating the right conditions for digital networks and services to flourish; Maximising the growth potential of our European Digital Economy (European Commission, 2015b). Even though in 2016, 85% of all EU households have had internet access at home (Eurostat, 2017c), 82% of individuals aged from 16 to 74 in the EU have used internet in last 3 months and only 14% of individuals have never used internet (Eurostat, 2017b), only 18% of individuals in the EU have used internet for ordering goods or services from other EU Member States (Eurostat, 2017a). To accomplish the Digital Single Market Strategy, the European Commission (2017a) have set the update of e-commerce rules, review of consumer protection rules, affordability of parcel delivery, ending of an unjustified geo-blocking, antitrust competition inquiry, modernisation of copyright rules, review of online cross border distribution of television and radio programmes and VAT burdens as the main goals for a better access for consumers and businesses to online goods. To improve the digital networks and services, the European Commission (2017c) identified telecom rules, audiovisual media rules, online platforms and data security as the most urgent problems to be dealt with. Finally in relation to the third pillar focusing on the growth potential and benefits of the European Digital Economy, the attention should be aimed on to free flow of data, standards and interoperability and on the inclusive digital economy helping the citizens to take advantage from it (European Commission, 2017b).

Despite the importance of the Digital Single Market and of the past and current strategies to considerably progress in its completion, barriers hindering this completion still exist. The European Commission (2013) summarized overall barriers to ICT, which can be considered as limits to the importance and impact what the ICT have. These ICT barriers were presented in four main groups, introducing their character and type of obstacle they represent. Educational barriers have been analysed in relation to the lack of needed skills, incompatibility of education and practice needs, underestimation of the importance and of the potential which the ICT have. Organisational and cultural barriers were identified as connected to a lack of entrepreneurship, lack of exploitation of

the ICT´s potential and as other entrepreneurship type deficiencies. Policy barriers were elaborated reflecting the everlasting legal and regulatory fragmentation within the EU Member States, lack of flexibility in labour market related activities and infrastructure orientation rather than demand development. Final group of barrier have been more of a subjective nature, represented by social barriers and different kinds of hesitations in adopting and using new ICT.

A Digital Single Market should create more opportunities for individuals and business, especially in relation to employment and restrict existing barriers. These barriers can be of different nature, as for example an unequal treatment in delivery costs and delivery conditions, geo-blocking, lack of digital skills, lack of digital technologies and fragmented national regulations (European Commission, 2016a; Bassot and Hiller, 2016). European Parliament (2015) has also pointed out the existence of barriers hindering the completion of the Digital Single Market, however with an additional statement, that it is unlikely to remove all existing barriers, because of the overall complexity of the barriers removing process. The most urgent obstacles identified by the Mapping the Cost of Non-Europe 2014-2019 study (European Parliament, 2015) were related to e-privacy, e-payments, VAT payments, consumer protection and dispute resolution, data protection and geo-blocking. Existing subjective barriers, which are related to trust issues of the consumers in the online space are characterized by the tendency of the consumers to avoid buying across borders and to prefer to shop nationally, mainly because of cultural, language or brand recognition influences (European Commission, 2015a).

According to the Flash Eurobarometer 413, the companies which sell online to the EU Member States, but also the companies which don´t sell online, including such ones which are willing to try in the future, encounter difficulties which are most commonly cost related. These difficulties represent obstacles related to high delivery costs, costly guarantees and returns, resolving complains and disputes but also unfamiliarity with existing rules in other EU Member States (European Commission, 2015c).

Barriers to the Digital Single Market are of different nature. The main occurring barriers are educational, organisational, policy, legal, regulatory, cultural, social, language deficiencies and restrictions. Some of these obstacles can the EU Member States tackle, by a more consistent adoption of needed rules and by removing considerably high regulatory fragmentation. Other barriers are of a more subjective nature and that's why they can be seen as persisting barriers to the Digital Single Market. Even if not all barriers could be eliminated, this shouldn't hinder the EU Member States of trying it, because the potential benefits for the overall EU economy and for the citizen's life could be significant.

3. Digital Slovak Republic – state of play and restrictions

As a reaction to the activities of the European Commission in the field of Digital Single Market, but also responding to the changes in the overall society regarding the digital age, Slovak Republic is trying to harmonize and coordinate its activities. According to the Legislative Act No. 575/2001 about the organization of government's activities and organization of the central state administration, a special office called The Office of the Deputy Prime Minister of the Slovak Republic for Investments and Informatisation was created. Following the Statute of the Office of the Deputy Prime Minister of the Slovak Republic for Investments and Informatisation (2017), its main goal is to contribute to a common state policy in the field of using EU funds and regarding informatisation and investments.

To procced even more in the digitalization of the Slovak Republic and to enable a coordinating approach, Peter Pellegrini, as the Deputy Prime Minister for Investments and Informatisation, proposed the Action plan: Single Digital Market – opportunity for Slovakia (Action Plan). The Action Plan (2017) refers to the European Commission's priorities in the Digital Single Market and to the three main pillars of the Digital Single Market Strategy. The Action Plan (2017) highlights the importance of the Digital Single Market when stating, that its successful implementation will affect the position of the Slovak Republic in the global competition.

To proceed in the next transformation and in the development of the digital economy, the Action Plan (2017) projects the change of rules to simplify and to improve the people's life, to create appropriate conditions for entrepreneurs and for sustainable jobs and to modernize the functioning of the public administration. Five priority themes have been proposed to fulfil the expected outcomes: creation of a data economy, digitalization of public services for an inclusive information society (e-society), online platforms to support digital economy and smart industry, modern tools for the digital creative industry's development, education and digital skills for the modern age. The strength of the Action Plan is, that in each of the priority themes it refers to other existing plans and documents existing in the Slovak Republic and to EU's initiatives. Therefore, it can contribute to the orientation in such complex and interlinked theme, as the digitalization certainly is. Also of a major importance is an elaboration of the priority themes into specific tasks which should be dealt with, with the addition of time schedules in each task.

A concept of political, professional and participatory coordination is also a part of the Action Plan (2017). When assessing the real contribution of the Action Plan to fulfil all the specified tasks and priorities, concerns may arise, especially when considering the fragmentation of competences in this field in the Slovak Republic. Altogether 15 different ministries and official state authorities, but also other subjects are involved in fulfilling the Action Plan's tasks. Thus, the success relies on the cooperation of the Deputy Prime Minister for Investments and Informatisation; Government Office; Plenipotentiary of the Government of the Slovak Republic for the Development of Civil Society; Ministry of Economy; Ministry of Finance; Ministry of Interior; Ministry of Labour, Social Affairs and Family; Ministry of Transport and Construction; Ministry of Justice; Ministry of Culture; Ministry of Education, Science, Research and Sport; Office for Personal Data Protection; National Security Authority; Office for Public Procurement; Industrial property Office; supervision offices but also of universities. Even though the number of responsible authorities in each of the particular tasks isn't higher than four, the main role what the Action Plan is aiming for, the coordinating role, can be one of the weaknesses because of responsibility's fragmentation. Such responsibility's mixture combined with an unclear financing needs and covering expenses of each task, can be considered as highly risky and threatening a successful implementation.

The Action Plan has been interdepartmental reviewed in early February 2017 and the next steps of its adopting are going to be focused onto consider, accept or reject the comments of state government authorities but also from civil society and third sector subjects. According to the Action Plan (2017) altogether 174 comments, 95 of them marked as substantial, from 20 different subjects and from the public, have been raised during the interdepartmental review process. By way of example, the Ministry of Finance, but also the Ministry of Interior and Ministry of Culture have claimed the missing financial requirements for implementation and sustainability; Ministry of Culture requested to withdraw the entire material, because as it is a horizontal policy, it should be formulated from beginning in close cooperation of all relevant subjects; The American Chamber of Commerce in Slovakia proposed addition of new tasks of the Action Plan aimed at the important safety and security issues; The National Union of Employers highlighted the insufficient

communication with employers regarding the elaboration of this Action Plan; Slovak Association for Branded Products identified the missing risk assessment for businesses as one of the weaknesses of the Action Plan; and other comments of concrete subjects claiming the absence of competences in particular field or in the opposite refusing to take responsibilities in specific area dealt with by the Action Plan. For the real assessment, the final text should be analysed though. But the overall intention of adopting a strategic document can be considered as needed.

4. Conclusion

The EU Internal Market can be considered as one of the EU's most important achievements. Free movement of goods, services, capital and person have come a long way, since the initial steps when introducing the Single European Act and when regularly reformulating actions of the EU regarding the four economic freedoms. Despite the achievements, barriers to EU Internal Market and to the free movement of goods, services, capital and person persist up until present. The digital era and ICT development, have brought opportunities to grow the economies worldwide. In this regard, however, new challenges have also appeared, what the EU Internal Market is trying to deal with by creating the Digital Single Market. The Digital Single Market has brought benefits to the economy, businesses and citizens, but its potential is far from reached. Barriers to the Digital Single Market are of educational, legal, regulatory, organisational, policy, social, cultural and language nature. Next research could be focused on, whether the barriers to the Digital Single Market exist because of the existence of the barriers to the EU Internal Market, or whether they aren´t interrelated. Considering the Slovak Republic and its achievements in the Digital Single Market, the fragmentation in competences and the need to cover expenses regarding digital market's priorities and tasks, are of potential high importance for the future to be dealt with.

5. References

[1] Action plan: Single Digital Market – opportunity for Slovakia. 2017. Legislative process number LP/2017/53.

[2] ARNOLD, J. M. and WÖRGÖTTER, A.: Structural reforms and the benefits of the enlarged EU internal market: still much to be gained. In: Applied Economics Letters. Vol. 18, Issue 13, 2011, pp. 1231-1235.

[3] BASSOT, É. and HILLER, W.: The Juncker Commission's ten priorities. State of play in mid-2016. European Parliament: European Parliamentary Research Service, 2016.

[4] COPENHAGEN ECONOMICS, The Economic Impact of a European Digital Single Market, 2010. Available at «http://www.epc.eu/dsm/2/Study_by_Copenhagen.pdf» Accessed 16 January 2017.

[5] EGAN, M. and GUIMARAES, H.: Compliance in the single market. In: Business & Politics. Vol. 14, Issue 4, 2012, pp. 1-28.

[6] EUROPEAN COMMISSION, Unlocking the ICT growth potential in Europe: Enabling people and businesses. Using Scenarios to Build a New Narrative for the Role of ICT in Growth in Europe. Luxembourg, Publications Office of the European Union, 2013.

[7] EUROPEAN COMMISSION, 2015a. Commission Staff Working Document. A Digital Single Market Strategy for Europe - Analysis and Evidence. Accompanying the document Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions A Digital Single Market Strategy for Europe. SWD(2015) 100 final.

[8] EUROPEAN COMMISSION, 2015b. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. A Digital Single Market Strategy for Europe. COM(2015) 192 final.

[9] EUROPEAN COMMISSION, 2015c. Flash Eurobarometer 413. Companies engaged in online activities. Available at «http://ec.europa.eu/public_opinion/flash/fl_413_en.pdf» Accessed 23 January 2017.

[10] EUROPEAN COMMISSION, 2016a. A digital single market in Europe. Bringing down barriers to unlock online opportunities. Luxembourg: Publications Office of the European Union.

[11] EUROPEAN COMMISSION, 2017a. Better access for consumers and business to online goods. Available at «https://ec.europa.eu/digital-single-market/node/78515» Accessed 20 January 2017.

[12] EUROPEAN COMMISSION, 2017b. Economy & Society. Available at «https://ec.europa.eu/digital-single-market/node/78517» Accessed 20 January 2017.

[13] EUROPEAN COMMISSION, 2017c. Right environment for digital networks and services. Available at «https://ec.europa.eu/digital-single-market/node/78516» Accessed 20 January 2017.

[14] EUROPEAN PARLIAMENT, Mapping the Cost of Non-Europe, 2014 -19. Brussels: European Added Value Unit, Directorate for Impact Assessment and European Added Value, Directorate-General for Parliamentary Research Services (EPRS), European Parliament, 2015.

[15] EUROSTAT, 2017a. Individuals using the internet for ordering goods or services from other EU countries. Available at «http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=tin00003&plugin=1» Accessed 16 January 2017.

[16] EUROSTAT, 2017b. Internet use by individuals. Available at «http://ec.europa.eu/eurostat/tgm/refreshTableAction.do?tab=table&plugin=1&pcode=tin00028&language=en» Accessed 16 January 2017.

[17] EUROSTAT, 2017c. Level of internet access – households. Available at «http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=tin00134&plugin=1» Accessed 16 January 2017.

[18] GUIMARAES, H. and EGAN, M.: Barriers to Business in the Single Market, 2014. Available at http://ssrn.com/abstract=2399098 Accessed 20 December 2016.

[19] HAFNER, M., ROBIN, E. and HOORENS, S.: The Cost of Non-Europe in the Single Market. I - Free Movement of Goods. Brussels: European Union, 2014.

[20] HOWARTH, D. and SADEH, T.: The ever incomplete single market: differentiation and the evolving frontier of integration. In: Journal of European Public Policy. Vol. 17, Issue 7, 2010, pp. 922-935.

[21] JACOBSSON, J.: Liberalisation of Service Mobility in the EU's International Trade Agreements: As External as it Gets. European Journal of Migration & Law, Vol. 15, No. 3, 2013, pp. 245–261.

[22] JUNCKER, J.-C.: A New Start for Europe: My Agenda for Jobs, Growth, Fairness and Democratic Change. Political Guidelines for the next European Commission. Opening Statement in the European Parliament Plenary Session, 2014. Available at «http://ec.europa.eu/priorities/sites/beta-political/files/juncker-political-guidelines_en.pdf» Accessed 9 January 2017.

[23] Legislative Act No. 575/2001 about the organization of government's activities and organization of the central state administration.

[24] LORENZANI, D. and VARGA, J.: The Economic Impact of Digital Structural Reforms. European Commission Economic Papers, No 529, 2014.

[25] PACZYNSKI, W.: The Cost of Non-Europe in the Single Market. III. Digital Single Market. European Parliament. European Parliamentary Research Service. European Added Value Unit, 2014.

[26] PELKMANS, J. and MUSTILLI, F.: The Cost of Non-Europe in the Single Market. II The Single Market for Services. European Union, Brussels, 2014.

[27] POLANSKI, P. P.: Towards the single digital market for e-identification and trust services. Computer Law & Security Review, Vol. 31, No. 6, 2015, pp. 773–781.

[28] ROBIN-OLIVIER, S.: Bargaining in the shadow of free movement of capital. European Review of Contract Law, Vol. 8, No. 2, 2012, pp. 167–183.

[29] RUEDA-CANTUCHE, J. M. et al.: The Single Market as an Engine for Employment through External Trade. In: Journal of Common Market Studies. Vol. 51, Issue 5, 2013, pp. 931-947.

[30] Statute of the The Office of the Deputy Prime Minister of the Slovak Republic for Investments and Informatisation, 2017. Available at «https://www.vicepremier.gov.sk/index.php/o-urade/statut-uradu/index.html» Accessed 27 January 2017.

[31] SZCZEPAŃSKI, M.: A Digital Single Market Strategy for Europe. Tracking European Commission priority initiatives in 2015 – Number 3. European Parliamentary Research Service, 2015. Available at http://www.europarl.europa.eu/RegData/etudes/BRIE/2015/568325/EPRS_BRI(2015)568325_EN.pdf Accessed 23 January 2017.

[32] TERTÁK, E.: The EU internal market for occupational pensions: Making further progress. Pensions: An International Journal, Vol. 15, No. 2, 2010, pp. 140–147.

[33] VAN RIEMSDIJK, M.: Obstacles to the Free Movement of Professionals: Mutual Recognition of Professional Qualifications in the European Union. European Journal of Migration & Law, Vol. 15, No. 1, 2013, pp. 47–68.

ELECTRONIC SERVICES WITH IMPACT ON QUALITY OF LIFE – A SURVEY OF USAGE AND ATTITUDES OF NORTH-WESTERN CROATIAN

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Abstract
Nowadays governmental and non-governmental organizations and private businesses offer a range of electronic services that, if used, directly or indirectly affect quality of life. The supply of electronic services is growing fast, and this growth is expected to continue in the near but also in the distant future. Current generation of digital natives will not know how to live without ICTs and services provided by these technologies. User attitudes towards electronic services and the relationship between their supply and demand are the focus of this paper. Data on demand for and user attitudes towards electronic services were collected on a representative sample of adult population from Northwest Croatia. Participants were interviewed using a measurement instrument created for this purpose. Survey covered usage of electronic services offered by various governmental and non-governmental organizations and private businesses, the nature of user attitudes and the extent to which electronic services are used for the purpose of education, communication, entertainment, employment, improvement of health services and culture. The results show that, on the one hand, participants' demand for electronic services is very poor, while on the other hand their motivation and attitudes towards these services are very positive. Consistently significant differences were found in usage and attitudes toward electronic services by age, level of education and English language fluency. On the other hand, gender, standard of living and urban / rural residence were generally not associated with differences in usage of or attitudes to electronic services.

1. Introduction

In digital revolution era the society is becoming increasingly networked and ICTs serve as one of the primary and critical forces for the improvement of quality of life. OECD Digital Economy Outlook states that, in 2014, 81% of the adult population in the OECD countries' accessed the Internet, and over 75% used it on a daily basis [29, p. 136]. Large number of people are empowered by the new ICT tools, especially through a large number of electronic services offered. ICTs provide people with not only leisure and entertainment, but also with means to improve quality of life in areas of education, communication, employment, commerce, health and culture. Selwyn [34] characterizes the benefits of using ICTs as leading to social and self-understanding benefits, interaction benefits and task-oriented goals. Under self-understanding benefits, he implies, for example, increased access to current social and political affairs or information related to health. Interaction benefits comprise increased networking and social support, while task-orientated benefits include financial management, telework, travel, shopping etc.

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Numerous positive examples have demonstrated that the use of ICTs, and especially electronic services, brings great social benefits, especially to those with lower income, people with low levels of education, the unemployed, older people or those remote from physical distribution points of public services [3,19, 30] . The disadvantaged, in one way or another, are arguably those who would benefit the most from public and private business electronic services, presuming they are familiar with ICTs. Active participation in the information society for such a group of people would result in improvement of social relationships, improvement of job possibilities and, in general, in active participation in all other spheres of society. Therefore, one of the basic government tasks in implementing active policies and strategies related to digitalization and the transformation into an information society is to identify such people and provide assistance in their socialization and integration into information society [20]. Throughout the years, European Commission has, in many policies and programmes [13, 14, 16, 17], emphasized the importance of inclusion of the most sensitive society groups, such as the elderly (called e-ageing), disabled persons (called e-accessibility), ethnical minorities, and/or those living in remote regions (and are subject to the geographical digital divide) in areas such as civic participation (e-government) and public welfare (e-health). Electronic services created for these vulnerable population groups have a potential to improve quality of life in many aspects.

2. Areas where electronic services can improve quality of life

Quality of life is a complex and multidimensional concept and is difficult to define because each discipline (economics, health, psychology, etc.) defines its in own way. All definitions agree in one that the quality of life is higher if people have a happy and satisfactory lives. Through years, research was found that quality of people's life depends not only on the economic prosperity of the national economy and satisfactory material and financial conditions, but also on many other factors. Some of these factors are for example education, health, entertainment, housing conditions, culture, etc. According to the Eurostat report "Quality of life — facts and views" identified areas of quality of life are: natural and living environmen, governance and basic rights, economic and physical safety, social relations and leisure, material living conditions, productive or main activity, health and education [18]. Today's modern civilization places great importance on the quality of life and improvement of quality life. For improvement quality of life an critical role have government of national economies and policies implemented. Nowadays, governments of both developed and developing countries have recognized the importance of electronic services and their potential to improve quality of life, and enhance economic and social growth and development [24, 26, 37]. Nurmela et al. [28] identify seven areas in which ICTs can improve quality of life: personal business from distance, automatic information and process system, mass media and media culture, personal production/self-expression, communication and search for information. The study assumes the following: a) devices make everyday life easier because communication can intensify, diversify and expand beyond temporal and geographic obstacles; b) devices lower the participation threshold because obtaining information is easier and opinions can be expressed through several channels [28]. A similar conclusion was made by Shih and Venkatesh [35] who have also divided the improvement of quality of life of people through the use of ICTs in seven categories: work related, family communication, family recreation, home management, home shopping, education/learning, information centre. In the project "Transformative Use of ICT in EU Regions" Gareis and Lamp [18, p. 45] identified eight areas of activities in which using ICTs improves quality of life: communication and social interaction, perception of information, retrieval of information, personal business, transactions and requests for assistance, entertainment, generation and distribution of user-created content, participation in policymaking and public life, employment-related activities. In an attempt to establish a link between the use of ICT and its positive impact on the quality of life

Amichai-Hamburger and Furnham [2] concluded that as technological devices enter into individual and collective spheres, ICT promotes higher social coherence, the recognition of being a part of a group. Strong attachment within a group/community enhances the members' mutual understanding and social approval and helps to raise the sense of actualization. The impact of electronic services on quality of life of individuals who use ICTs is difficult to isolate and quantify. In this study, we monitor it through the aspects of frequency of use, user attitudes and motivation to use electronic services in the areas of education, employment, communication, government, commerce, entertainment, culture and health.

2.1 Education

Through time, the concept of education has been changing. Nowadays education and lifelong learning are key factors and the basis for inclusion in the information society. A growing array of educational electronic services offer opportunities for lessons individually adjusted to the student's needs in ways that the classic way of teaching never could [36]. In his empirical research, Van Dijk [38] shows that the use of ICT has positive effects on learning and cognitive development through interactive learning styles, by supporting new multimedia ways of presenting information. Surprising fact, according to the OECD Digital Economy Outlook 2015 [29], is that the majority of students use computer for practicing and drilling sessions once or twice a month, and that percentage of students using computers for this purpose on a daily basis, for example, in Denmark is around 12%, in Norway 10%, and only 2% in Germany and Finland. The same report states that online opportunities for professional development, such as massive open online courses (MOOCs) are underutilized. In European Union in 2013 around 7.8% of Internet users attended online courses, although this percentage varied from 16% in Finland to less than 3% in the Czech Republic [29, p. 142, 143].

2.2 Employment

Opportunities for learning offered by the Internet eventually contribute to increase in employability and better salary prospects in the labour market. The opportunities for a satisfactory working life are reflected in an important ICT trend, nowadays termed e-employment. The concept of e-employment comprises broadband connection between job seekers and employers worldwide, videoconferencing, remote training and other forms of home-based or mobile-based teleworking. Electronic services in this area enable effective job searching, increase employability and business start-up [6]. According to Drever and Hoffmeister [9], the extent to which an individual is able to establish diverse social connections can be an important factor in their successful incorporation into the labour market.

2.3 Communication

Social relations are very important for the functioning of individuals and society as a whole. During the larger part of the 20th century, most communications were face to face, via telephone or through physical mail. Quantity and speed of information exchange were limited by geography, technology and cost. Today Internet increases opportunities related to communication and ICTs are increasingly becoming ubiquitous. Internet service most commonly used for communication is e-mail. OECD [22, p. 139] reported that during 2013-2014, on average, 87% of Internet users sent e-mails. Communication services are still constantly evolving. Today's technology enables affordable textual, audio and/or visual communication in real time through Internet services like Google Voice, Skype, WhatsUpp, Viber etc. Social networks provide individuals with an

opportunity to establish new or enhance old contacts and create and maintain connections with various social groups and organizations [30]. The evolution of communication, among other things, offers easy access to broad audience. Web 2.0 applications, like forums and blogs, enable users to create their own digital communication objects. Access to mass communication enabled that new ICT and Internet technologies have created stronger connection between commerce, banking, entertainment and communication area.

2.4 Government

Electronic services also play a considerable role in simplifying interactions between citizens and public authorities thanks to the digitalization and automatization of many processes. The overall share of citizens that use Internet to perform administrative procedures has increased in recent years. However, still not sufficiently, as confirmed by the OECD report [29, p. 51 that states that, on average, only 35% of users in OECD countries use e-government services. ICTs likewise enable individuals to engage in collective behaviour and form social movements [1, 6, 29].

2.5 Commerce

Electronic services offer consumers access to global network of suppliers and in this manner, expand the degree of consumer choices. With a wide range of search engines and price comparison sites, consumers can also reduce the time and cost spent finding goods and services. Increased capacity for consumers to find and compare products not only increases efficiency of matching customers and sellers, but also drives up price competition which can also lead to significant monetary savings. In order to satisfy the wishes and needs for products and services, electronic services provide great benefits for consumers in terms of accessing information about products and services from any part of world, as well as the possibility of purchasing them. Research conducted by the OECD shows that over 2013-2014, on average, 82% of customers in OECD countries used the Internet to obtain information on goods and products, 58% of them ordered products online, while only 21% sold products over the Internet [29, p. 139]. E-banking is one of the most successful services in e-commerce with an increasing number of users every year. As an example, according to OECD in 2013, 60% of Internet users in OECD countries used online banking, up from 42% in 2011 and 31% in 2007 [29, p. 55].

2.6 Entertainment

The area where electronic services play a major role in improving the quality of life nowadays, especially for the younger population, is entertainment, specifically called e-entertainment. According to Ronchi [33, p. 9], "e-entertainment involves supplying digitalized entertainment products and services which entertain the users in a variety of languages and in line with diverse cultures, supporting data transfer, interactive entertainment of synergy between analogue and digital platforms". Various forms of electronic services and tools are available for the purpose of entertainment, while the types of electronic services in the field of e-entertainment that are most commonly used nowadays are social networking (Twitter, YouTube, Instagram, Facebook), content download (movies, music, etc.), music players, on-line gaming, etc. [4]. According to PricewaterhouseCooper Consulting, research revenues from digital entertainment are continuously growing and they forecast that by the 2018 65% of global entertainment and media growth – almost two in every three extra dollars – would be from digital entertainment [32].

2.7 Culture

Use of electronic services has caused major changes in the area of culture. Borders no longer exist and the culture and cultural events have now become accessible to all. Still, ICTs are continuously changing the methods of consumption of cultural products. Ubiquitous digitalization has enabled access and distribution of large amounts of cultural information to many users regardless of time and place. Virtual museums provide access to cultural heritage located in remote or difficult accessible museums. Locating literature on any topic is facilitated through online search of a library catalogue or access to a digital library where content is available in digital form. Artwork of the world's most renowned artists can be viewed and studied from home through digital galleries. All of the above can be summarized by the concept of e-culture or digital culture. According to Ronchi [33, p. 9] e-culture "involves preserving and presenting cultural heritage in line with the challenges of the future, exhibiting valuable cultural assets clearly and informatively using state-of-the-art technology".

Due to high availability of information that Internet provides, people can share knowledge, explore and better understand other cultures. In other words, Internet contributes to the creation of an umbrella cosmopolitan culture necessary for communication among people from disparate cultures [22]. In the European Union "digitisation and online accessibility of cultural material and digital preservation" are among political priorities. European Commission supports digital culture through open coordination of member states activities and provision of European Structural and Investment Funds [11, 15]. Already there is a large supply of applications and tools, interactive information systems with user friendly navigation techniques, virtual reality methods and various multimedia tools and services for easier retrieval and better presentation of digital cultural contents to the users.

2.8 Health

One of the most outstanding benefits of implementation of electronic services is in the field of health care. Owing to ICTs health care practitioners can remotely assist or monitor vital parameters of patients anywhere and anytime. Assistive technologies play an important role in health care. E-health and a large number of aforementioned assistive technologies that are already available are the response to critical social challenges at significantly reduced social cost [10]. Many studies report on benefits of ICT and assistive technologies for the elderly and people with disabilities. These technologies enable target groups to reach autonomy, and maintain dignity and independent living [21, 25, 27]. To summarize, one can conclude that use of electronic services gives people a wide variety of choices and opportunities enabling them to get the kinds of products and services that best fit their desires and needs.

3. Research design and methodology

The main part of the survey was conducted on a representative sample of 427 adults (18+ years) from two counties in Croatia (Varaždin and Međimurje County). The sample was designed as a proportionate stratified random sample from the list of households maintained by the Croatian Bureau of Statistics originating from the 2011 Census of Population, Households and Dwellings in The Republic of Croatia. Fieldwork was carried on during December 2014 and January 2015 and comprised face-to-face oral interviews conducted by eleven qualified interviewers. We have developed a measurement instrument (a questionnaire) comprising 78 items related to digital economy (25 items), e-learning (6 items), e-health (17 items), e-government (15 items), e-culture, e-communication and e-entertainment (15 items). Items were coded on a 5-point semantic ordinal

scale. Response labels for items measuring user attitudes ranged from "1-strongly disagree" to "5-strongly agree", and those for measuring service usage ranged from "1-not at all" to "5-very frequently". These 78 items were supplemented with socio-demographic data on participants' age, gender, place of residence, employment status and infrastructure indicators.

Qualitative and quantitative content validity of the measurement instrument were assessed by a panel of experts from Croatia and Austria. Qualitative content validity assessment resulted in recommendations on format and choice of items (e.g. selection and order of words, etc.). Quantitative content validity was assessed based on Content Validity Ratio (CVR) and average value of relative importance. For the purposes of quantitative validation, questionnaire was piloted on a convenient sample of participants contacted by electronic mail, social network (Facebook) and the e-learning system of Faculty of organization and informatics. The data collection period via an online survey lasted three months, i.e. from June to September 2014. Even though 331 respondents initiated the online survey, there were only 197 complete responses that were retained for the analysis. Assessment of construct validity of measuring instrument (questionnaire) was based on exploratory factor analysis using maximum likelihood method with orthogonal Varimax rotation and Keiser normalization. We used Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity to assess sampling adequacy [21]. Fit of the model was independently evaluated with the percentage of nonredundant residuals with absolute values grater then 0.05 [8]. Internal consistency was determined by Cronbach's alpha.

In addition to standard descriptive statistics, ANOVA was used to test whether there were any differences in factor scores for usage and attitude by age, gender, household standard of living, household structure, level of education, place of residence, employment status and English language fluency. Since there were 64 comparisons we also used Benjamini & Hochberg's correction to control the false discovery rate [5].

4. Results

4.1 Validity of the measuring instrument

Following the qualitative and quantitative content validity analysis, 10 items were reformulated and 41 items were excluded thus reducing the number of items from 78 to 37. Kaiser-Meyer-Olkin measure of sampling adequacy (KMO = 0.755) and Bartlett's test of sphericity ($\chi 2 = 2237.524$, $df = 300$, $p < 0.0005$) both confirmed that assumptions for exploratory factor analysis were met. Number of non-redundant residuals >0.05 in absolute value was 10 (3,0%) confirming that the model represents data well. We have retained 8 factors that accounted for 73.34% of total variance. Number of manifest variables was further reduced from 37 to 25. Table 1. shows Cronbach's alpha coefficients for subscales of the measurement instrument. All subscales had satisfactory reliability.

FACTOR	CRONBACH'S ALPHA
FACTOR 1 – e-learning	**0.823**
FACTOR 2 – e-health (usage)	**0.822**
FACTOR 3 – e-government	**0.878**
FACTOR 4 – e-health (attitude)	**0.835**
FACTOR 5 – e-culture	**0.753**
FACTOR 6 – e-entertainment	**0.704**
FACTOR 7 – e-employment	**0.801**
FACTOR 8 – e-banking, e-commerce, e- communication	**0.625**

Table 1: Cronbach's alpha coefficients for 8 subscales

4.2 Usage and attitudes towards electronic services

In the main part of the survey, 427 respondents participated voluntary in the research and have completed the questionnaire. There were 185 (43.3%) male and 242 (56.7%) female participants. The greatest portion consisted of participants aged between 45 and 54 years (76, or 17.8%) and the smallest portion of participants were participants with age 75 years and older (36, or 8.4%). Majority of participants (228, or 53.4%) are from a rural area, 116 (27.2%) of respondents live in an urban and 83 (19.4%) in a suburban area. Large majority (299, or 70.0%) of respondents use fixed Internet access at home, and 179 (41.9%) use mobile Internet access. More than 80% (353 respondents) own a mobile device, 219 (51.3%) have a laptop and more than 50% of all respondents stated they own a desktop computer. Respondents use ICTs for educational purposes fairly little. More than three quarters (327, or 76.6%) of respondents declared they "do not at all" or "very rarely" use ICTs for information search about educational courses. Only 48 (11.2%) respondents do it "frequently" or "very frequently". Similar results were obtained for use of ICTs to access and download materials for education/training (311 or 72.8% "very rarely" or "not at all", 22 or 5.2% "very frequently"). Only 30 respondents (7.0%) attend online educational courses "frequently" or "very frequently", while 287 (67.2%) respondents declared they do it "not at all".

In Croatia, e-health services (factors 2 and 4) have been available for several years but the frequency of use is quite low, similar to e-education services. Thus, for example, only 55 (12.9%) respondents "frequently" or "very frequently" use Internet to obtain a second opinion regarding diagnosis and health status for friends or family members, while 325 (76.1%) have used it for this purpose "never at all". Only 23 (5.4%) respondents "frequently" or "very frequently" use Internet to get a specialist examination or surgeries, while 337 (78.9%) have never used these services. A very small number of respondents (75 or 17.6%) use Internet "frequently" or "very frequently" for information search to improve their health, while 286 (67.2%) have "never used" or use it "very rarely". Use of Internet to search for information about medicines or to buy medicines is also poor. 317 (74.2%) respondents declared to have "never" or "very rarely" used Internet for this purpose, and only 52 (12.2%) respondents stated they use it "frequently" or "very frequently". However, examining the attitudes concerning the fact that e-health increases the quality of health services (36.30%), saves time (38.18%) and is more cost acceptable (38.40%), if compared to the alternative traditional ways, the majority of respondents' attitude is positive. Whereas regarding the claim "I would recommend the use of e-health care to other users", more than 55% of respondents have either a positive or negative opinion which can be explained by the aforementioned low frequency of use of this type of service.

The results for e-government (factor 3) show that the respondents who participated in this survey have positive attitudes toward the need for creating new governmental e-services. Thus 286 (67.0%) respondent agree that electronic services should be used for applications related to land registry, cadastre, and building permits, 276 (64.6%) agree with using electronic services for birth and citizenship certificates, and the same number agree with using electronic services for requesting marriage certificates. The same number of respondents also "agree" or "strongly agree" that there should be electronic services for requesting passports, driving licenses, identity cards and other documents. Positive attitude (265 or 62.1% of respondents) is also connected to the claim "I believe that the filing tax return forms should be enabled by using ICT and the Internet.", and 281 (65.8%) respondents agree that ICTs should be used for residence registration.

Respondents practically do not use ICTs for e-culture (factor 5). As many as 350 (82.0%) respondents do not use ICTs to watch theatrical performances, and 34 (8.0%) use them very rarely. Even more respondents (401 or 93.9%) do not "visit museums online. A surprising fact is that only 38 (8.9%) respondents read / download digital books "frequently" or "very frequently".

Surprisingly, even for e-entertainment (factor 6), usage of electronic services is very low. Very large number of respondents "rarely" or "very rarely" use ICTs to: "read online newspapers, magazines..." (242 or 56.7%), "listen / download music" (279 or 65.3%), "watch / download movies" (305 or 71.4%), "watch TV shows" (363 or 85.0%) and "listen to radio station" (369 or 86.4%).

A very low usage of ICTs for employment purposes (factor 7) was also observed. Number of respondents who "do not" use, use "rarely" or "very rarely" ICTs "to find information about employment" was 368 (86.2%), "to send job applications" was 396 (92.7%) and "to log on portals for employment services" was 386 (90.4%).

Factor 8 comprises e-commerce, e-banking and e-communication. Again, a small number of respondents use ICTs for "online shopping" (92 or 21.5%) or "to buy / book tickets (concerts, theatre, exhibitions)" (32 or 7.5%). Slightly larger number "search information on desired products and services" (157 or 36.8). E-banking is one of the most popular e-services in the area of e-commerce, still 295 (69.1%) respondents stated they "do not" use it, or use it "rarely" or "very rarely". E-mail is used as a form of communication "frequently" or "very frequently" by only 165 (38.6%) respondents, while social networks (e.g. Facebook, Twitter...) are used "frequently" or "very frequently" by 138 (32.3%) respondents.

4.3 Variation of factor scores in relation to socio-demographic characteristics

We used ANOVA to compare mean factor scores across levels of eight socio-demographic variables. Results are summarized in Table 2.

	Factor scores							
Socio-demographic factors	I	II	III	IV	V	VI	VII	VIII
Gender (df1=1; df2=425)	NS	NS	NS	NS	NS	*	NS	*
Household standard of living (df1=4;df2=422)	NS	NS	NS	NS	NS	*	*	**
Age (df1=6;df2=420)	***	***	***	*	***	***	***	***
Household structure (df1=1; df2=420)	***	**	*	NS	***	***	***	***
Level of education (df1=6;df2=420)	***	***	***	***	***	***	***	***
Place of residence (df1=2; df2=424)	**	NS	NS	NS	NS	NS	NS	NS
Employment status (df1=6; df2=420)	***	**	***	NS	***	***	***	***
English language fluency (df1=5;df2=421)	***	***	***	***	***	***	***	***

Legend:
* p<0.05 ** p<0.01 *** p<0.001
Factors: I – e-learning, II – e-health (usage), III – e-government, IV – e-health (attitude), V – e-culture, VI – e-entertainment, VII – e-employment, VIII - e-banking, e-commerce, e-communication

Table 2: Summary of the results of ANOVA for eight factor scores (sub-scales) by socio demographic factors, with Benjamini & Hochberg's correction for false discovery rate [5].

Only for factors 6 and 8 (e-entertainment and e-commerce) was there a significant difference in factor scores between genders, with higher average scores in males. When it comes to standard of living, significant difference among the 5 levels of standard were found for factors 6 to 8. E-entertainment and e-commerce followed the same pattern of higher scores for higher standard of living, while e-employment showed the opposite trend. Differences in mean factor scores among age groups are significant for all factors. In general, there is a trend of decrease in mean factor scores with growing age. For factors 3 (e-government) and 8 (e-banking, e-commerce, e-communication) the youngest age group (18-24 years old) shows slightly lower mean factor scores than the second age group (25-34 years) with decrease in factor scores for older groups. Factor 4 (attitude towards e-health) shows steady level for younger to middle age groups (up to 54 years) and then starts decreasing, like other factor scores. Differences in factor scores among groups defined by household structure are significant for all factors except factor 4 (e-health attitudes). For all these factors, higher factor scores were observed in households with children. All factors exhibit significantly higher factor scores in groups with higher levels of education. Only for e-learning usage was there a significant difference among places of residence, with urban population showing higher usage than suburban and rural populations. Only for factor 4 (e-health attitude) there was no significant difference in mean factor score by employment status. For all other factors except e-employment (factor 7) there was a similar trend of increase in factor scores from retired people, to unemployed, fully employed, with maximum mean factor score for students. For e-employment (factor 7) the highest mean score was observed in those with temporary part-time jobs, followed by unemployed and students. All factor scores increase significantly with higher level of English language fluency.

5. Summary and conclusion

Our aim was to study citizens' attitudes to and usage of e-services in eight areas that have a significant impact on quality of life: economics, education, employment, health, government, culture, communication and entertainment. Usage of ICTs for education, employment, health and culture was very low. On the other hand, in economics, communication and entertainment, ICTs were most often used to search for information about products and services. Online shopping is still not preferred by as many as 78.0% of respondents. Usage is slightly better in e-entertainment with 34.7% of the respondents using ICTs frequently or very frequently for listening/downloading music,

28.6% for watching/downloading movies, but less than 15.0% of respondents use it for listening to radio stations and watching TV shows. While e-mail is used for communication very rarely by 54.1% of respondents, 60.7% do use social networks (such as Facebook, Twitter, etc.). The least often used electronic services were shopping and booking of tickets for concerts or theatre shows (only 7.5% of respondents do it frequently or very frequently). General attitude toward e-health services was undecided with majority of the respondents having neither positive nor negative opinion, or else not having an opinion at all. This can be explained by extremely low usage of e-health services. Respondents' attitudes toward development of new e-government services was generally positive. According to information published on the central e-government portal this is in line with long term plan of Directorate for e-Croatia of the Ministry of Public Administration. Citizens in Croatia have generally positive attitude concerning e-services, even though usage is very poor. Age, level of education, and English language fluency were the most significant determinants of factor scores for usage and attitude subscales. Household structure and employment status were associated with differences in usage and attitudes for all subscales except those for e-health. On the other hand, gender, standard of living and rural vs. urban residence did not in general significantly determine factor scores of usage and attitudes subscales.

Results point to high level of availability of fixed and/or mobile access to Internet, and mobile devices in studied population. Even though attitudes to use of electronic services are generally positive, usage is still very low. The most important barrier to increased usage seem to be lack of digital literacy, as level of education, age and English language fluency were the most significant determinants of usage and attitudes. We would recommend the Government to introduce informatics as an obligatory subject in primary and secondary education and organize free or affordable workshops on use of Internet services for general population (especially the elderly). Additionally, promotion of available services through newspapers, public television, and other forms of marketing could improve citizens' motivation to use electronic services.

6. References

[1] ALI, A. H.: The Power of Social Media in Developing Nations: New Tools for Closing the Global Digital Divide and Beyond. Harvard Human Rights Journal, 24, 2011, 185-219.

[2] AMICHAI-HAMBURGER, Y. and FURNHAM, A.: The positive net. Computers in Human Behavior, 232, 2007, 1033-1045.

[3] BANKOLE, F. O., SHIRAZI, F. and BROWN, I.: Investigating the impact of ICT investments on human development. The Electronic Journal of Information Systems in Developing Countries 48 8, 2011, 1-19.

[4] BENEDETTO, S., CORREIA, L. M. and LUISE, M.: The Newcom++ Vision Book. Springer, Berlin, Heidelberg, 2012.

[5] BENJAMINI, Y. and YEKUTIELI, D.: The control of the false discovery rate in multiple testing under dependency. *Annals of Statistics* 29, 2001, 1165–1188.

[6] CODAGNONE, C., CILLI, V., BIAGI, F., FOLEY, P. and DE LUCA, A.: Inclusive Innovation for Growth and Cohesion: Modelling and demonstrating the impact of eInclusion. European Commission, Directorate-General for Communications Networks, Content and Technology, Bruxelles, 2009. DOI 10.2759/51002.

[7] CONROY M., FEEZELL, J. T. and GUERRERO, M.: Facebook and political engagement: A study of online political group membership and offline political engagement. Computers in Human Behavior, 28, 2012, 1535–1546.

[8] CURETON, E.E. and D'AGOSTINO, R.B.: Factor analysis: an applied approach, Psychology Press, New York, 2009.

[9] DREVER, A. I. and HOFFMEISTER, O.: Immigrants and social networks in a job-scarce environment: The case of Germany. International Migration Review. 42, 2, 2008, p. 425-448.

[10] ECCLES, A., DAMODARAN, L., OLPHERT, W., HARDILL, I. and GILHOOLY, M.: Assistive Technologies: Ethical Practice, Ethical Research, and Quality of Life, in: Technologies for Active Aging. Springer US, 2013, 47-68.

[11] EUROPEAN COMMISSION. e-Health—making healthcare better for European citizens: An action plan for a European e-Health area. COM (2004) 356 final. Brussels. 30 April, 2004.

[12] EUROPEAN COMMISSION (EC). Digital Culture. Access to and preservation of cultural heritage, Brussels, 2004.

[13] EUROPEAN COMMISSION (EC). Towards an accessible information society. COM (2008) 804, Brussels, December 2008.

[14] EUROPEAN COMMISSION (EC). The Active and Assisted Living Joint Programme (AAL JP) 2013-2020, https://ec.europa.eu/digital-single-market/node/50829, 10.11.2016.

[15] EUROPEAN COMMISSION (EC). Implementation of Commission Recommendation on the digitisation and online accessibility of cultural material and digital preservation Progress report 2013-2015, Brussels, 2016.

[16] EUROPEAN COMMISSION (EC). The European eGovernment Action Plan 2011-2015. Harnessing ICT to promote smart, sustainable & innovative Government, COM(2010) 743 final, Brussels, 2010, 10.11.2016.

[17] EUROPEAN COMMISSION (EC), Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions: EU eGovernment Action Plan 2016-2020 Accelerating the digital transformation of government (COM(2016) 179 final), Brussels, April 2016.

[18] EUROSTAT, Quality of life in Europe — facts and views, 2015, http://ec.europa.eu/eurostat/documents/3217494/6856423/KS-05-14-073-EN-N/, 19.03.2017.

[19] GAREIS, K. and LAMP, H.: WP2: Indicators on Transformative Use of ICT– D2.1 Indicator Stocktaking Report, 2007, http://www.transform-eu.org/publications/documents/D2.1.pdf, 02.11.2016.

[20] HANNA, N. K.: An ICT-Transformed Government and Society. In: Transforming Government and Building the Information Society, Springer, New York, 2011, 1-25.

[21] HARDEY, M. and LOADER, B.: The Informatization of Welfare: Older People and the Role of Digital Services. British Journal of Social Work. 39, 2009, 657–669.

[22] HONGLADAROM, S.: Global Culture, Local Cultures and the Internet: The Thai Example. Ai & Society.13, 4, 1999, 389-401.

[23] HUTCHESON, G. and SOFRONIOU, N.: The multivariate social scientist. Sage. London. 1999.

[24] KOZMA, R. B.: National policies that connect ICT-based education reform to economic and social development. An Interdisciplinary Journal on Humans in ICT Environments. 1, 2, 2005, 117-156.

[25] LOADER, B. D., HARDEY, M. and KEEBLE, L.: Health informatics for older people: a review of ICT facilitated integrated care for older people. International Journal of Social Welfare. 171, 2008, 46–53.

[26] MADON, S.: The Internet and socio-economic development: exploring the interaction, Information Technology & People, 13, 2, 2000, 85-101.

[27] MORT, M., ROBERTS, C., POLS, J., DOMENECH, M. and MOSER, I.: Ethical implications of home telecare for older people: a framework derived from a multisited participative study. Health Expectation Health Expect. 8, 3, 2013, 438-49.

[28] NURMELA, J., PARJO, L. and SIRKIÄ T.: From Citizen to eCitizen. Results from Statistical Surveysabout Finns Use of ICT 1996-2005, 2004.. Reviews 2006/3, Helsinki: Statistics Finland, 2004.

[29] OECD, OECD Digital Economy Outlook 2015, OECD Publishing, Paris, 2015. DOI:10.1787/9789264232440-en.

[30] OSATUYI, B.: Information sharing on social media sites. Computers in Human Behavior. 29, 2013, 2622–2631.

[31] PEREIRA, G. C., ROCHA, M.C.F. and POPLIN, A.: e-Participation: Social Media and the Public Space. B. Murgante et al. (Eds.): ICCSA 2012, Part I, LNCS 7333. Springer-Verlag Berlin Heidelberg, 2012, 491–501.

[32] PWC, Global entertainment and media outlook 2014-2018, Annual Global CEO Survey, 2014.

[33] RONCHI, A. M: eCulture: cultural content in the digital age. Springer Science & Business Media. New York, USA, 2009.

[34] SELWYN, N.: Reconsidering political and popular understanding of the digital divide. New Media & Society, 6, 2004, 341–362.

[35] SHIH, C.-F. and VENKATESH, A.: Beyond Adoption: Development and Application of a Use-Diffusion Model. Journal of Marketing. 68, 1, 2004, 59-72.

[36] SVENDSEN, L., P. and MONDAHL, E., M.: How social-media enhancedlearning platforms supportstudents in taking responsibilityfor their own learning. Journal of Applied Research in HigherEducation. 5, 2, 2013, 261-272.

[37] TAS, E. M: ICT education for development – a case study. Procedia Computer Science. 3, 2011, 507–512.

[38] VAN DIJK, J.: The network society. Social aspects of new media.Thousand Oaks. CA: Sage. London, UK, 1999.

A NEW REVOLUTION: DATA REVOLUTION (THE FIRST STEPS OF MOLDOVA)

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Abstract
The new Agenda 2030 for sustainable development universally adopted by the UN in 2015 with the 17 Sustainable Development Goals (SDGs) aims to fight poverty, inequality and climate change. It requires collective action at all levels, more evidence-based development policy-making, better availability of quality data and statistics, and strengthened accountability of development stakeholders, requiring in other words a "Data Revolution for Sustainable Development". At the moment, Republic of Moldova is in process of nationalizing the SDGs with the support of UNDP.

Since data revolution represents the process of monitoring the progress and response to SDG challenges, Moldova was part of a global initiative undertaken in 7 different countries, for mapping and inventory of the data system in each country, required for measuring the sustainable development progress. Its overall objective was to assess the availability of data and institutional modernization capacity needed to implement the post-2015 development agenda. The paper presents the steps undertaken in Moldova for mapping the situation for future localization/adaptation of SDGs to ensure their monitoring in order to achieve the post-2015 Agenda using ICT tools.

1. Introduction

1.1 Global context: Need for Data Revolution

The new global post-2015 Development Agenda „*Transforming our world: the 2030 Agenda for Sustainable Development"* was adopted at the 70th session of the United Nations (UN) General Assembly in September 2015 by 193 countries. The Agenda includes a new set of 17 global development goals to transform the world – the Sustainable Development Goals (SDGs) and 169 targets [13].

The UN High-Level Panel of Eminent Persons on the post-2015 agenda has called for a "data revolution for sustainable development, with a new international initiative to improve the quality of statistics and information available to citizens" [1]. Data are the lifeblood of decision-making and the raw material for accountability. Without high-quality data providing the right information on the right things at the right time; designing, monitoring and evaluating effective policies becomes almost impossible [2].

As stated in the National Report of Moldova [10], data revolution may be defined as the analysis and decision-making process for the sustainable development of the society and the world, by using the existing data sources, as well as attracting other data sources and promoting free access to these sources. Data Revolution can be carried out by stakeholders who have responsibilities with regard

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to data (called "data communities") and which interact with each other through various institutions, with effective enforcement of laws and policy framework and the use of innovative technologies, thus creating a "data ecosystem" [11]. To support a coordinated and coherent process concerning the implementation of the SDGs worldwide, a framework for monitoring and evaluating the progress, having established targets and indicators for each objective has been developed. The monitoring process requires commitment from the authorities, respectively from the community in general, and the existing capacity to collect process and use the data by each country [5].

New technologies and new platforms for gathering and bringing data together, new stakeholder partnerships and new ways of using data by analysts, policy makers, businesses and citizens are the main characteristics of data revolution [6]. These new instruments and approaches are built on ICT-based tools that serve as an important platform for implementation of SDGs and for monitoring progress toward their achievement [7].

1.2 Country context: Need for data ecosystem mapping and applied methodology

The Post-2015 Agenda believes that the support and expertise from academia, private sector and civil society, encouraging innovation as an approach and/or instrument in producing statistical data is a critical element for strengthening national statistical offices for the revolutionary use of data and exploring new technologies and innovative approaches [3]. Beside this fact, the main goal of using data in an extensive way is the evidence-base decision making process for the development of society. In this context, it is considered useful and necessary for each UN member country to conduct a mapping of the data ecosystem describing the current situation and submitting a needs analysis for the achievement of a data revolution, as an essential element in the decision-making process [12].

UNDP Moldova has launched an activity, as part of a global initiative undertaken in 7 different countries, for mapping/inventory of the data system in the country, required for measuring the sustainable development progress. Its overall objective was to assess the availability of data in an inclusive and participatory manner and institutional modernization capacity needed to implement the Post-2015 Agenda in the Republic of Moldova, the structure and stakeholders' involvement, the use and importance of data and the mechanisms employed in the decision-making process [8].

The chosen *methodology* for the mapping was oriented towards identifying ways of obtaining statistical data for purposes of needs assessments and towards raising awareness of the responsibilities carried by stakeholders involved both in sustainable development and developing evidence-based policies, or in other words, in supporting "Data Revolution for Sustainable Development". The "desk review" method was used for assessing the SDGs preliminary applicability / feasibility for Moldova by examining and analysing the availability of indicators assigned to each SDG in the national statistical system.

Further undertaken activities (workshops, analysis by questionnaires) aimed at capturing the perspective, experiences and challenges of these categories of institutions/stakeholders regarding data use or production and identifying synergies and opportunities for collaboration among them.

The analysis was conducted from the perspective of:

a) availability and functioning of the normative framework on the production of official statistics, data processing and data use in decision making;

b) availability & operability of the information and communications technology (ICT) tools and systems;

c) observing and identifying the capacity in terms of human resources involved in producing the data and the need for training for data use;

d) the availability of organizational and financial resources for the data production process; and

e) identifying and emphasizing innovative ideas and solutions suggested by the data communities for monitoring and evaluating the implementation of Sustainable Development Goals.

The mapping results are reflected in the National Report: Data Revolution Ecosystem Mapping in the Republic of Moldova [10].

2. Mapping Process Results

The mapping of data ecosystem started with the desk review of national development strategies and plans, progress reports on their implementation, as well as monitoring and evaluation activities in collaboration with civil society, academia, private sector and citizens. The overview on the state of the art of data ecosystems was undertaken in line with international best practices on Data Revolution.

A preliminary inventory of statistical indicators available at the national level, produced by the National Bureau of Statistics (NBS) and other data producers and their comparison with the 230 SDG indicators published by the UN Economic and Social Council was undertaken. Along with the identification of the authority responsible for data collection for each indicator, the data source for both available and missing indicators has been identified, as well as reconfirming or identifying the relevant stakeholders that could participate in monitoring the SDGs implementation.

At first glance, the analysed strategic documents show that Moldova in general, has anchored the long-term development objectives (see “Moldova 2020” [9]) to the Millennium Development Goals (MDGs). This approach allowed a certain correlation of monitoring and evaluation, by defining the indicators and the reporting process of progress, on the one hand with the basic document - “Moldova 2020”, and the subsequent sectoral strategies, on the other hand.

The mapping process involved the preliminary analysis of the availability/applicability in the national strategic documents of SDG targets (169 targets) and indicators (230 indicators). Compared to national specificities, it was found that all SDGs in principle are applicable for Moldova. When referring to SDGs indicators, 211 of the total of 230 SDG indicators were considered relevant at this stage. These relevant indicators were identified per the following groups: Social, Economic, and Civil Rights & Governance. The evaluation of data availability per areas and stakeholders, enables observing the distribution by types of data producers and owners, and also from the perspective of the monitoring and evaluation process. Out of 211 SDG indicators identified as applicable to Moldova, most are found in the Social area (69 indicators) and the Civil

Rights & Governance area (56 indicators). Moreover, 70 indicators (33%) are fully available and 141 indicators (67%) are considered partially available or missing. However, referring to the availability of indicators, it was found that most data collection efforts should be directed towards areas of Energy & Environment and Civil Rights & Governance (Table 1).

Domain/Indicators	SDGs considered indicators	Integrally available indicators	Partially or totally missing indicators
Social	69	32	37
Economic	39	16	23
Energy & Environment	47	10	39
Civil Rights & Governance	56	12	44
Total	**211**	**70**	**141**

Table 1: The availability of indicators by area [10]

The analysis revealed a relatively balanced distribution of indicators in the 4 considered areas and the inventory enabled the identification of indicators by category of data producers in the national institutions. The analysis was further expanded to resources needed for the data revolution: legal framework and procedures, human resources and skills, ICT infrastructure and financial resources. An important component of mapping SDGs is assessing the position of central public authorities with reference to the data ecosystem. In this context, for each indicator were identified both the institution responsible for its collection and production, and those responsible for monitoring and evaluating the strategic framework with reference to specific indicators.

Overall, the data community can be divided into 3 distinct categories: data producers, data owners and data users. The mandate and commitment to data of each data community participant, including visions and requirements are defined according to these categories. However, some entities which have responsibilities related to data may be found simultaneously in several categories, which increases their role in the national data ecosystem.

The mapping shows that in all SDG incumbent indicators, relevant for Moldova, the leading producer of indicators is the NBS, which is responsible for producing 46 indicators, of which 19 in the economic area, 19 in the social area, 5 in the environmental and energy area and 3 in the rights and governance area. It is followed by the National Centre of the Ministry of Health, which is responsible for producing 14 SDG incumbent indicators. The leadership on the analysis and monitoring of SDG related indicators falls under the Ministry of Health, which has responsibility under 30 indicators, of which 25 indicators in the social area, followed by the Ministry of Labour, Social Protection and Family (28 indicators) and the Ministry of Economy (27 indicators).

Analysis of data availability by areas and stakeholders makes it obvious that a large number of SDGs indicators (150) are in the possession of data holders or the institutions responsible for monitoring and evaluation of SDGs (148), as compared to indicators in the possession of data producers (90), which should eventually lead to a distribution of tasks and efficient use of resources in the process of SDGs implementation, monitoring and reporting.

Considered indicators for all areas covered by SDGs can be determined and measured in Moldova by using all known sources, including: selective household research/ population studies; population and housing census, agricultural census; administrative data (registries, databases, internal records for a

particular purpose); data on civil status, vitality statistics (births, deaths, marriages, divorces, etc.); geospatial data (data on geographical location, natural or constructed features of objects, their limits in a given area). The availability of these sources and the statisticians' experience in their use can be considered important advantages for building the administrative capacity to develop official statistics. With the assumption of SDGs, Moldova is to make major efforts in filling the missing indicators, as well as in disaggregation of those considered relevant at the national level. Another important aspect is the need to delineate, at the stage of nationalization, the role of each institution responsible for producing and reporting SDG indicators. The efficient resource channelling should consider delegating some responsibilities specific to data processes to a single institution, so as to avoid the duplication of certain activities and reduce the reporting burden.

The use of data in decision making still remains a great challenge, and in this sense one of the major issues is data quality, which refers not only to accuracy, but also to the availability, completeness, relevance, validity and actuality. In terms of ICT infrastructure, especially in ensuring access and connectivity, Moldova is in principle ready for monitoring SDG indicators, thus being able to carry a data revolution. Along with the decrease of urban-rural, regional-central existing gaps, the process will become comprehensive and effective.

Most sectoral strategies and plans developed by the government and public authorities addressed the country targets generally related to MDGs. However, even though the strategies have a monitoring and evaluation framework that includes the result indicators, they are defined at insufficient level related to those suggested for SDGs. It would be necessary in the immediate future to correlate the national strategies' targets with SDGs and to review the monitoring and evaluation framework, by harmonising and adapting the proposed SDG indicators as much as possible for local situation, but also ensuring the openness of public authorities for partnerships with stakeholders in the collection, processing (academia, private sector, local government, civil society) and involvement in public policy adjustments for the SDGs performance indicators. Among the evaluated strategies "The Republic of Moldova Innovation Strategy for 2013-2020" can be highlighted as an example of monitoring and evaluation framework with clear baseline and impact indicators, intermediate and final indicators, mostly defined according to international organizations' practices (e.g. the World Bank).

The main stakeholders identified for the SDGs process include the State Chancellery, National Bureau of Statistics, Ministries and public agencies, E-Government Centre, local public administration, academia, civil society, international donors, private sector representatives. The needs analysis of data communities and the assessment of the state of play regarding the availability of data for monitoring the implementation of SDGs was conducted by applying / delivering and filling in a questionnaire dedicated to target respondents (in the identified data communities).

The consultation process has been backed up at State Chancellery level, which officially advised on SDGs, mapping process and data revolution and guided all public authorities in the country in filling in the *questionnaire*, whether on-line or off-line. Questionnaires were filled in over 15 days by 118 organizations/institutions. Based on the survey results, the availability of information for the public on data collection and dissemination conditions requires more concerted efforts. Due to the legislation on personal data protection that is in force, data producers and owners started paying greater attention to issues related to data privacy, personal data processing, informing the public about these issues etc. However, more sustained efforts are needed in this regard, because, as the data of the study show, only over 50 percent of data producers and owners make the information on the manner and conditions of data collection (52%) and dissemination (57%) available for the public. In the same

context, at present, some public institutions use alternatives (innovative methods) for data collection, analysis and presentation – such as specific software, automated registers (e.g. The State Register of Voters is interconnected with the Register of Population), information systems (e.g. Civil Service - population records; MICT - population documentation system etc.) [10].

A series of 5 *workshops* (attended by 188 people) have been conducted for consultations on Data Ecosystem Mapping. These workshops were attended by representatives of data communities distributed for consultation purposes by large thematic areas, as a result of SDG grouping under integrated implementation approach: economic; social; energy & environment; civil rights & governance. The workshops' programme included information about SDG and their targets, a description of the areas and the situation regarding SDG indicators by area versus the availability of indicators at the national level and data holders, as well as data sources to secure the requested indicators, the presentation on the operation of the Open data public system, managed by e-Government Centre [14].

3. The data ecosystem model for Moldova

A model of the data ecosystem considered functional for Moldova would entail *using data flows in decision-making by stakeholders*, to secure the strategic priorities correlated with SDG targets and their implementation through a committed and engaging, responsible, transparent and monitored process with civic participation (Figure 1). The functioning model of the data ecosystem for the informed decision-making employing the data revolution, highlights the interaction of the stakeholders involved in decision-making (government, civil society and academia, the private sector /entrepreneurial environment, together with international partner organizations) and decision-driven resources (institutions, legal framework, policy, human resources, infrastructure and ICT, financial resources), using data and information production (collection, processing, access and data exchange, dissemination, analysis and use of data) for monitoring and evaluation of indicators, resulting throughout action plans implementation of strategic documents, through a transparent process and in partnership with the civil society, to adjust the national strategic objectives by reference to the SDG targets.

The central component of the data ecosystem is *the process of transforming data into evidence / tools to support public decisions*. The robustness of the transformation process, the knowledge and its application by all stakeholders will provide a set of consistent data, coherent and useful for the decision-making process. From this perspective, the proper operation of the data ecosystem entails an analysis and evaluation of processes for collecting, processing, access and data exchange (dissemination), analysis and use of data for public policy and the use of innovative approaches and solutions to provide the necessary data and to meet the challenges, arising from the data revolution. Today, *data collection* can be an activity carried out by any actor involved in the decision-making process, respectively by the government and public agencies, civil society, academia and the private sector, for various purposes of private or public interest and by using diverse methods and technologies. Moldova data ecosystem uses all data sources and has access to advanced technology to respond to requests for data collection, necessary for purposes of processing and dissemination.

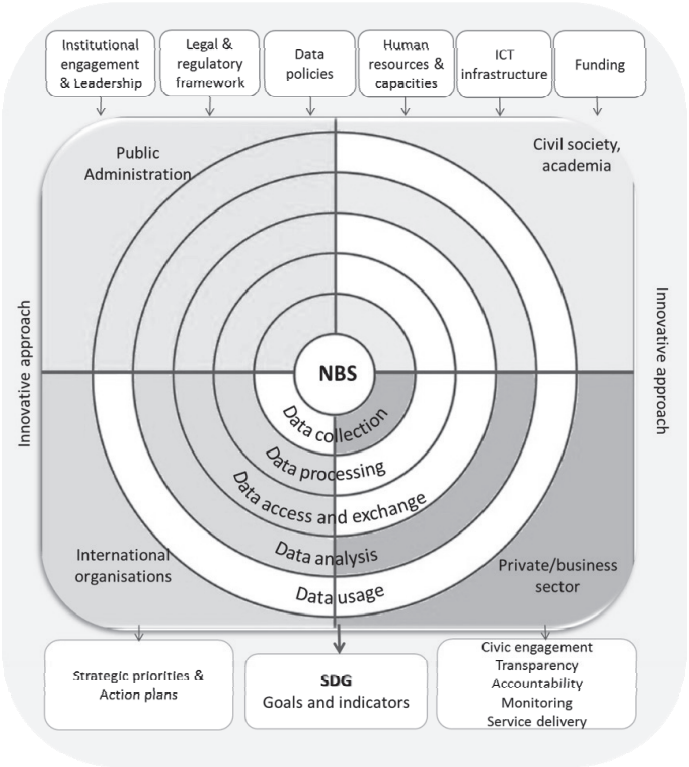

Figure 1: Data ecosystem model for Moldova in SDG context [10]

An efficient use of results of *data collection and processing* implies the application of quality control standards, the use of statistical and ICT capabilities for processing and archiving and the application of methods and standardized formats for data, useful to end beneficiaries in targeted analysis. *Data production is not, and cannot be an end in itself, without ensuring the access and data exchange - data dissemination* - between stakeholders, and ultimately, without the use of data in the decision making process. Dissemination should require availability of data in open and reusable formats for the benefit of citizens and other stakeholders, so that the ultimate usefulness of data would not be altered. The substantiation and support of the decisions with arguments by all stakeholders implies a minimum activity for the *analysis of data* available in the ecosystem. Data analysis is performed via statistical tools by transforming data into useful information and evidence for policy evaluation. Using statistical tools and visualization techniques for data analysis, implies the existence of skilled personnel, certain applications and a communication infrastructure, financial resources and assigning tasks through operating regulations for the use of methodologies confirmed, eventually resulting in data products that are used in decision-making.

Data usage becomes the critical component in the decision making process within the ecosystem. Assessing the current situation regarding data use within the ecosystem will enable the development or strengthening of human resources, procedures and partnerships, so that data can be used to justify policies, monitor implementation and report progress, to empower citizens in holding the involved stakeholders, i.e. the public administration, accountable for decision-making and the results achieved using the resources allocated for the implemented actions.

From the perspective of SDG implementation and reporting, distribution by institutions and groups of producers, owners and indicators' monitors, may result in a better allocation of tasks and responsibilities regarding reporting on the SDG implementation. Preliminary, it is useful to analyse and evaluate the means, resources and tools available for the stakeholders that can be used in data revolution. The current data is not sufficient to monitor the implementation of SDGs, therefore, in order to adjust the national policy and strategic priorities framework in line with SDG targets, a data revolution is needed. This entails an *innovative approach to statistical processes,* to increase the volume of data and the speed of data production, boosting the number of data producers, data dissemination and data mining.

4. Next actions: SDGs targets and indicators localization

The mapping of data ecosystem is just the precursor of the SDG localization for Moldova, and the stakeholders involved in the mapping process of mapping by means of questionnaires and/or participating in the workshops, can support the next steps in data revolution, in an assumed, coordinated process. The potential steps, grouped by several areas of intervention, are presented below.

Institutionalization:

- Develop a formal institutional framework for promotion of knowledge and SDG awareness at the national and local levels, accessible to all stakeholders and coordinated by the State Chancellery, on SDG targets and monitoring indicators;

- Review Government Decisions regulating the strategic planning and decision-making process, by introducing the SDG indicators, as recommended for monitoring and evaluating national strategies;

- Initiate a process of identification by the NBS, with the support of users and the Government, of the possible candidates for establishing innovation development partnerships in the field of statistics, based on their potential (private sector and academia, civil society);

- Motivate the producers and owners of alternative data sources from the private sector, civil society organizations by: establishing new partnerships, ICT assistance or financial support for production, accumulation or use of alternative data sources.

Policies and standards:

- Develop an Action Plan to revise the relevant national strategies, primarily Moldova 2020 strategy, to align it to SDG;

- Simulate in the framework of pilot projects, the policy impact assessment processes, by using SDG indicators and designing policies involving all stakeholders in the pilot areas (e.g. education, environment, economy, administration);

- Secure private-public partnership mechanisms for commissioning statistics services to users;
- Adopt and implement NUTS in Moldova's national statistic system, for the compatibility with standards and promotion of European statistics in the framework of the public administration reform and the Territorial-administrative reform;
- Use traditional and alternative data sources to perform the impact analysis.

Infrastructure and investments:

- Financial incentives for partnerships between the private-public-academic sectors to enhance the use of local IT companies' capacity, for the implementation of innovative ways for collection, processing and effective analysis of existing data - automating the process of working with data (electronic chip, bar code, QR code, SMART GRID smart meters, etc.);
- Ensuring access to broadband in all rural areas, in the framework of the public administration reform at local level;
- Inventory of ICT infrastructure and IT applications within the national statistical system, to assess their ability to respond to the data revolution;
- Establish infrastructure investment programs, necessary for statistics in all ministries and public agencies and implement investment projects in ICT infrastructure in partnership with communications operators and the private sector.

Data usage platform:

- Approve a unique national monitoring and evaluation framework, correlated with SDG for Moldova, based on international best practices and evaluation frameworks with comprehensive libraries of definitions, metadata, taxonomies, metrics and implementation guides;
- Make data available in standardized and reusable formats, agreed upon with the NBS, using already operational instruments (e.g. open data portal);
- Increase the use of the Government interoperability platform and exclude the cases of delaying the connection of public institutions to this platform;
- Develop a national platform with indicators dashboard for monitoring the national strategies, including SDG, and opening it to the public for information and feedback.

Promotion and training:

- Organize workshops with stakeholders to agree on methods for the collection, production and analysis of data necessary for monitoring; annual conferences on SDG achievement;
- Fund a state research program regarding the Sustainable Development Goals;

- Focus the applied research and development projects financed from public funds on topics. that contribute to achievement of SDGs and their related indicators;

- Organize competitions in promoting innovative solutions for the use of data from different sources and their integration, in case of their quality validation, in the official flows of data, used for monitoring and evaluation of public policies;

For a successful data revolution it is important that stakeholders are familiar with the list of recommendations issued under the aegis of the UN Secretary General "Data in support of the post-2015 development agenda: Data revolution". All these actions must be promoted and discussed within the workshops on SDG localization and can be applied immediately, so the opportunity is left open for all stakeholders to participate in the implementation, by bringing ideas on actions' improvement, by defining partnerships based on actions, by commitment on contributing resources and by accountability regarding the results expected in the data revolution.

5. Current actions

Following the above mentioned activities, immediately after the National Conference that took place on June 15, 2016 [4], and where the National Report: "Data Revolution Ecosystem Mapping in the Republic of Moldova" was presented, the next actions have been launched. A series of seminars on SDG targets localization and consultations with stakeholders were organized under the coordination of State Chancellery and with UNDP support. The purpose of the current actions is to debate the SDG targets with public servants from the authorities directly involved in implementing, monitoring and evaluating the national strategies. The expected result was to identify which SDG targets are available for Moldova, based on the actual strategic provisions for each area. The discussions showed that several national and sectorial strategies should be revised, taking into account SDG targets and a balanced monitoring and evaluation scheme. The action plans of strategies and other documents should be updated with new actions and resources, in line with SDGs and UN requirements.

6. Next steps

The National Report defined some recommendations, addressing future developments to implement concrete measures, including those defined by the draft development strategy of the National Statistical System (NSS), which is the largest data ecosystem in Moldova. Therefore, inter alia, it is recommended:

- improving legal and operational frameworks of the NSS, to integrate specific services of the official statistics with those offered and provided by data communities and to ensure timely implementation of the newest IT tools;

- correlation, diversification and expansion of coverage areas of the official statistics, to include the priority fields from the national strategic objectives in the "Moldova 2020" strategy and the sectoral strategies (health, education, agriculture, environment, energy, justice, information technology, etc.) that are harmonized with SDGs;

- the need to meet the requirements of economic and financial environment, entrepreneurs, analysts, media and the public at large, to have relevant and timely statistics in various areas of public interest;

- developing of statistical specialists pool in Moldova and supporting the statistical topics and curricula around universities and inside NSS;

- encouraging the culture of statistics towards a statistical literacy process for all stakeholders of decision making process.

7. Conclusions

Implementing the minimum measures listed above, Moldova could progress very fast on data revolution announced by UN Secretary general, H.E. Ban Ki-Moon [15] and will count on scope of „no one left behind". The prerequisites are partialy set, the basic capabilities exists and can be developed further, and the benefits of data revolution could be reflected in a short time in the lifes of all citizens as part of decision making process based on evidencies. However, the announced by the Government Central Public Administration Reform should take into consideration the assumed by the country commitments to implement SDG and follow the recommended actions.

8. References

[1] A New Global Partnership: Eradicate Poverty and Transform Economies through Sustainable Development. The Report of the High-Level Panel of Eminent Persons on the Post-2015 Development Agenda. UN, May 2013.

[2] A World That Counts. Mobilizing the Data Revolution for Sustainable Development. Expert Advisory Group on a Data Revolution for Sustainable Development. UN, November 2014.

[3] Data for Development. An Action Plan to Finance the Data Revolution for Sustainable Development, Sustainable Development Solutions Network a Global Initiative for United Nations, Open Data Watch, July 2015.

[4] Data revolution: that's how Moldova will achieve the 2030 Development Agenda, http://idsi.md/national-conference-data-revolution-moldova accessed on 08.12.2016.

[5] HLPF Draft Summary, 2016, available at: https://sustainabledevelopment.un.org/content/documents/10858SummaryPresident%202016%20HLPF%20FINAL.pdf accessed on 27.10.2016.

[6] KINDORNAY, S., BHATTACHARYA D., HIGGINS, K.: Implementing Agenda 2030: Unpacking the Data Revolution at Country Level. Dhaka: Centre for Policy Dialogue (CPD), June 2016.

[7] MANOJ, M.: Big Data Governance Frameworks for "Data Revolution for Sustainable Development", available at: http://cis-india.org/internet-governance/blog/big-data-governance-frameworks-for-data-revolution-for-sustainable-development, accessed on 23.10.2016.

[8] Moldova Data Revolution - country sustainable development, http://idsi.md/Moldova-Data-Revolution-country-sustainable-development, accessed on 08.12.2016.

[9] National Development Strategy: 7 solutions for economic growth and Poverty Reduction "Moldova 2020". Law no. 166 from 11.07.2012.

[10] National Report: Data Revolution Ecosystem Mapping in the Republic of Moldova, UNDP, CIVICUS Management and Development Company - CMD Company SRL, Information Society Development Institute, May 2016.

[11] Study: Monitoring the implementation of the Sustainable Development Goals – The role of the data revolution. European Parliament. Directorate-General for External Policies. Policy Department, July 2016.

[12] Sustainable Development Knowledge Platform, https://sustainabledevelopment.un.org accessed on 08.12.2016.

[13] Transforming our world: The 2030 Agenda for Sustainable Development A/RES/70/1. UN, October 2015.

[14] Workshops on Data Revolution: Moldova, 2016, http://idsi.md/ateliere-de-lucru-cartografierea-datelor-in-Moldova, accessed on 08.12.2016.

[15] UN Secretary-General Antonio Guterres and the Sustainable Development Goals http://www.un.org/sustainabledevelopment/secretary-general/

Digital Divide I

TO HAVE, OR NOT TO HAVE: THAT IS *NOT* THE QUESTION! DIGITAL DIVIDE AS A MYTH, OR THE COGNITIVE LIMITATION TO UNDERSTANDING INFORMATION

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There are two tragedies in life. One is not to get your heart's desire. The other is to get it.
George Bernard Shaw, "Man and Superman" (1903), act 4

Abstract
The paper examines the difference between citizens' access to information and their levels of understanding it, in relation to transparency and cognitive issues, in order to understand the issues of digital divide. Research suggests that the effects of transparency on understanding depend upon the way information is presented. Indeed, more detailed content will negatively affect understanding and this negative affect will be stronger when the information is structurally fluent.

The results of both literature review and experiments demonstrate that effects of transparency on information understanding are heavily dependent upon presentation – citizens exposed to more detailed information understand the information worse than those exposed to less detailed information. This relationship is strengthened when the information is structurally fluent.

The research results suggest that guaranteeing citizen the access to information does not necessary mean that they understand it, because of cognitive constrains, according to the cognitive load theory [38]. Digital divide, thus, would not be overcome just because information would be provided. The paper investigates the gap between having information and understanding it, especially when the information is presented in different ways, in order to reconsider its implications for digital divide issues.

1. What is Digital Divide? - Definition and Critique

What is digital divide? There have been and are various definitions; however some were already overcome mostly due to technological changes and advancements, partially thanks to efforts carried out by various actors. Here are some definitions and observations on them worth considering (emphasised by the author).

> The term "digital divide" refers to the gap between individuals, households, businesses and geographic areas at different socio-economic levels with regard to both their opportunities to access information and communication technologies (ICTs) and to their use of the Internet for a wide variety of activities. [26]

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The concept of the digital divide keeps evolving and broadening with new technological developments: some studies have looked into further digital divides emerging among internet users who use multiple mobile devices like tablets and smartphones to access the internet. (…) as digital technologies continue developing, some users embrace them and enhance their online experiences, while others have a limited internet use or do not use the technology at all. [11]

In part the digital divide is about differential access to hardware. In this sense, the digital divide is a simple extension of the century-old goal of "universal service" (…) Another aspect of the digital divide refers to software and the uses of information technology. (…) Still another aspect of the digital divide refers to access to the full range of services through the consumer's network connection, and is called the "equal access" issue. (…) The presence of gaps in access and usage of IT among various socioeconomic groups... [25]

The gap between those who have access to digital technologies and those who do not; or the gap between those who use digital technologies and those who do not understood in binary terms *distinguishing the "haves" from the "havenots"*. (…) I offer a refined understanding of the "digital divide" to include a discussion of different dimensions of the divide focusing on such details as quality of equipment, autonomy of use, the presence of social support networks, experience and online skill. [15]

…the 'digital divide' is originally and persistently plural. This plurality has at least two consequences. First, *there is not one digital divide*; there is a constellation of different and intersecting social, economic, and technological differences, all of which are properly named 'digital divide'. (…) Second, despite the value placed on consistent and precise use of terminology, lexical multiplicity is not necessarily a deficiency. *It is not always a semantic problem to be resolved by prescribing, even provisionally, a univocal and noiseless definition.* Because IT has evolved at historically unprecedented rates, the various problems that are associated with it also experience accelerated change. This is one reason for the variability in the NTIA reports. *The changing definition of the digital divide is not the result of capriciousness or an inability to be precise. It has varied because the technology in question has changed considerably*. [14]

But viewed analytically, there is not one, there are three digital divides -- and emerging in many nations a fourth. The first divide is that which exists within every nation, industrialized or developing, between those who are rich, educated, and powerful, and those who are not. (…) A second digital divide, less often noted, is linguistic and cultural. (…) The third digital divide follows inevitably from the first two -- it is the growing digital gap between the rich and the poor nations. (…) The critical question about the fourth digital divide, however, is whether the prosperity of this new digital elite spreads to the rest of society, especially to urban poor and to rural villagers, or whether it creates an increasingly separate, cosmopolitan, knowledge-based enclave. (…)

The point is that "the digital divide" is really at least four divides, all closely related. The first is internal, between the digitally empowered rich and the poor. (…) The second linguistic-cultural gap is largely between English and other languages, or more generally, between "Anglo-Saxon culture" and other world cultures. The third is the gap exacerbated by disparities in access to information technology between rich and poor nations. Finally, there is the emergent intra-

> national phenomenon of the "digerati", an affluent elite characterized by skills appropriate to information-based industries and technologies, by growing affluence and influence unrelated to the traditional sources of elite status, and by obsessive focus, especially among young people, on cutting edge technologies, disregard for convention and authority, and indifference to the values of traditional hierarchies. [20]

> …the digital divide refers to social stratification due to unequal ability to access, adapt, and create knowledge via use of information and communication technologies (ICT). [43]

> The theory of diffusion of innovations provides an adequate framework to classify the diverse methodological approaches that have been taken to study the digital divide. (…) four perspectives on the digital divide. Two of them are concerned with the type of node: (…) The other two concern the diffusion of innovation: (…) [16]

As Gunkel (2003) puts it; "critical examinations of the digital divide appear to be in short supply. The few commentaries that have been published are little more than reactions and editorials which argue, mainly through anecdotal evidence and personal opinion, that the divide is a myth (Brady, 2000; Cohen, 2000), political hyperbole (Horvath, 2000), bunk (Somerson, 2000), non-existent (Thierer, 2000), or rubbish (Crabtree, 2001). What is needed, therefore, is neither uncritical adherence to, nor simple reaction against, the digital divide but a critique that exposes and investigates the problems inherent in both" [14]. The paper refers to myth, but does not take the stance above mentioned; as European Parliament, even based on a recent redefinition of 2015, still focuses to improve broadband connectivity and internet usage through funding and regulation, that is, targets on infrastructure and skill, the paper tries to offer a critical and different approach to digital divide, mainly through theoretical analysis, supported by exploratory experiments.

The paper focuses on the gap between citizens' access to information, which is often considered as crucial issue for the digital divide discussion, and their levels of understanding it, in relation to transparency and cognitive issues. Research suggests that the effects of transparency on understanding depend upon the way information is presented: more detailed content will negatively affect understanding and this negative affect will be stronger when the information is structurally fluent.

This is a conceptual paper with extended literature review, given the characteristics of its research questions: how differs "understanding information" from "having information"; and how the presentation of information affects understanding. In order to verify the hypothesis delivered from the literatures, a reinterpretation of an existing experiment and a small scale testing were carried out. The results of both literature review and experiment demonstrate that effects of transparency on information understanding are heavily dependent upon presentation – citizens exposed to more detailed information understand the information worse than those exposed to less detailed information. This relationship is strengthened when the information is structurally fluent. These research results suggest that guaranteeing citizen the access to information does not necessary mean that they understand it, because of cognitive constrains, according to the cognitive load theory [38]. The paper investigates the gap between having information and understanding it, in order to contribute to the discussion on digital divide from an unconventional perspective.

2. Theoretical Analysis on Transparency, Information and Understanding

Transparency has long been extolled as means of ensuring that public institutions function effectively [18]. This is because transparency constitutes a key means of reducing information asymmetries between government and the public [37]. By reducing information asymmetries, transparency can empower citizens to better understand what their government is doing, thus permitting them to make decisions that more closely reflect their best interests and, in turn, fostering more accountable and responsive public organizations [12] [17] [30].

Many literatures have begun to examine the extent to which transparency is actually capable of achieving the goals often attributed to it [29]. Findings of these studies have helped to advance understanding of transparency by offering greater insight into how transparency relates to constructs such as trust in government [2] [13] [8]. However, despite these contributions, the field still lacks direct insight into how transparency affects citizens' understanding of government [7]. Throughout the literature, transparency's ability to improve citizens' understanding of government is often assumed [10]. We indeed know very little about how transparency works because we do not know how transparency shapes citizens' understanding of their government and how this understanding in turn bears upon outcomes of interest such as trust in government.

3. Cognitive Limitations on Understanding - Literature Review

Citizens are said to possess an imperfect understanding of how they benefit from public policies [22]. While transparency is proposed as a means of enabling citizens to better understand the benefits associated with a particular policy, expanding access to relevant information is only part of a broader solution to improving citizens' understanding of the benefits associated with public policies. In addition to improving citizens' access to relevant information, government must also work to ensure that policy information is understandable to a broad spectrum of the public [30]. To do so, one must consider methods of presentation that are conducive to effective processing, understanding, and use of the complex information citizens are exposed to [35] [9] [10]. Along these lines, literature from different areas of psychology offers insight into presentation strategies that can attenuate cognitive constraints and, in turn, bolster policy understanding. The paper draws upon insights offered by cognitive load theory (educational psychology) and processing fluency (consumer psychology).

Cognitive load theory explains that as the level of mental effort needed to process information increases, individuals' ability to understand the information embedded in the message decreases [38]. Research on the determinants of mental effort has identified two factors as being of particular importance - structure of the message and complexity of the message [4]. Specifically, what this research illustrates is that messages that tend to be more complex and poorly structured increase levels of mental effort that must be expended in order to understand the message and, as a result, detract from understanding [39]. Therefore, reducing complexity and improving the structure of messages communicating government information are two methods that may improve citizens' understanding of information, which might draw new insights into digital divide discussion.

3.1 Complexity

Complexity of a message is typically mitigated via two forms of omission [42]. The first form of omission entails reducing the quantity of information embedded in a single message [39]. While reducing the amount of information can detract from an individual's ability to understand the issue

in a comprehensive sense, it does increase the likelihood of them better understanding the limited information they are exposed to [3]. However, from a perspective of government transparency, this strategy is problematic because it may detract from the public's ability to comprehensively understand a particular policy. Furthermore, and perhaps more importantly, this approach can also conflict with legal obligations that govern public disclosure. For these reasons, the second form of omission, which relates to reducing the level of detail with which the information embedded in the message is discussed, is preferred [21]. The assumption is that foregoing specific facts and figures when presenting new information will allow individuals to better focus their attention on the salient information in the message [6]. That is, using less detailed language allows individuals to exert less mental effort when processing the message and, therefore, improve their understanding of the information in the message [1].

3.2 Structure

The concept of processing fluency from consumer psychology provides a framework for understanding how the structure of a message can be manipulated in order to reduce cognitive load and facilitate citizens' ability to understand public policy [33] [45]. Processing fluency research has identified a number of ways in which the structure of a message can be altered in order to help audiences better understand the information they are exposed to [33] [19] [36]. Across the different manipulations, a common theme is that they all attempt to alter, in one way or another, the clarity with which information is presented, by for example, altering letter fonts or breaking a message into bullet points. Yet, despite the variety of processing fluency manipulations, an important observation is made by Rennekamp (2012), who notes that, irrespective of the range of methods used to improve the structure of a message, "the corresponding responses from individuals are remarkably similar across different settings" [34]. Specifically, improving the structure of a message to enhance clarity of presentation, irrespective of the precise manner in which it is done, is generally found to improve individuals' ability to process and, ultimately understand, the information they are exposed to [24].

4. Complexity and Structure of Information - Cognitive Load Theory and Processing Fluency Literature

Fung, Graham, and Weil (2007) caution that, because transparency is critical to enhancing citizens' understanding of government, governments must find ways of presenting the information so as to avoid overloading citizens with information and evoking 'policy confusion' [27] [12]. Cognitive load theory and processing fluency literature offer methods of attenuating information overload in order to ensure that citizens understand the government information they are exposed to. Among these methods, two have been identified as being of immediate relevance to the purposes of this study – detail and structure [19] [5] [34].

The logic underlying these initiatives is that more detailed accounts of government actions make it more difficult for citizens understand what government is doing. This is because greater mental effort must be exerted in order to process the detailed information being presented to them [27] [23]. Prat (2005) adopts a game theoretic perspective to illustrate this point [32].

Prat explains that, due to cognitive constraints, an agent can overwhelm the principal by burying a message's signal in lots of highly detailed information [23]. Research related to cognitive load theory, echoes the sentiments expressed by Prat (2005), while also providing empirical illustrations. This line of research demonstrates across a variety of settings how different methods of enhancing

the complexity of a message through, for example, the inclusion of more detailed information (facts and figures) consistently makes the message more difficult to understand [40] [41]. The reason for this is that increasing the complexity of a message bolsters the mental effort needed to make (comprehensive) sense of the different pieces of information embedded in the message. Conversely, reducing the complexity of a message by using less detailed language can mitigate cognitive constraints, thereby increasing the likelihood that citizens will be able to understand the information they are exposed to.

In line with discussions of information overload, more detailed descriptions of a policy are likely to make it more difficult for citizens' to process the information and, consequently, detract from their levels of understanding. Therefore, in order to improve citizens' levels of understanding, government information that discusses policies in more general terms is likely preferred in that it is simpler, provided it offers an accurate overview of a policy.

A second important means of improving citizens' understanding of a public policy is to ensure that information is structured effectively. Here, structure is understood as the organization of information within a message [40]. Ensuring effective structure means the content of a message is organized in a way that reduces the mental effort needed to pick out key points embedded in the message [36]. As mentioned, there are numbers of presentation methods used to enhance structural fluency [33]. However, one common method of enhancing the structural fluency of a message is to organize content in a message into smaller distinct issue-specific elements [28] [39]. Bracketing content in this way results in consumers of the information exerting less mental effort when attempting to identify and consequently process salient aspects of the message [41]. By improving the structural fluency of a message in this way, individuals can allocate a greater proportion of mental effort to interpreting signals in a message and spend less time sifting through noise in the message to identify signals of interest. As such, the effect of policy transparency on policy understanding will be stronger when the structural fluency of the government information outlining the policy is high.

5. Validation - Reinterpretation of Experiment, Test, and Findings

Due to financial and time constrain to tailor a large-scale scenario-based survey for this research, the paper analyses and reinterprets an existing experiment conducted by Porumbescu and his team (2016) in a different setting with different focus and objectives, but with somewhat similar ideas, that is to analyse relationship between information and understanding, although the original research focused on impact of policy transparency on citizens' levels of policy understanding and support for a hypothetical policy [31]. The survey affords generalizable insight into how level of detail and processing fluency of information government presents to citizens affect their ability to understand the information they are presented with.

The original experiment was carried out in order to test the hypothesis that more detailed content will negatively affect understanding and this negative affect will be stronger when the information is structurally fluent [31]. The survey was conducted on a nationally representative panel of 510 US citizens. All subjects were presented with the same general information about a hypothetical policy. At the beginning of the experiment, subjects were provided with instructions and a brief description of the experiment. After agreeing to participate in the survey, subjects were then randomly assigned to one of four policy transparency treatment groups. Each of the treatment groups explained the same policy but differed in the way the information was structured and the level of detail the policy

was discussed in. After being subjected to a treatment, all subjects were then directed to respond to the same survey.

Policy understanding was analysed through its two dimensions. The first dimension focuses upon subjects' objective policy understanding; subjects were asked a series of nine multiple-choice questions pertaining to the policy prompt they read in order to gauge their level of objective understanding. Their responses were summed in order to create an additive index, where a score of nine corresponded to the highest possible level of objective understanding and a score of zero corresponded to the lowest possible level of objective policy understanding. The second dimension assesses subjects' sense of understanding. While objective understanding is conventionally said to play an important role in informing individuals behaviours and attitudes, feelings-as-information theory argues that an individual's sense that they understand a particular issue (or information they have read pertaining to said issue) also plays a critical role in shaping individual behaviours and attitudes pertaining to said issue [36]. Citizens' objective and subjective understanding of a policy both must be accounted for when attempting to explain the relationship between transparency, understanding, and voluntary policy compliance. Subjective understanding is measured using two items. The first item asked subjects to evaluate their level of policy understanding using a seven-point Likert scale (1: did not understand at all; 7: understood very well). The second item asked respondents how many general questions out of seven they believe they would be able to answer correctly (1: none correct; 8: all correct). Responses to both items were first standardized then averaged.

The results suggest that providing citizens with more detailed information about a policy does not necessarily detract from the public's ability to understand that policy. While greater detail did not affect individual's actual understanding of the material they were exposed to, it did negatively affect respondents' perception that they understood the material they were exposed to. Regarding the impact of structure, providing participants with more detailed information decreased their understanding of the policy only when the information was fluent. To the contrary, varying the level of information detail did not significantly affect participants' understanding of the policy when the information was presented in a dis-fluent manner.

The results of the experiments seem to support the following hypothesis: 1) exposure to more detailed information about a policy decreases policy understanding; and 2) information fluency will moderate the negative effect of information detail on policy understanding, such that the negative effect of information detail on policy understanding will be stronger when the information is structurally fluent and weaker when the information is structurally dis-fluent.

In order to check the validity of the experiment in different culture settings, the author conducted a test, which was designed after the above mentioned experiment, with the policy issue and its statements modified to fit for the Japanese participants. The test was conducted in February 2017 with a participation of 35 students. Because of its small size of the participants, the statistical validation of the results is rather poor; however the responses clearly confirmed the above mentioned hypothesis. Indeed, who read more detailed information understood less about the issue than those who read less detailed information. Also the way the information was stated influenced the understanding. This test has another crucial limitation, which is the homogeneity of the participants, that is, all 35 students were freshmen of the Faculty of Law of Chuo University and registered to the seminar of the author. Thus, a further and tailored experiment of a certain scale would be necessary to validate the Porumbescu experiment in the context of digital divide as well as in different cultural settings.

6. Conclusion - Limitation and Contribution

Although the validation of the results of theoretical analysis relies on a reinterpretation of an existing experiment and on a small scale test, thus exposed to various limitations above mentioned, the literature review and the results of the experiment draw interesting insights, which fundamentally affect the conventional discussion on digital divide.

Exposure to more detailed information does not seem positively influence the understanding and this means that providing infrastructures and skill to access information, which is one of the most popular policy recommendations related to digital divide, is not enough to improve citizens' understanding.

One contribution of this paper stems from the insight it provides into the role presentation plays in shaping the impact on understanding. What is becoming increasingly apparent is that simply making more information available is, in itself, not enough to bring about a more informed and understanding citizen. Rather, for transparency to bolster citizens' understanding, steps must be taken to ensure that information is being presented to citizens in ways that they can use it.

Then, what would be the implications of the results of this research for the digital divide discussion? Much of the existing work on digital divide tends to focus exclusively on importance of ensuring access to information. The findings of this research offer evidence to suggest that having access to detailed information is not the ultimate solution, but how the information is provided plays an important role in improving the understanding of information, which is the crucial issue for the citizen. Thus, guaranteeing infrastructure, hardware, software, and maybe education to enhance skill are not enough for better understanding, but presenting information in easy-to-understand way. Indeed, the way information is presented to the public is just as important as the information itself. Some methods of communicating information are much more effective at enhancing understanding than others. This would be an interesting hint as well as important contribution to the current digital divide discussion.

7. References

[1] AYRES, P.: Using subjective measures to detect variations of intrinsic cognitive load within problems, Learning and Instruction, 16(5), 2006, pp 389-400.

[2] BENITO, B. and BASTIDA, F.: Budget transparency, fiscal performance, and political turnout: An international approach, Public Administration Review, 69(3), 2009, pp. 403-417.

[3] BLAYNEY, P., KALYUGA, S. and SWELLER, J.: Using Cognitive Load Theory to Tailor Instruction to Levels of Accounting Students' Expertise, Journal of Educational Technology & Society, 18(4), 2015, pp. 199-210.

[4] CHANDLER, P. and SWELLER, J.: Cognitive load theory and the format of instruction, Cognition and Instruction, 8(4), 1991, pp. 293-332.

[5] CLARK, R.C., NGUYEN, F., SWELLER, J. and BADDELEY, M.: Efficiency in learning: Evidence based guidelines to manage cognitive load, Performance Improvement, 45(9), 2006, pp. 46-47.

[6] COOK, M.P.: Visual representations in science education: The influence of prior knowledge and cognitive load theory on instructional design principles, Science education, 90(6), 2006, pp. 1073-1091.

[7] COOK, F.L., JACOBS, L.R. and KIM, D.: Trusting what you know: Information, knowledge, and confidence in social security, The Journal of Politics, 72(02), 2010, pp. 397-412.

[8] DE FINE LICHT, J.: Policy area as a potential moderator of transparency effects: An experiment, Public Administration Review, 74(3), 2014, pp. 361-371.

[9] EPPLER, M.J. and MENGIS, J.: The concept of information overload: A review of literature from organization science, accounting, marketing, MIS, and related disciplines, The Information Society, 20(5), 2004, pp. 325-344.

[10] ETZIONI, A.: Is transparency the best disinfectant?, Journal of Political Philosophy, 18(4), 2010, pp. 389-404.

[11] EUROPEAN PARLIAMENT: Briefing - Bridging the digital divide in the EU, 2015. http://www.europarl.europa.eu/RegData/etudes/BRIE/2015/573884/EPRS_BRI% 282015 %29573884_EN.pdf

[12] FUNG, A., GRAHAM, M. and WEIL, D.: Full disclosure: The perils and promise of transparency, Cambridge University Press: Cambridge, 2007.

[13] GRIMMELIKHUIJSEN, S.G. and MEIJER, A.J.: The effects of transparency on the perceived trustworthiness of a government organization: Evidence from an online experiment, Journal of Public Administration Research and Theory, 24(1), 2014, 137-157.

[14] GUNKEL, D.J.: Second thoughts: toward a critique of the digital divide, New Media & Society, 5(4), 2003, pp. 499-522.

[15] HARGITTAI, E.: The Digital Divide and What To Do About It, in Jones, D. C., ed. New Economy Handbook, San Diego, CA: Academic Press, 2003, pp.822-841.

[16] HILBERT, M.: The end justifies the definition: The manifold outlooks on the digital divide and their practical usefulness for policy-making, Telecommunications Policy, 35(8), 2011, pp. 715-736.

[17] HOOD, C.: Accountability and transparency: Siamese twins, matching parts, awkward couple?, West European Politics, 33(5), 2010, pp. 989-1009.

[18] HOOD, C: Beyond Exchanging First Principles? Some Closing Comments, in Hood, C. and Heald, D., eds., Transparency: The Key to Better Governance?Oxford, UK: Oxford University Press, 2006, pp. 211–226.

[19] JANISZEWSKI, C. and MEYVIS, T.: Effects of brand logo complexity, repetition, and spacing on processing fluency and judgment, Journal of Consumer Research, 28(1), 2001, pp. 18-32.

[20] KENISTON, K.: Introduction: The Four Digital Divides, in Keniston, K. and Kumar, D., eds., The Four Digital Divides, Sage Publishers, 2003.

[21] KIRSCHNER, P.A.: Cognitive load theory: Implications of cognitive load theory on the design of learning, Learning and Instruction, 12(1), 2002, pp. 1-10.

[22] KOCH, J. and METTLER, S.: Who Perceives Government's Role in Their Lives, Assessing the Impact of Social Policy on Visibility. Working paper, 2012.

[23] MANSBRIDGE, J.: A Selection Model of Political Representation, Journal of Political Philosophy, 17(4), 2009, pp. 369-398.

[24] MIELE, D.B. and MOLDEN, D.C.: Naive theories of intelligence and the role of processing fluency in perceived comprehension, Journal of Experimental Psychology: General, 139(3), 2010, pp. 535-557.

[25] NOLL, R.G., OLDER-AGUILAR, D., ROSSTON, G. and ROSS, R.R.: The Digital Divide: definitions, measurement, and policy issues, paper presented at Bridging the Digital Divide: California Public Affairs Forum, Stanford University, 2000.

[26] OECD: Bridging the digital divide, 2001, https://www.oecd.org/site/schoolingfortomorrow knowledgebase/themes/ict/bridgingthedigitaldivide.htm

[27] O'NEILL, O.: A Question of Trust: The BBC Reith Lectures 2002. Cambridge, UK: Cambridge University Press, 2002.

[28] PAAS, F., RENKL, A. and SWELLER, J.: Cognitive load theory and instructional design: Recent developments, Educational Psychologist, 38(1), 2003, pp. 1-4.

[29] PIOTROWSKI, S.J.: Transparency: A regime value linked with ethics, Administration & Society, 46 (2), 2014, pp. 181-189.

[30] PORUMBESCU, G.A.: Using Transparency to Enhance Responsiveness and Trust in Local Government Can It Work?, State and Local Government Review, 47 (3), 2015, pp. 205-213.

[31] PORUMBESCU, G.A., BELLÉ, N., CUCCINIELLO, M. and NASI, G.: Translating policy transparency into policy understanding and policy support: Evidence from a survey experiment. Working paper, 2016.

[32] PRAT. A.: The Wrong Kind of Transparency, The American Economic Review, 95(3), 2005, pp. 862-877.

[33] REBER, R., WINKIELMAN, P. and SCHWARZ, N.: Effects of perceptual fluency on affective judgments, Psychological Science, 9(1), 1998, pp. 45-48.

[34] RENNEKAMP, K.: Processing fluency and investors' reactions to disclosure readability, Journal of Accounting Research, 50(5), 2012, pp. 1319-1354.

[35] SIMON, H.A.: Models of bounded rationality: Empirically grounded economic reason (Vol. 3), MIT press: Cambridge, 1982.

[36] SONG, H. and SCHWARZ, N.:. Fluency and the detection of misleading questions: Low processing fluency attenuates the Moses illusion, Social Cognition, 26(6), 2008, pp. 791-799.

[37] STIGLITZ, J.E.: Reforming the global economic architecture: lessons from recent crises, The Journal of Finance, 54(4), 1999, pp. 1508-1522.

[38] SWELLER, J.: Can we measure working memory without contamination from knowledge held in long-term memory?, Behavioral and Brain Sciences, 21(06), 1998, pp. 845-846.

[39] SWELLER, J.: Element interactivity and intrinsic, extraneous, and germane cognitive load, Educational Psychology Review, 22(2), 2010, pp. 123-138.

[40] SWELLER, J. and CHANDLER, P.: Why some material is difficult to learn, Cognition and Instruction, 12(3), 1994, pp. 185-233.

[41] VAN MERRIËNBOER, J.J. and SWELLER, J.: Cognitive load theory and complex learning: Recent developments and future directions, Educational Psychology Review, 17(2), 2005, pp. 147-177.

[42] VAN MERRIËNBOER, J.J. and SWELLER, J.: Cognitive load theory in health professional education: design principles and strategies, Medical Education, 44(1), 2010, pp. 85-93.

[43] WARSCHAUER, M.: A Literacy Approach to the Digital Divide, Cadernos de Letras (UFRJ), n. 28, 2011, pp. 5-18.

[44] WINKIELMAN, P., SCHWARZ, N., FAZENDEIRO, T. and REBER, R.: The hedonic marking of processing fluency: Implications for evaluative judgment, in Musch, J. and Klauer, K.C., eds., The psychology of evaluation: Affective processes in cognition and emotion, Lawrence Erlbaum Associates, Inc., Publisher, 2003, pp. 189-217.

ECONOMIC EFFECTS OF THE DIGITAL DIVIDE ON PENSIONERS IN GERMANY REGARDING RETAIL BANKING SERVICES

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Abstract:
In the recent two decades, many service sector companies like banks altered their services and fees towards a regime whereby customers either bank online on their own or face comparatively high fees. The current phase of interest rates close to zero or even below - due to the euro crisis - enhances this trend. Many commercial banks in Germany have increased their fees for current accounts significantly, the common "free current account" policy has come more or less to an end. Many of the pensioners - in Germany there are more than 20 million retirees - are affected, because their pensions are quite low and they are not familiar with doing their banking the online way. This paper analyzes the situation based upon statistical data and develops other fee structures which are more just, from a social point of view, than burdening the elderly with low incomes.

1. Economic crisis and the role of the ECB

In the autumn of 2008, the financial crisis reached a peak, when Lehman Brothers Holdings Inc., one of the biggest American investment banks, had to file for bankruptcy. There was cause for concern that many banks in Europe could file for bankruptcy too. The European states were quarrelling about how to meet the crisis, which (fiscal) measures should be taken in order to save European banks and how to boost the European economy again. In contrast to the European states, the European central bank (ECB), acted swiftly and put into place a very accommodating monetary policy. The ECB was, however, also criticized for this. The main allegation was and furthermore still is, that the main objective of the ECB would be jeopardized.

The primary objective of the ECB is to maintain price stability, as defined in Article 127(1) of the Treaty on European Union: "*Without prejudice to the objective of price stability, the ECB shall support the general economic policies in the Union with a view to contributing to the achievement of the objectives of the Union as laid down in Article 3 of the Treaty on European Union."*

Article 3 (3) of the Treaty on European Union: *"The Union shall establish an internal market. It shall work for the sustainable development of Europe based on balanced economic growth and price stability, a highly competitive social market economy, aiming at full employment and social progress and an high level of protection and improvement of the quality of the environment. It shall promote scientific and technological advance."*

In 1998 the Governing Council of the ECB announced the quantitative definition of price stability: *"Price stability shall be defined as a year-on-year increase in the Harmonised Index of Consumer Prices (HICP) for the euro area of below 2%. Price stability is to be maintained over the medium term"*. The Governing Council further clarified that, within the definition, it aims to maintain

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inflation rates “below, but close to, 2% over the medium term”. By referring to “an increase in the HICP of below but close to 2%” the definition makes clear that not only inflation above 2%, but also deflation is inconsistent with price stability. In the pursuit of price stability, the Governing Council’s explicit aim is to maintain the inflation rate at a level below, but close to, 2%. [1]

In the last few years the inflation rate in the euro area was and is, well below the 2% (see table 1). The setting of an objective for monetary policy in a monetary union also takes into account the existence of inflation differences across regions in the union which operate at different stages of economic development. Inflation differences between the euro area countries are moderate.

year	Inflation rate (euro area)
2013	1,3 %
2014	0,4 %
2015	0,0 %
2016	0,2 %

Table 1: Rate of inflation in the euro area [2]

Without prejudice to the primary objective of price stability, the ECB has to support the general economy. The rate of inflation is low. So, according to Article 3, the ECB shall “support the general economic policies in the Union with a view to contributing to the achievement of the objectives of the Union” which include, inter alia, “full employment” and “balanced economic growth”. A closer look at the statistics indicates a relatively high unemployment rate and a weak economic growth in the euro area.

Due to the financial and economic crisis, the number of unemployed persons in the euro area has risen considerably. In 2007, the unemployment rate in the euro area was still at 7.4%. It rose to 12.0% in 2013 and then declined to 10.9% in 2015. The following countries have particularly high unemployment rates (2015): Greece (24.9%), Spain (22.1%), Portugal (12.6%) and Slovakia (11.5%). In contrast Germany (4.6%), Malta (5.4%) and Austria (5.7%) have particularly low unemployment rates. [3] The gross domestic product (GDP) in the euro area has risen only slightly in recent years: In 2012 and 2013 the rate of growth was even negative: 2012 (-0.9 %), 2013: (-0.3 %), 2014: (+1.2 %) and 2015: (+ 2.0%). Greece has recorded significant growth slumps in the year 2011 (-9.1%) and 2012 (-7.3%). [4]

2. Important instruments of ECB

In order to achieve the objectives mentioned above, the ECB has at its disposal a set of monetary policy instruments, in particular it conducts open market operations and standing facilities.

2.1 Open market operations

Open market operations play the most important role in the monetary policy of the ECB. They are used for steering interest rates and for managing the liquidity situation in the market. With these operations the ECB lends funds to commercial banks. The ECB can set the main conditions: the interest rate and the amount of money. Since October 2008 and the collapse of Lehman Brothers, a full allotment procedure was introduced. No longer is allocation volume fixed in advance. Each commercial bank receives the amount of “base money” it needs. Furthermore the ECB reduced the main interest rate over the years to 0% in 2016, an historically low level. (see table 2)

2.2 Standing facilities

For the purpose of controlling short-term interest rates in the money market, the euro system also offers two standing facilities to commercial banks**:** the marginal lending facility and the deposit facility. Both facilities have an overnight maturity and are available to commercial banks on their own initiative. [5]

Commercial banks can use the "marginal lending facility" to obtain overnight liquidity from the national central banks for eligible assets. There are no credit limits or other restrictions on commercial banks access to the facility apart from the requirement to present sufficient underlying assets. The interest rate on the marginal lending facility normally provides a ceiling for the overnight market interest rate.

Commercial banks can use the "deposit facility" to make overnight deposits with the national central banks. There are no deposit limits or other restrictions. The interest rate on the deposit facility normally provides a floor for the overnight market interest rate.

As the overall amounts requested by banks were higher than the liquidity needs of the banking system during this period, the excess liquidity was placed in the deposit facility by many commercial banks. However, the ECB does not want the excess liquidity to be re-invested in the deposit facility. The ECB would prefer to see this money lent to companies and to individuals in order to stimulate the economy. The ECB did not want to forbid the use of the deposit facility but has made this instrument unattractive. For the first time in history, the ECB set a negative (!) interest rate. The deposit rate currently stands at - 0.4%. Now, commercial banks must pay an interest rate for placing short term money at the ECB.

The interest rate on the marginal lending facility is normally substantially higher than the corresponding money market rate and the interest rate on the deposit facility is normally substantially lower than the money market rate. By setting the rates on the standing facilities, the Governing Council effectively determines the band within which the overnight money market rate can fluctuate.

Selected years	Main interest rate	*deposit facility rate*	*marginal lending facility rate*
31.12.2007	4,0 %	3,0 %	5,0 %
31.12.2008	2,5 %	2,0 %	3,0 %
31.12.2009	1,0 %	0,25 %	1,75 %
31.12.2013	0,25 %	0,0 %	0,75 %
31.12.2014	0,05 %	-0,2 %	0,3 %
31.12.2016	0,0 %	-0,4 %	0,25 %

Table 2: Development of the ECB key interest rates since 2007 [6]

Table 2 shows the development of key interest rates since 2007. The general decline in interest rates is noticeable. Also noticeable is the spread between the interest rates, it becomes much closer, from 3,0 % and 5,0 % in 2007 to -0,4 % and 0,25 % in 2016.

2.3 Transmission mechanism of monetary policy

With low interest rates, the ECB is pursuing certain perceptions of its effects. The process through which monetary policy decisions affect the economy is known as the transmission mechanism of monetary policy. It is a (long) chain of causes and effects linking monetary policy decisions with

real economic data. The chain starts with a change in the official interest rates set by the ECB. [7] Changes in money market rates in turn affect other interest rates, albeit to varying degrees. Changes in money market rates also have an impact on interest rates set by banks on short term loans and deposits. It affects savings, spending and investment decisions of companies and households. Lower interest rates tend to make it more attractive for households and companies to take out loans in order to finance their consumption or investment. This will increase GNP and the unemployment rate can be reduced. This transmission process is, however, very long and its effects are uncertain. In southern European countries like Greece, the transmission process hardly functions at all.

Despite the very accommodating monetary policy, the sum of money in circulation has risen sharply and interest rates have fallen to an historically low level – Greece fell into a long and deep depression. Furthermore, the accommodating monetary policy has negative side effects and creates new problems in other countries like in Germany. The economic situation in Germany is good but, due to the low net interest spread, banks now earn less money. Furthermore the depositors hardly earn any interest when they put their money into the bank. It also has negative effects on pension plans of individuals.

The longer the period of low interest rates lasts, due to the economic situation in many countries in southern Europe, the more serious are the consequences for banks and for depositors. Because of their bread and butter business model, of lending and saving more and living on the net interest spread, more or less collapsed, many banks find themselves obliged to raise their fees.

3. Digitalisation

In addition to the persistent reduction of the margins, there is another huge challenge for banks: the digitalisation. The increasing use of digital formats should have a positive impact on banks' earnings situation by cutting costs. With digitalisation, profitability can be increased in the long term. In the short term, however, this initially entails higher costs. Financial institutions firstly must invest massively in new digital facilities. They have little choice. They must be prepared to see their competitive position deteriorate in the medium term, as lower prices will reduce margins and new digital offerings will cannibalize traditional products and services.

Most institutes have seen that interaction with customers is fundamentally changing. So many digital initiatives have already been implemented. A lot of banks produced digital applications, so-called "apps", which make it easier for the customers to do their banking transactions via smartphones or tablet computers. [8] Many institutions use the challenge of digitalisation in order to reduce their branch network. They can streamline their processes, sharpen their range of services and align them increasingly to the needs of their customers as well as tap into new revenue potential by deepening the customer relationship. They have brought their technologically competent clientele onto their website to try to replace even fully automated stores with automated kiosks. The nature of communication and the analysis of investment decisions are changing. Before visiting a branch, the customers more often use the Internet to find out about the products and services, compare conditions, or obtain opinions from other consumers.

Despite the comfortable use of digitalisation, one thing remains very important for customers: The basic need for customers to save their money in a safe environment. Another important aspect for customer and banks is that of the charges. It is necessary to create a transparent and uniform price structure across all off line and online channels. Currently, many banks are still promoting low cost online fees, i.e. for current accounts, in order to motivate customers to make transactions online. If

financial institutions want to stick to a different price strategy, they must be able to justify convincingly this differentiation and the differences in performance behind it. Pricing should also take into account customer behavior.

4. Payment behavior

In several surveys the German Bundesbank has stated that people in Germany are changing their behavior for paying for goods and services, but only slowly. Changes in this area are not yet revolutionary but evolutionary and in small steps. Cash is still the most important payment medium. 53% of all transactions are paid with cash. Half of the customers are fixed in their choice of payment instrument: 33% of respondents always pay cash, 17% pay cash wherever it is possible. For payments up to 50 euro, cash is still by far the most frequently used method of payment. In principle, predefined behavior can make it difficult for innovation in payment transactions. The age of the interviewees still has a significant influence on their payment behavior. Retirees especially have a high preference for cash payment. Nearly half of the retirees interviewed stated that their payments are made exclusively with cash. The pure cash payers tend to be amongst the older and even the less well off, whereas the non cash payers are more likely to be recruited from younger and higher income respondents. The most important reason why every third person pays only cash is the feeling of better spending control. [9]

Mobile and contactless payment methods are still rarely used, in particular due to a lack of consumer acceptance in the retail trade but also due to inadequate consumer equipment with insufficient contactless payment cards and mobile payment methods being available. More and more goods and services are purchased online. This development basically promotes the use of non cash payment instruments.

A representative survey, conducted by the German Banking Association in 2014, concluded that 65% of people aged 18-59 use online banking. Only 33% of the seniors over 60 years, however, are using online banking. [10] So 67% of the seniors do not use online banking. According to the current study of Initiative D21, some 70 percent of all over 70s in Germany have no Internet access. [11] Thus they are practically excluded from the use of many facilities. This phenomenon is particularly widespread amongst the users of banking products. Many offers are only available online. The Sparkasse Berlin, for example, offers deposit bank accounts only online. Online banking seems to ignore the customer needs of the older people. Indeed, banks are suffering from the current low interest rate and are therefore striving to reduce their personnel costs. Critics say, however, that saving personnel costs must not lead to people without internet access being disconnected or disadvantaged, but they are disadvantaged.

5. Fees of current accounts: selected banks in Germany

According to “Finanztest”, a respected consumer magazine in Germany, there were only 24 free current accounts in more than 200 current account models available at approximately one hundred banks at the end of 2016. This includes all online transactions, with the use of debit card free of charge and no other conditions having to be fulfilled. Amongst them there are only two affiliated banks, all others are online banks. [12]

Banks have increased their fees for current accounts, or linked them to some other conditions such as the certain receipt of a sum of money every month. The intense competition, the advancing digitalisation and the sustained low level of interest rates, coupled with low interest rate margins,

increases the pressure on banks to reconsider their cost structure. There are a lot of banks with very different current account models. For analyzing the fees payable for current accounts, the author has selected the three banks with the most branches in Germany: Deutsche Bank: 2,984 branches, Commerzbank: 1,530 branches and Postbank: 1,092 branches. They also each have millions of customers.

5.1 Current account fees: Postbank (14 million customers)

The Postbank is one of the largest banks in Germany. In November 2016, the Postbank launched a new charging system for its various current account models. Dependant upon usage behavior and receipt of money, they differ in price and performance. [13]

The **"Postbank Giro start direct"** is a mainly free of charge current account for customers up to 22 years of age. The reason is obvious ; it is a strategy to tie young people to the Postbank. It is also assumed that young customers are doing their transactions online. For off line transactions one has to pay 0.99 each. For persons older than 22 years there is the "**Postbank Konto – Giro direct".** Here one has to pay a fee for the current account of 1.90 euro per month. It is a tariff for people doing many transactions online. For telephone banking one has to pay 1.50 euro per transaction and also to pay 1.50 for off line. For those persons who wish to do their transactions digitally, but also want personal contact, there exists the **"Postbank Giro Plus".** Here one has to pay a basic fee of 3.90 euro and 0.99 euro for each transaction off line. The so called comfort account **"Postbank Giro extra plus"** is "for all who require additional extras included". In this case one does not have to pay for each transaction off line. One does have to pay a fee of 9.90 euro per month but, starting with receipt of money of more than 3,000 euro per month, this account is free of charge. So this is a costly alternative if one does not receive more than 3,000 euro per month. Postbank argues that this alternative is very personnel cost intensive. This alternative is preferred by many retirees because they use online banking less frequently.

5.2 Current account fees: "Deutsche Bank" (10 million customers) [14]

The system of current account fees of the Deutsche Bank is similar to the system of the Postbank. The Postbank is a subsidiary of the "Deutsche Bank".

The "**JungeKonto"** is especially for young customers. The account is free of charge for pupils and students. The main goal of this price policy is to gain customer loyalty. For credits made by credit transfer form, or made by a bank transfer and placed via customer service hotline staff, or at a Deutsche Bank branch, one has to pay 1.50 euro, if the account holder is older than 18 years. The advertising of the "Deutsche Bank" claims that this current account model is an account for persons who prefer "modern and convenient online and mobile banking". The "**AKTIVKonto"** is for customers who also prefer online and mobile banking. The monthly charge is 4.99 euro. Setting up and amending standing orders, via customer service hotline staff, costs 1.50 euro. For cheques drawn and presented, one has to pay 1.50 euro. For credits made by credit transfer form, or made by a bank transfer and placed via customer service hotline staff, or at a Deutsche Bank branch, one has also to pay 1.50 euro. The monthly charge for the **„db BestKonto**" is 9.99 euro, almost all services being included.

5.3 Current account fees: "Commerzbank" (more than 11 mio. customers) [15]

The system of fees of the Commerzbank is quite similar to the current account systems of the Postbank and the Deutsche Bank.

The **„StartKonto"**, a current account for young people, is free of charge. For each cheque drawn and presented one has to pay 1.50 euro. If one selects the **„PremiumKonto"**, one has to pay a monthly charge of 9.90 euro, the main services being included. If one selects the **"0-euro-account"** one has to pay 9.90 euro per month but, if one receives 1,200 euro and more per month, this current account is free of charge. One does, however, have to pay 1.50 euro for every credit made by means of a credit transfer form and for every telephone banking transaction, 1.50 euro too. The monthly charge for the **„AktivKonto"** is 7.90 euro. It is a little cheaper than the "PremiumKonto", but for telephone banking, one has to pay 1.50 euro per transaction. Another current account model is the **„BasisKonto"**. Here one has to pay 6.90 Euro each month. For cheques drawn and presented one has to pay 1.50 euro per transaction and for telephone banking 1.50 for each remittance.

5.4 Summary and consequences of the current account models

In recent years many banks have increased their current account charges. The strategy behind the new current account charging systems is obvious. If the customers are using online banking, the current account fees are inexpensive, often they are free of charge. If the customers do not use online banking, then they have to pay high fees. It is interesting and conspicuous that all three merchant banks examined offer an "all inclusive current account model" with a monthly fee about 9,90 euro: Postbank: 9.90 euro, Deutsche Bank: 9.99 and Commerzbank: 9.90 euro. Only 33 % of people older than 60 years are using online banking. So most of the older people cannot, or do not, use online banking. As a result, they often choose an expensive current account model. (Unfortunately there is no official data on this but interviews with three bank employees confirm that retirees very often choose "all inclusive models".)

Around 20 million Germans lived on a pension in 2015. Male pensioners received, on average, a pension of 1,130 euros whilst female pensioners received an average of 653 euros (gross pension). [16] There are great differences between the genders, the average pensions of women are significantly lower than men's pensions. It should be noted that these are average figures, but the data shows, retirees receive much lower income than full time employees. Furthermore retirees often select an expensive "offline current account".

6. Disadvantage of the seniors

Pensioners often earn considerably less than full time employees, they often have no Internet and they more often select more costly, personnel intensive, current accounts. Banks have significantly increased their fees for current accounts in recent months. They argue that they "must" do this because the interest rate margin is very low and the general interest rate is also very low. The Deposit Facility even has a negative interest rate of -0.4%, this is the main argument for increasing the fees.

So the question arises: What would be the impact, were the commercial banks not to have increased their fees in this manner but, instead, passed this negative interest rate (-0,4%) on to their customers? We will determine the amount of the "penalties" if retirees receive a certain receipt of

money into their account and this money remains on the current account for an average of one month. How much would be the "penalty interest"?

The formula for the calculation of interest is:

I = M * i * 30 / 360
I = Interest, M = Money in the current account. In Germany you calculate 360 days for the whole year and 30 days for each month.

Unfortunately, there is no public data on how high the volume of money in the current accounts of retirees is, so some comparative calculations, with several assumptions, are made.

Firstly: You have different receipts of money and it is assumed, that this money is on the current account for one month. If you have a receipt of money of 1,130 Euros monthly (average male pension), then you would have to pay 0,38 euros, if the negative deposit rate would be passed on "one to one" to the customer. (see table 3) Now we compare it to an "all inclusive current account" which costs 9.90 euro per month. The (nearly) accurate fees are, of Postbank: 9,90 euro, Commerzbank: 9,90 euro and Deutsche Bank: 9,99 euro. So the fee is significantly higher than in the situation in which the negative deposit rate would be passed "1 to 1" to the customer. In the case that the person is a customer of the Postbank, then the fee is 0 euro, if receipts are 3,000 Euro per month. If you receive money of 29,700 (!) euros per month, then you have to pay 9.90 euros if the negative rate were to be passed on, one to one, to the customer – an amount of money which hardly any pensioner receives.

Receipt of money (per month)	Negative deposit rate: - 0,04%	Current account fee
100 euro	0.03 euro	9.90 euro
200 euro	0.07 euro	9.90 euro
500 euro	0.17 euro	9.90 euro
1,000 euro	0.33 euro	9.90 euro
1,130 euro	0.38 euro	9.90 euro
2,000 euro	0.67 euro	9.90 euro
2,999 euro	1 euro (nearly)	9.90 euro
3,000 euro	1.00 euro	0 euro
29,700 euro	9.90 euro	0 euro

Table 3: Comparison: Negative deposit rate and actual Postbank fee "Postbank Giro extra plus"

The question arises whether or not it is unrealistic to assume that all of the money is in the current account for one month. The core statements do not change if some other assumptions are made. Second assumption: The pensioner receives the money evenly over the entire month. Then the current fee is still 9.90 euro. The average balance on the current account in this case, as mentioned above, is then 1,130 ÷ 2 euro = 565 euro and the negative deposit charge would be 0.19 euro. The actual fee (9.90), is higher. Furthermore it seems unfair for retirees. Similar is the situation if the customer draws the entire money on the day of receipt (third assumption) then he would be charged, like the deposit rate, and has to pay 0.01 euro. The Postbank fee is 9.90 euro.

7. Result

Due to the severe economic situation in many southern countries the ECB has dropped the interest rates to an historically low level. The deposit facility rate now is negative (-0,4%)! The margins are very low. So a lot of commercial banks have increased their current account fees, especially for those customers who make their bank transactions off line. A lot of retirees do not use the internet

and they receive only low pensions. The increase in the accounting charges by many banks, in recent months, seems therefore to be unfair for them. They are burdened with higher fees. A charge in the form of an amount of negative interest would be a much more favorable solution for the retirees. Due to the fact that they earn not much money and that they rarely use the Internet, they are disadvantaged.

8. References

[1] European Central Bank, The Monetary Policy of the ECB, 2011, p. 64, Source: https:// www.ecb .europa .eu/pub/pdf/other/monetarypolicy2011en.pdf

[2] Eurostat, http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=de&pcode= tec00118&plugin=1

[3] Eurostat, http://ec.europa.eu/eurostat/tgm/table.do?tab=table&plugin=1&language=de&pcode =tsdec450

[4] Eurostat, http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&language =de&pcode=tec00115

[5] European Central Bank, The Monetary Policy of the ECB, 2011, p. 108, Source: https://www. ecb.europa.eu/pub/pdf/other/monetarypolicy2011en.pdf

[6] Key interest rates, Source: Bundesbank,https://www.bundesbank.de/Redaktion/DE/Down loads/Statistiken/Geld_Und_Kapitalmaerkte/Zinssaetze_Renditen/S510TTEZBZINS.pdf?__bl ob=publicationFile

[7] European Central Bank, The Monetary Policy of the ECB, 2011, pp. 58, Source: https://www. ecb.europa.eu/pub/pdf/other/monetarypolicy2011en.pdf (S. 58ff)

[8] Bain & Company; Retail-banking, Die digitale Herausforderung, 2012, p. 8, Source: http:// www.bain.de/Images/Retail_Banking_II_Digitalisierung_ES.pdf

[9] Bundesbank, Zahlungsverhalten in Deutschland 2014, Dritte Studie über die Verwendung von Bargeld und unbaren Zahlungsinstrumenten, p. 26 ff., Source: https://www.bundesbank.de/ Redaktion/DE/Downloads/Veroeffentlichungen/Studien/zahlungsverhalten_in_deutschland_2 014.pdf?__blob=publicationFile

[10] Bankenverband deutscher Banken, Seniorenstudie 2014 Finanzkultur der älteren Generation, p. 29, Source: https://bankenverband.de/media/files/Seniorenstudie_.pdf

[11] GfK Marktforschung, Nürnberg, im Auftrag des Bundesverbands deutscher Banken Initiative D21 2016, D21 – Digital – Index, p. 25, Source: https://www.bertelsmann-stiftung.de/ fileadmin/files/BSt/Publikationen/GrauePublikationen/D21_Index2016_WEB-final.pdf

[12] Source: focus, http://www.focus.de/finanzen/banken/finanztest-diese-25-girokonten-sind- noch-kostenlos_id_5974345.htmlMany

[13] Postbank offers, Source:https://www.postbank.de/privatkunden/docs/Kontovergleich.pdf

[14] Deutsche Bank, List of prices and services of Deutsche Bank, Source: https://www.deutsche-bank.de/pfb/data/docs/ser-konditionen_preise-preisaushang.pdf

[15] Commerzbank, Preis- und Leistungsverzeichnis, Source: https://www.commerzbank.de/portal/media/efw-dokumente/preis_leistungsverzeichnis.pdf

[16] Rentenversicherung in Zahlen 2016, Deutsche Rentenversicherung, Source: http://www.deutscherentenversicherung.de/cae/servlet/contentblob/238692/publicationFile/61815/01_rv_in_zahlen_2013.pdf

DIGITAL DIVIDE IN THE EU COUNTRIES FROM THE DANUBE REGION

Sorin Dan Şandor[1]

Abstract
The paper analyzes digital divide in the EU Countries belonging to the Danube Region. Based on data from Eurobarometer 84.2 October 2015, digital divide (both in terms of access and usage) is assessed and then discussed in the light of the evolutions of digital divide in the last ten years for the countries from the region as reflected by Eurostat data. The influence of the most important factors mentioned in the literature (age, education, gender, rural-urban split, socio-economic status) is analyzed for each country.

The results show us that digital divide, while declining, is still of concern in the area. We found that age is a common factor for digital divide in all the cases and education is not influencing the digital divide in any of the countries in discussion. For the other factors their influence varies from country to country.

1. Introduction

Digital divide might be defined in many ways, each suggesting a different approach in measuring it. The main components of possible definitions are:

- access to digital resources like the Internet (later being supplemented with the quality of access-broadband or not);
- computer literacy (knowledge and skills to use computers and similar digital devices);
- usage (distinctions are made from the most simplistic as use/not use to more precise measurements of the level of sophistication in usage).

Computer literacy is starting to become less and less important. The technologies used for access are becoming simpler every day – if at the beginning of the global network in order to have access in-depth knowledge was required, now even toddlers might be able to access digital content over the Internet.

Usage or sophistication is another issue – the way in which information is dealt with is depending primarily on the needs and wishes of the user. Brandtzæg et al [1] identified five user types: Non-Users, Sporadic, Instrumental, Entertainment and Advanced Users, considering the first two categories as being affected by digital divide. Sophistication is measured as the number of different purposes for using the Internet. Things are not as simple – the results may be explained by users' choices – they might decide to use or not to use a specific tool or use only some of its features. Needs are one determinant of usage – if someone needs to access electronic public services than the sophistication of usage might increase, but otherwise it stay at a lower level. Computer literacy

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might be another factor – more knowledge might bring more sophisticated usage, but not exactly in terms of more ways of using the Internet. A survey made in Netherlands showed that people with low level of education are using the Internet more than the rest of the population [5] and the difference in the type of usage is that the lower educated use the Internet more for gaming and social interaction and less for information and for personal development than the higher educated but they are still sophisticated enough – in the terms of Brandtzæg et al [1].

For the purpose of this paper, while acknowledging that digital divide is a complex phenomenon we will adopt an operational definition – digital divide is about access to Internet. We identified two groups: people who did never accessed the Internet (because of lack of connection or from other reasons) and people who did.

The factors that are influencing digital divide are many. Different sets of factors are mentioned, such: socioeconomic status, gender, life stage (age) and geographic location (affluence of the region) [2], or income, education, age, gender, ethnicity, and geographical location [10]. Tsatsou [9] is presenting a review of socio-cultural parameters that influence the decision to adopt digital technologies.

2. Methodology

The data used for our analysis was gathered through EUROBAROMETER 84.2, October 2015.
We selected the data concerning EU countries from the Danube Region: Austria, Bulgaria, Croatia, the Czech Republic, Germany, Hungary, Romania, Slovakia and Slovenia.

Digital divide was measured using the answers to the question D62 from the questionnaire regarding the use of the Internet, values like „Never" or „No Internet access" are used to identify people which never accessed the Internet, the "digitally excluded".

The Eurobarometer gathers data for the main factors mentioned in the literature: age, geographic location (country and type of community), gender, education and income. Accordingly the hypotheses of the study are:

1. Age influences digital divide;

2. The type of community is influencing digital divide;

3. Gender influences digital divide;

4. Education is influencing digital divide;

5. Financial situation is influencing digital divide.

Binary logistic regressions were performed for each of the countries in order to identify the existence and the nature of stated relationships. Binary logistic regression estimates the probability that a characteristic is present (in this case digital exclusion) given the values of explanatory variables (age, type of community, gender, education and financial situation). The choice of this method is also influenced by the fact that variables are measured at different levels - age and education are measured at scale level, the type of community and the financial situation (measured as difficulty in paying the bills) at ordinal level and gender at nominal level.

3. Findings

3.1 Dimension of the digital divide

The number of the digitally excluded (people which did not access the Internet) ranges between one fifth of the population over 15 years and almost one half, indicating a serious extent of the phenomenon. We can see that the richest countries are faring better (Germany and Austria), while poorer countries (Bulgaria and Romania) are the last. Other researches have different data for the number of people that never used the Internet. Eurostat is reporting, based on data from the surveys of the national statistics institutes a much lower figure. One possibility for the lower figure is that only people under 75 years are included in such statistics or people over 75 are in a great proportion digitally excluded. In our data people over 75 years are representing 8.1% of the entire sample, but 20.5% of the people that never accessed the Internet (more than half of them - 56.5%). Also it is unclear if people with no access were reported as having never accessed the Internet – in Eurobarometer No Access and Never are two different values of the Internet access variable. Eurostat figures are, except some cases (Slovakia and Hungary or Romania and Bulgaria are switching places), confirming the ranks that countries have from the point of digital divide.

Country	Digital exclusion	Individuals that never used the Internet (Eurostat, 2016)
DE – Germany	20,3%	8%
AT – Austria	28,8%	13%
CZ – Czech Republic	30,3%	13%
SI – Slovenia	30,3%	22%
HR – Croatia	34,0%	23%
SK – Slovakia	34,9%	15%
HU – Hungary	36,3%	19%
BG – Bulgaria	44,0%	33%
RO – Romania	48,7%	30%
Total	27,3%	-

Table 1: Dimension of the digital divide

Eurostat figures are helping us to see that the region is lagging behind the rest of the Europe. The average figure of EU-28 is 14% - only three countries from the region are better than the average, Germany being only the seventh in the EU; Romania and Bulgaria are the last in the ranks.

Internet access is becoming less and less problematic. The percentage of people not having Internet at all ranges from 3.4% in Germany to 14.6% in Bulgaria. At European level most common mentioned reasons for households not having internet access are that it is not needed (46 %), they lack the skills (41 %) or the equipment (27 %) or access (23 %) costs are too high [4:6].

The digital gap at country level is smaller now than it was ten years ago. The biggest increase in terms of Internet users was in Romania, followed by Bulgaria and Croatia. EU-28 has a better rate than EU-15. In some areas the new EU member states have better indicators than older states. Romania leads in terms of ultrafast (at least 100MBps) broadband [4:19). The country with the biggest proportion of internet users on social networks is Hungary with 83 %, Romania (together with two other states) follows with 78 % of users and Bulgaria is only two percent behind. (4:14). Still, the digital economies of the less developed countries in the EU are lagging behind, Bulgaria

and Romania being the last. The Danube Region has only two countries with digital economies above EU-28 average – Germany and Austria. The economic factor is important. James [7] found that in the developing countries where incomes tend to be relatively high the divide is falling, which also is the case for the poorer member states of the EU.

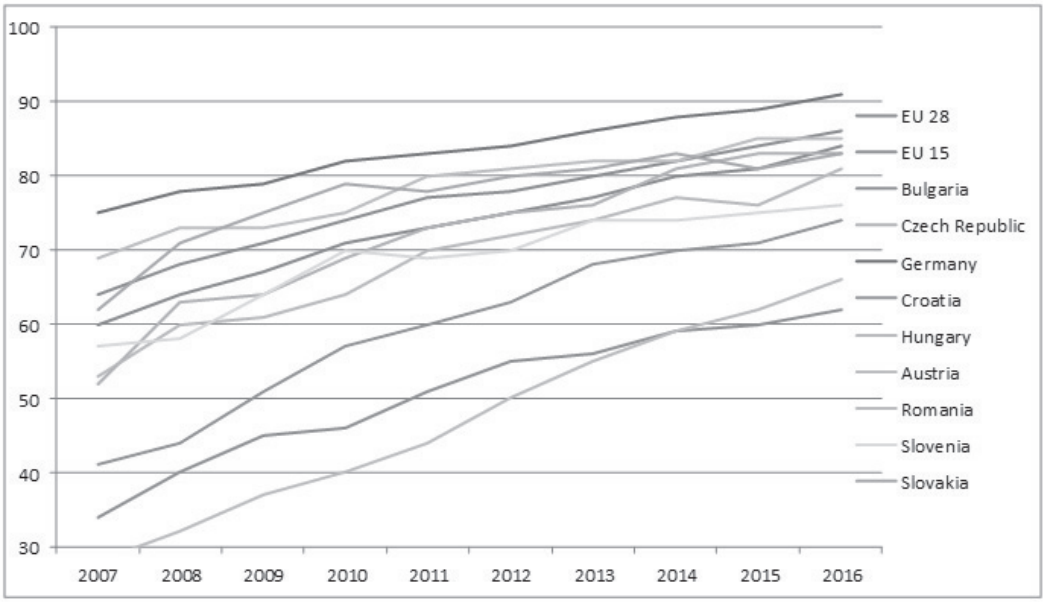

Figure 1: Evolution of the number of Internet users (source: Eurostat)

3.2 Profile of digitally excluded

How do people that have never accessed the Internet look like? Some characteristics are presented in the table below.

Country	Age (average)	Gender (% of men)	Rural (%)	Small/middle town (%)	Financial difficulties (%)	Education (% that left school before 15 years)
AT - Austria	66,11	48.7	34.9	35.4	5.8	44.7
BG - Bulgaria	63,35	46.9	31.0	40.2	39.2	24.7
CZ - Czech Republic	62,54	40.1	25.1	52.0	11.3	9.2
DE - Germany	70,02	39.8	34.7	44.3	2.5	49.4
HR - Croatia	62,20	42.1	51.0	26.9	18.4	27.3
HU - Hungary	65,30	42.2	15.6	61.8	12.0	43.6
RO - Romania	60,71	43.6	56.4	28.0	9.4	34.6
SI - Slovenia	70,39	37.7	48.7	28.9	17.1	33.1
SK - Slovakia	64,77	39.2	52.5	35.4	13.4	16.5
Total	64,87	42.2	39.9	39.0	14.8	32.0

Table 2: The profile of digitally excluded

This profile indicates a population which is old, mostly composed of women, living in rural or small cities areas, which have often financial difficulties (measured as having problems paying their bills). With the exception of the former Czechoslovaks, their education level is rather low. The variations among the countries are not far from expected (with the exception of the percentage of people reporting financial problems in Bulgaria).

3.3 Determinants of digital divide

Table 2 is suggesting that all five hypotheses might be confirmed.

A logistical regression for each of the countries was used in order to identify the existence and the nature of the relationships mentioned in the hypothesis.

The model has a good explanatory power as the values of Nagelkerke R-square are around 0.4-0.5 for all the regressions. The results are expressed in terms of odds (a value of 1.10 indicated that the chances of being digitally excluded are increasing 1.1 times than the rest of the population). Only significant values ($p<0.05$) are represented.

	Age	Gender (Men)	Rural	Small or middle sized city	Education	Financial situation	Nagelkerke R-square
Austria	1.15		1.79	3.40		2.73	0.473
Bulgaria	1.18		3.15	2.46		3.47	0.491
Croatia	1.16					3.25	0.522
Czech Republic	1.12					2.16	0.506
Germany	1.10	0.67				2.09	0.526
Hungary	1.12	1.63	2.62	2.33			0.448
Romania	1.13		3.88	2.11		2.63	0.484
Slovakia	1.13					9.29	0.437
Slovenia	1.15					2.42	0.509

Table 3: Factors affecting Digital Divide (odds)

Hypothesis 1 is confirmed for all the countries in the region – age is influencing the chances to be digitally excluded. There are very few cases of young people that do not have access or that never accessed the Internet. For older people chances to be included in this category are increasing, for persons over 75 the odds becoming higher than 50%. The strength of the relationship is fairly similar in all countries (ranging from 1.10 to 1.18).

Hypothesis 2 is confirmed for four different countries: Austria, Hungary, Bulgaria and Romania. The high odds for Romania and Bulgaria are showing us that we will find very high occurrence of digital exclusion in the rural areas (in line with other data concerning the divide between rural and urban areas). Smaller figures are for small and middle sized cities. In Hungary the divide is smaller. Austria is presenting an interesting puzzle – the highest odds for digital exclusion are for people from small and medium sized cities.

Hypothesis 3 is confirmed only for two cases – Germany – where if you are a man decreases the odds and Hungary where we see an increase. We saw that the share of female digitally excluded is higher than their share in the general population. This is a common findings of such studies and led

to the different attempts into explaining, like Cooper [3] suggesting that the digital divide is fundamentally a problem of computer anxiety whose roots are deep in socialization patterns of boys and girls. Van Dijk and Hacker [10] are showing that in the course of the 1990s the gender gap in the possession of ICTs has started to close. The results in this study may be closer to those obtained by Hilbert [6]. In a study concerning developing countries the relationship between gender and digital divide was proven to be a spurious one, employment, education and income being the reasons why gender and digital divide are correlated. In our case age might be one of the alternative explanations. We saw that older generations are more digitally excluded and we know that women are better represented among older generations so the higher proportion of women among digitally excluded might only represent their higher proportion among older population.

Hypothesis 4 is not confirmed for any of the countries in the region. A cross-tabulation between education and digital exclusion is showing significant but weak relationships for all the countries except Germany, Austria and the Czech Republic. In the logistic regression (where the influence of other factors is taken into consideration) the significance disappears. This is largely counter-intuitive – as education is seen as a factor influencing social divides. In the case of digital use this explanation might not work. Using the Internet is simpler every day and there is no need for a lot of education in order to be able to do it. People with no formal education are more prone to be digitally excluded, but their number in the sample is too small in order to have a significant relationship. The relationship between Internet use and education is not as expected – the already mentioned study of Helsper and van Deursen [5] shows that people with low level of education are using the Internet more than the rest of the population.

Hypothesis 5 is confirmed for all the countries, except Hungary. People who often have difficulties in paying their bills (the proxy used for financial situation) are more likely to be digitally excluded. By taking another proxy – class, we see that the highest occurrence of digital exclusion appears for the working class (53.1% of the entire sample), much higher than for the lower class (28.4%). The problem is that class identification is highly subjective and it is influenced by age – older persons are more likely to identify themselves as belonging to the working class than the rest of the population.

Several of these factors are affecting digital divide in specific ways for each country. In order to provide further explanations more knowledge about the specificities of these countries is needed knowledge which the author of this paper does not possess. Why gender seems to influence digital divide in a certain way in Germany and in another one in Hungary is a question which needs more in-depth knowledge of those societies and other finding need similar knowledge.

4. Conclusions

Van Dijk and Hacker [10:321] identified four different positions regarding digital divide:

1. Denial of the existence of a digital divide.

2. Acceptance of some present divides, claiming that they will soon disappear.

3. Emphasis of digital divides that are supposed to grow and come on top of old inequalities based on income, education, age, gender, ethnicity, and geographical location.

4. Differentiation: some gaps are decreasing while others grow.

The findings of this study are showing that we cannot deny the existence of the digital divide in the region - it is quite significant. The dimension of this divide is decreasing in a consistent way in the last 10 years. The countries at the bottom do have the more consistent increases in the rate of Internet users, but the gap is not closing in a fast enough pace and there are no prospects for closing the divide.

Only some old inequalities are influencing the digital divide. Across the entire region we see differences among countries, more affluent countries exhibiting a smaller digital divide.

Age is the only factor affecting in a consistent and similar way all the countries from the region. It affects mainly the older generations, younger ones being more digitally included. Sung [8] suggests that smartphone use reduces the digital divide across age, education level, occupation, and income levels. Today 43 % of the Europeans (aged 16-74 years) use their mobile phone to access the internet [4:15].

Gender-based divide is a significant only in two cases (and in different ways). Comparing the rates in which the percentage of men and women which never used the Internet is decreasing we observe that in each country from the region the percentage of men is decreasing a little bit faster than in the case of women (Eurostat), the same happening across EU-28. This might be worrying - such a trend, if continued, may generate a new gender-based divide even in country where it is not significant. But if we do compare the rates in which digital divide is reducing based on gender and age we can see that women aged between 25 and 64 have better rates than men of the same age in all countries from the region except Slovenia – so the gender divide (if existing) is closing.

The type of community seems to add digital divide to already existing divides between big and small communities in another four countries – but rather existing divides are behind the existence of the digital divide across this line. The trend in the evolution of digital divide is in the favor of reducing this line of division – the advance in the number of Internet users in the last ten years (source Eurostat) is the biggest in sparsely populated areas (less than 100 inhabitants/km²) then in intermediate urbanized areas (between 100 and 499 inhabitants/km²), the smallest advance being in densely-populated areas (at least 500 inhabitants/km²). Basically this supports a path-dependency explanation – new technologies arrive and are embraced in big cities, then spread to smaller cities and in the end arrive in villages. In the more developed countries such a phenomenon happened several years before, while in less developed countries from the region thing are happening in the last years – but at a very big speed (in Romania the number of Internet users from rural areas has increased 4.91 times in the last 10 years, in Bulgaria 2.3 times).

Regarding income the evolutions of digital divide in the last five years (Eurostat has data only for this period, and for Croatia only for the last two years) are indicating a reduction of the gap in terms of Internet use for people living in households with income in the first (the biggest increase) and second quartile.

There are only small indications of new digital divides. Some authors [5] claim that digital divides are shifting into differences of usage. The information rich are using the Internet less but better than the rest. But this is something that was true for any kind of media – books being only one example.

5. References

[1] BRANDTZÆG, P.B., HEIMA, J. and KARAHASANOVIC, A.: Understanding the new digital divide—A typology of Internet users in Europe, in: International Journal of Human-Computer Studies, no. 69, 2011, pp. 123–138.

[2] CHEN, W. and WELLMAN, B.: The Global Digital Divide –Within and Between Countries, in: IT&Society, 1:7, 2004, pp. 18-25.

[3] COOPER, J.: The digital divide: the special case of gender, in: Journal of Computer Assisted Learning, 22:5, 2006, pp. 320–334.

[4] EUROPEAN COMMISSION, Connectivity. Broadband market developments in the EU, Europe's Digital Progress Report 2016.

[5] HELSPER, E.J. and VAN DEURSEN, A.J.A.M.: Do the rich get digitally richer? Quantity and quality of support for digital engagement, in: Information, Communication & Society, published online, 2016, pp. 1-15.

[6] HILBERT, M.: Digital gender divide or technologically empowered women in developing countries? A typical case of lies, damned lies, and statistics, Women's Studies International Forum, 34(6), 2011, pp. 479-489.

[7] JAMES J.: Are Changes in the Digital Divide Consistent with Global Equality or Inequality?, in: The Information Society: An International Journal, 27:2, 2011, 121-128.

[8] SUNG, W.: *Digital Government and Wicked Problems: Solution and Problem*, Information Polity, 21:3, 2016, pp. 291-306.

[9] TSATSOU, P.: Digital divides revisited: what is new about divides and their research?, in: Media, Culture& Society 33:2, 2011, pp. : 317-331.

[10] VAN DIJK, J. and HACKER, K.: The Digital Divide as a Complex and Dynamic Phenomenon, in: The Information Society, 19:4, 2003, pp. 315–326.

eDemocracy I

Limitations of the e-Participation

Uroš Pinterič[1]

Abstract
e-Participation was considered to be proper solution for the long term decline of political participation at different levels. However, recent events show that there is very limited space for the political participation, which is considered to be functional. The paper explores the changes in citizens' participation after the introduction of different e-Participation/ e-Democracy tools. Based on the results we want to justify the need to redefine the idea of ICT-supported participation and critically assess it, since no systematic change is visible in the patterns as well as in the actions of individuals. The basic observation can be formulated in the sense, that the ICT tools predominantly facilitate the participation of those who would actively participate in the first place, but they do not increase activation of those people, who are refusing to participate.

Key words: *e-Democracy, e-Participation, digital divide, political divide.*

1. Introduction

e-Participation was considered for a long period of time one of the main advancements in the political participation of citizens in decision-making processes at different levels and in different forms[e.g. 1, 18]. Political participation, supported by the use of information and communication technologies, is often limited in abilities and effects. On one hand, there are legal limitations, which are defining what types of activities are considered to be allowed [cf. 6, p.528-535]. On the other hand, there are technological limitations, which can start with digital divide [e.g. 2, 11,18] exclusions of certain specific populations and at the same time, the designed solutions are often partial and strongly directed in a certain way or towards certain process entry points.

All in all, different limitations are reducing the potential of participation as well as they are diminishing the impact of such participation within the classical political processes. In the paper, we are trying to indicate different reasons of relatively limited participation in relation to the possibilities that are offered and were indicated by different researches.

The paper is predominantly concentrated on the information, which is available for Slovenia, as a post-transition country, where the democratic processes were intensified over the last historical period.

As it was indicating by different scholars new ICT tools shall accelerate the political participation and thus promote the more effective and less discriminatory decision-making [cf. 20, p.228, cf. 21, p.1786]. The positive results are to some extend achieved in individual countries, such as Estonia or even Slovenia [23], but many cases show the main problem, that the political participation is predominantly limited to the activities which are benefitting the government and much less the citizens [cf.12, p.178, 22, cf. 25, p. 238-239].

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Such attitude in the case of Slovenia was analysed already in the past [e.g. 22, 23, 24], when it was established that the e-services, designed for the citizens in many cases do not provide any specific benefits for the majority of population who would potentially use them. Not only that the digital divide was only partially addressed, but even when it was addressed it was done in repressive manner, when the government or the governing authorities opted out all other possibilities of the provision of services, forcing the subjects to adapt (by learning, digitalization or by increasing the costs, if they decided to outsource the necessary activities to those who had/have capacities to provide proper services) [22].

2. Methodology

The paper is based on combination of literature review, providing the understanding of the context, collected data from the research on smart cities, which was conducted in order to assess the human limitations on acceptance the smart cities in Slovenia and Slovakia and which indicated somewhat confirmed the weak preparedness of the citizens to get involved in different political processes.

3. e-Tools in the political processes

The information and communication technologies have different forms of penetrating the classical political processes. Primary they are seen as tools to reintroduce direct democracy (in one form or another) and to overcome representative democracy which is connected to the issue that the number of citizens willing and able to participate exceeds the possibility for the effective decision-making as well as it jeopardize the daily work of the people with the right to participate [e.g. cf.17, p.30, 18, 19]. Despite there are different approaches to classify democratic functionalities as well as tools of e-participation [13, cf. 14, p.1-2.], we can argue that the tools of participation can be listed as those of political and of policy participation (it is possible also to indicate the administrative participation as specific category). As for the nature of the use of the e-Participation tools, we can separate the tools which are supporting the existing power relations and those, which are reshaping the power relation (partially or in whole). In all cases the main point is not the technological viability but predominantly the probability of the acceptance by different groups (this part will be additionally examined in the next part of the paper.

	Politics	Policy	Administration
Status quo	e-Voting	e-Deliberation	e-Forms
change	e-Legislative process	e-Policy definition	e-Procedure

Table 1: Forms of e-Participation by change of the power and field of influence

The table 1 above shows different forms of e-Participation in different fields of state activities with different levels of the effect [7, 9]. For the e-Optimists, it might be rather unconvinced, but in the next lines, we are trying to provide arguments, why only certain forms of participation provide actual change of the political participation [6, 7]. The status-quo activities are rather unproblematic from the perspective of the authorities, since they do not represent the direct power shift towards the citizens [2, 3]. On the other hand, activities marked as "change" represent the need for the power shift from the established political (or elitist in general) structures towards the public [5]. The known practices in the most democratic states avoiding the changes which could reduce power of the elites over the course of the society [cf. 22, p. 39, 47]. If we take into the account the European political power (composed of governments and parliaments, we can argue that the normal size of

the government is about 15-20 ministers, while the normal size of the parliament varies between over 800 and 24[2]). Based on the number of representatives and size of the population, we can assume that in any country number of those entitled to political participation and interested in particular matters will exceed the number of representatives. This assumption includes the idea that any decision accepted by greater majority than one, which could be reached by given number in representative body, consequently providing greater legitimacy (especially in unicameral political systems). The main obstacles are connected to the inevitable need to take decisions on day to day basis, which would create automatised voting or poorly elaborated decisions. This automatically leads to the conclusion that e-Participation is not the tool for day to day involvement of the citizens in the political and policy decision-making [5, 13]. And this is one of the core pillars of elitist defense of existing representative democracy, with limited inclusion of the population in the governing processes[3].

Taking into the account aforementioned arguments and the table 1 we can provide following explanation of the later. e-Voting does not provide any actual change in the system of voting, but only enables population to change the voting method or the initial model of the representation, which would jeopardize existing representative model. The practice in the countries with introduction of e-Voting did not realize significantly different levels of voting participation which would dramatically change the electoral result.

e-Deliberation as policy related method is rather well accepted among democratic governments. However, it is simultaneously also easily ignored by the citizens (who do not recognize the need to participation in the public debates), as well as by the governments who have very limited interest to include the public suggestion (dismissing them as uneducated or illegitimate) [9, 13, 16].

e-Forms as initialization or even finalization of the administrative procedures are rather well accepted by the public as well as by the administration, due to reduced bureaucratic burden on both sides. However, they are simplifying the initial communication, while in most cases they do not provide any deeper added value than time relaxation [e.g. 20, 21].

On the other hand there is set of different forms of participation which could potentially change the politico-administrative procedures as such. In the political dimension this would be e-Legislation where citizens, based on the pre-prepared legislative draft discuss in online forums, reach certain compromise and vote on the propositions which became afterwards laws. Less demanding version is the general popular e-Vote on prepared draft laws. Such model would make the parliaments as decision-making bodies redundant. The legislative preparatory step can be done also without the governing authorities as a combination as expert knowledge and people participation, which shall be included at least in the manner of clear indication how individual ideas/contributions were included into the preparatory process. Somewhat similar procedure we can find in the European legislative procedure, which however strongly minimizes the actual effect of different ideas on the final result.

The e-Procedures can be understood as administrative procedures, where the classical administration could be removed or reduced to the minimum, with the most of the activities transferred to the logical code which would be able to resolve most common requests with high level of reliability [20, 21].

[2] If we include House of Lords in UK and Monaco
[3] Including introduction of police state methods [8] in order to maintain the exisitng structure of the world [10].

Providing these short descriptions of how to navigate the ideas we can start to think the possibilities given to the people by the states and what are the options that citizens usually choose. The basic characteristic between change and status quo e-Tools (activities) is that those activities, which are considered to be change, mean different approach in the processes themselves. In this manner the nature of the processes change, e.g. provides more involvement of the citizens (primarily), improves the legal predictability of the outcomes, reduces the process time frame, or increases the efficiency of the services. On the other hand, status quo activates are only digitalized basic activities with no other change in the process or outputs. In this perspective e- Voting can be considered simple possibility of electronic vote, without the change in the voting regulation/rights (the most common case is the work of modern parliaments, where raising the hand/card was replaced by pressing the appropriate button, without any actual change of the legislative process as such). On the other hand E-Legislative process changes the nature of the legislative process as such (up to the point that there is no need for political representation). However, in most cases it can be considered the legally provided opportunity to the citizens to way in with their suggestions, comments, which shall be taken into the consideration by the legislative body or even direct public vote on the legislation. Only ICT made such ideas (on deliberative and/or direct democracy) possible. In this manner, it is possible to say that exclusion of the citizens from the legislative processes cannot be considered the question of management, but it became question of political power relations.

4. State opportunities for the participation

Within the definitions, set up in the previous part we can try to assess any state in its performance while delivering the e-Participation opportunities to the citizens. In the case of Slovenia, we can rather easily establish that in the field of the politics, Slovenia is leaving the citizens out of its scope, since there was not done much next to the debate to introduce e-Voting as secondary electoral method. The debate was blocked between fears from no control over the possible electoral fraud (open code approach) and too much control (where the owner of the code could set the result without anybody else noticing) [cf. 22, p. 61-62, 23]. The idea on abolishing the parliament and to switch to public decision-making is far-fetched and contextually dismissed by the political elite that citizens have no proper knowledge to run the political debate and decisions (which systematically denies the fact that there is general passive and active voting right of all citizens of age).

Similarly negative approach Slovenia shows in the field of the e-Policy definition, where citizens are predominantly excluded from shaping the public policies. They are allowed only in two major cases, of activities; "asking the government", where citizens have the option to address the question to the public authorities regarding certain broader situation or to propose certain solution. In this setting most of the solutions are dismissed as in conflict with broader legislation or other policies. Second option is so called public debate on the legislation, which shall be taking place in the procedure of reaching broader consensus on draft law before starting the parliamentary procedure. The major criticism is connected to the negative attitude towards opinions which are not in line with the presented text, which means that the public debate is pro forma debate, with practically no influence on the draft law before entering the procedure. Additional criticism is connected to the situations when the draft law might draw on broader attention, when the announcement of the public debate is hidden in order to exclude broader public as much as possible. This, rather predictable approach to the public contribution towards improvement of the legal solutions is highly discouraging and demonstrates the power of political elitism in ignorance of the public opinion.

e-Forms as non-problematic form of the administrative e-participation are widely supported and used in all possible forms since they reduce the administrative burden of civil servants [23]. In this

manner sometimes the administrative institutions go even step too far, by immediately offering the online solution, also in the cases when it is assumed that the customer has a problem with internet and legal navigation. The solution "information is available on the Internet" is usually not the proper first response to the customers who came personally in the office in their matter. The administrative procedures transformation in the e-Procedures is, on the other hand, rather unappreciated, since it would cause erosion of the administrative power. One of most effective cases that could take place in Slovenia would be construction permit electronic procedure, where e-Plans would be entered to the system by the architect, decision would be processed based on the predestined values of the parameters and automatically issues. State is collecting all necessary information today in the electronic form and the process would shorten for the clients from (now often more than six months to the same day decree. Civil servants would deal only with the more demanding cases, where construction is planed out of allowed proportions, and with possible complaints, where non-algorithmic decision-making is needed [20, 21]. However, this would reduce their bureaucratic power to prolong the procedure, to reject the project which is within the predefined norms or, on the other hand, to blindly confirm the project which shall not pass, but is of political interest.

5. Citizens' reaction to the e-Participation possibilities

From the situation described above, it seems that the state is the sole responsible for the almost non-existing e-Participation of the citizens in different processes. Within the comparative research between two central and eastern European cities we tried to understand the peoples' perception of different elements connected to the use of the information and communication technologies in the communication with the authorities [cf. 15, p.86-87]. The Slovenian sample was acquired in the second largest city (in order to avoid the effect of the capital city and to assure predominantly urban structure of the population), where 150 random people were stopped to fill in the questionnaire. The basic purpose of the research was to understand the citizens' ability/preparedness to use ICT in order to make smart cities reasonable investment in the future. The background assumption is that any e-Tool should have proper support in the society or it will be non-functional[4].

General picture is that people are technologically well equipped and in general, they have access to the internet. Based on the research data, the Internet as well as email is daily used in over 50% of the cases. On the other hand more than 37% of respondents never used e-Banking while many respondents do not even know what the e-Government is. This indicates the distance between citizens and state in the virtual environment.

Concerning the use of the mobile phone, almost all respondents use it for calling and texting. When it comes to the use of the mobile phone for other activities such as net browsing, email use, mobile banking or administrative purposes, surprisingly less than 30% of respondents are using mobile phone for such activities. About 30-40% of the respondents use the mobile phone for fun.

From this perspective, one can argue that citizens are not interested in using modern technologies for more demanding tasks, which would include also political or administrative participation.

[4] There is also another option; legally binding decision that e-Services shall be used. Slovenia opted for this in the case of corporate taxes, demanding that any legal person (regardless of form or size) organizes tax reporting via system of e-Taxes. Legally this represents opression in the sense of defining the way to "communicate" with the state. Economically, this decison increased the expenses for small legal entities with limited revenues and financial capapcity, which were in the past able to run their accounting books on their own and were in many cases forced to hire accounting services due to the new regulations.

The use of the Internet and email is strongly and statistically significantly connected with age, education and work. Both e-Government and e-Banking are strongly and significantly connected with work (in all cases, the Pearson correlation coefficient is between 0.35 and 0.6 with the correlation significant at the 0.01 level). On the other hand, such significant correlations are achieved in the multi-tasking use of mobile phones only in the case of age. In other cases, although significant, the correlations are weaker. In general, we can say that younger, better educated and better employed people will use the Internet more diversely. In the case of the mobile phone, younger people will more likely use it for different purposes, while older people are using them predominantly for calling [cf.15, p. 87].

Over 60% of the respondents are simultaneously concerned how the personal data will be used by the authorities and at the same time about the same percentage of respondents have no problem providing personal data to practically anyone via mobile phone (usually to friends or banks). Alarming information is that 25% of the respondents admitted that they already sent personal information to the people who only claimed the right to access such information. This is not too surprising, based on the attitude of almost 60% of respondents that data shall be provided to the authorities upon request and that almost 15% of respondents believe that the authorities have right to the absolute control of the citizens and almost 50% of those who believe that authorities have right to control suspicious (without defining what this is) activities [cf. 15, p. 89-91].

The data show two major things. First, there is still the digital divide or gap, which is connected to the age, education and work, and indicates that the European efforts for reaching the level of information society are insufficient, at least in the case of Slovenia. As second, the mixed responses regarding the use of the information and communication technologies, e-Services and privacy/control concerns are indicating that the people are not interested in the use of the technologies in more complex manners and that they have also very limited understanding of the possibilities outside classical role of the first generation of advanced technologies (internet, mobile phones) [4, 14, 17].

In the perspective of the e-Participation, it seems that the access to the technology is not the limitation (different statistical data report over 70% coverage of Slovenian population with the internet access), but the e-Participation is limited by the lack of opportunities, lack of social/political engagement and possibly by refusal of given possibilities (such as online petitioning). In this manner, the reasons for the described situation are matter of (political) culture and not technological development/knowledge. In the supportive manner the solution can be provided as additional promotion of the technology, while in the realistic manner the changes shall be made in the political reality, which shall show openness for the participation, including the support to the citizens' suggestions (in opposition to quotation of rules, why something is not possible/allowed).

6. Conclusions

Despite it sounds rather pessimistic, the fact is that there is mutual ignorance of the e-Participation possibilities between politico-administrative structures and citizens. First are avoiding serious information of the processes in order to avoid the inevitable lose of position and power, while later are ignorant to the possibilities that they have, as well as to the political and administrative topics. In this manner one can say that the technology, at least in the case of Slovenia, can be hardly the tool of the modernization of the political system as such. The development of the services and people attitude towards them shows that in this manner Slovenia is traditional state and society,

with unexploited potential regarding the possibility for the transformation in the information society.

Further efforts shall be directed towards the education of the citizens regarding their political duties and rights in the way to improve their political consciousness/culture. On the other hand, as separated process more education regarding the information technologies functioning shall be provided. However, all these efforts will be in vain, unless the state provides actual opportunities for the participation of the citizens (regardless of the channel of the communication), which will potentially result in change of the social processes, including the shift of the political power from the ruling establishment towards citizens.

7. References

[1] 6, P.: *E-governance.* Houndmills, New York. Palgrave Macmillan, 2004.

[2] An ever-deeper democratic deficit. The Economist., 26.5.2012, Available at: http://www.economist.com/node/21555927 (10.1.2016)

[3] BANISTER, F. and CONNOLLY, R.: Forward to the past: Lessons for the future of the e-government form the story so far, 2012, Information Polity, 17, pp. 211-226.

[4] BENNETT, L.: Reflections on privacy, identity and consent in on-line services, 2009, Information security technical report, 14: 3, pp. 119-123.

[5] BOUDREAU, M. C., ROBEY, D.: Enacting integrated information technology: A human agency perspective. *Organization science*, *16*(1), 2005, 3-18.

[6] COURSEY, D. and NORRIS, D. F.: Models of E-Government: Are They Correct? An Empirical Assessment, 2008, Public Administration Review 68: 3, pp. 523-536.

[7] CUNNINGHAM, F.: Theories of democracy: A critical introduction. Routledge, 2002.

[8] CUSING, T.: Even Powering Down A Cell Phone Can't Keep The NSA From Tracking Its Location., 23.7.2013, Available at: https://www.techdirt.com/articles/20130723/12395923907/even-powering-down-cell-phone-cant-keep- nsa-tracking-its-location.shtml (10.1.2016)

[9] DAVIES, T.: 2009, Introduction: the blossoming field of online deliberation, in Davies and Gangadharan (eds.), Online deliberation: Design, Research, and Practice, Stanford: CSLI, 2009, pp. 1-19.

[10] ELLIOTT, L.: Richest 62 people as wealthy as half of world's population, says Oxfam, The Guardian, 18.1.2016. available at http://www.theguardian.com/business/2016/jan/18/richest-62-billionaires-wealthy-half-world-population-combined (18.1.2016)

[11] IFINEDO, P. and DAVIDRAJUH, R.: Digital Divide in Europe: Assessing and Comparing the E-readiness of a Developed and an Emerging Economy in the Nordic Region, 2005, Electronic Government: An International Journal, 2: 2, pp. 111–133.

[12] IFINEDO, P. and SINGH, M.: Determinants of eGovernment Maturity in the Transition Economies of Central and Eastern Europe, 2011, Electronic Journal of e-Government, 9: 2, pp. 166–182.

[13] ISLAM, S. M.: Towards a sustainable e-participation implementation model, 2008, European Journal of ePractice 5, pp. 1-12.

[14] KIM, S. and LEE, J.: E-participation, Transparency and Trust in Local Government, 2012, Public Administration Review, 72:6, pp. 819–28.

[15] KLIMOVSKÝ, D., PINTERIČ, U. and ŠARPARNIENE, D.: Human limitations to introduce smart cities: comparative analysis from two CEE cities, in: Transylvanian Review of Administrative Science, issue 47E, 2016.

[16] LOVAN, W. R., MURRAY, M. and SHAFFER, R.: 'Participatory Governance in a Changing World' in Lovan, Murray, Shaffer (eds.), Participatory Governance: Planning, Conflict Mediation and Public Decision-Making in Civil Society, Aldershot: Ashgate, 2005, pp. 1-21.

[17] MAHRER, H. and KRIMMER, R.: Towards the enhancement of e-democracy: identifying the notion of the 'middleman paradox'', 2005, Information Systems Journal, 15: 1, pp. 27-42.

[18] NORRIS, P.: Digital divide: Civic Engagement, Information Poverty, and the Internet Worldwide, Cambridge, New York, Oakleight, Ruiz de Alarcon, Cape Town, 2001.

[19] OSTLING, A.: ICT in Politics: From Peaks of Inflated Expectations to Voids of Disillusionment, 2010, European Journal of ePractice, 9: 4, pp. 1–8.

[20] PAULIN, A.: Through liquid democracy to sustainable non-bureaucratic government, in: eJournal of eDemocracy and open government, issue 6/2, 2014.

[21] Paulin, A.:Towards Self-Service Government - A Study on the Computability of Legal Eligibilities. *Journal of Universal Computer Science*, Vol. 19, No. DOI: 10.3217/jucs-019-12-1761, 2013.

[22] PINTERIČ, U.: Spregledane pasti informacijske družbe, Novo mesto, 2015.

[23] PINTERIČ, U.: Development of e-government services for citizens in Slovenia: theory and practice. *Eastern European economics*, vol. 48, no. 3, 2010, pp. 88-98.

[24] SVETE, U. and PINTERIČ, U.: E-država: upravno-varnostni vidiki. Nova Gorica, 2008.

[25] WEBER, R. H.: The digital Future -a challenge for privacy?, 2015, Computer law and security review, 31: 2, pp. 234-242.

THE DIFFERENCE OF THE IMPACT BETWEEN FACE TO FACE COMMUNICATION COMPARED TO POLITICAL DEBATES IN CYBER SPACE

Hajnalka Szarvas and Tamás Mező[1]

Abstract

Singularity or …?

The study will reveal one of the most burning questions of the field of e-governance and e-democracy, the question of the Center for Collective Intelligence of MTI, namely How can people and computers be connected so that—collectively—they act more intelligently than any person, group, or computer has ever done before? Is this possible at all? In the study it will be highlighted which are the neuropsychological effects of human to human communication compared to people and computers. Whether this latter is ever able to substitute personal face to face interactions. Are people more satisfied with electronic services where there is an artificial system in front of them? Which kind of psychological impact does it have on political behaviour and especially participation? Does it really encourage to be more active citizens? Or on the contrary it even deters? Which are the criterias of that? And finally in order to be able to answer these questions we should trace this back to the very original question of what is the real function of communication in human society?

1. Introduction

Probably these are the most exciting questions of e-democracy currently which is also studied by the MIT Research Labs.[2]

1.1 Aim of the study

The aim of this study is not fully answer these questions, the research method which leads us further in the understanding of these fields is rather the questioning itself. The critical inquiry as such which reveals more and more component of the topic which is necessary for highlighting the deeper roots of the problem of physical vs. online communication, debates. That way the paper is aiming to provide a more comprehensive view about the complexity of e-democracy processes, mechanisms, the deeper questions and philosophical foundations of this. Some of its aspects was already discussed in the mainstream scientific literature, but here the aim is to observe those aspects which has not been revealed yet. Of course because of the length limits it is not possible to elaborate on each interesting or important factor, but the added value of this approach can be considered the bio-chemical and anthropological outlining of certain communication processes, and the approach of e-democracy tools from the point of views of social economy, value sociology, value system, motivation research.

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[2] http://cci.mit.edu/research_creating.html

1.2 Digitalization- Panacea for all diseases of democracy?

According to Virgile Deville,co-founder of DemocracyOS France and Open Source Politics:
„With Blockchain technology we are now able to create a global jurisdiction that works for all of us, in cyberspace."[3]

Are we sure that global jurisdiction that serves everyone on the planet can be realized in cyberspace? When we see examples of political processes organized and started in cyberspace, like the Arab Spring movements, it is becoming more and more clear and common sense that these were not initiated originally by local citizens, they just became the unconscious puppets of some greater global interests.

If we compare the economic indicators of the concerned countries before the Arab Spring has started and in current days we see a sharp decline in almost each cases. As Salem, Associate Professor of Public Administration at British University in Egypt (2016) pointed out also the Egyptian economy has been hit strongly by the consequent processes of Arab Spring.[4] „In the two years since the fall of Mubarak, prices of various items were up, and so was unemployment. And with the poverty rate rising from 20% to 25%, businesses felt the pinch."

(…) Foreign currency reserves had dropped from $36 billion to $26 billion since the revolution, according to the Egyptian Center for Economic Studies. (…) The 2011 revolution prompted a downward spiral of currency weakness, capital flight and crumbling state finances. Egypt's economy took a tremendous hit during the uprisings of the Arab Spring. Egypt's GDP growth rate fell from 7.2 percent in 2008 to a paltry 1.5 percent forecast for 2012, and as many as 40% of Egyptians were believed to be living below the poverty level."[5] Needless to mention about the Libyan case where the data shows even more obvious tendencies. Professor Benjamin R. Barber, internationally renowned political theorist, author of the book Jihad vs. McWorld, founder of Interdependence Movement predicted already in 2011 about the dynamics of events in North Africa that the newly created democracies by these partly online movements are really fragile and may will not be long-lasting. As he expressed it in an interview, if the newly shaped governments will not be able to fix or maintain economic stability it is a great chance that they will fail, and being replaced by fundamentalist, islamist regimes.(Szarvas, 2011)

These facts warns us to overestimate or exaggerate the real potential of the tools of online democracy. As we can see on these examples the result that these tools, technologies can achieve is at least questionnable and at the long run not sustainable, not to mention about its manipulative potential. Namely transparency used to be mentioned as a greatest potential concerning e-democratic tools, technologies in spite of this we can see exactly the contrary, transparency is much less present in the case of these systems. These carries great opportunities for misuses which the normal users can not follow because of the lack of IT expertise, so in fact the transparency is present to a much less extent than in the traditional realm of offline politics.

[3] http://news.d21.me/en/communities/how-to-optimalise-modern-democracies/
[4] Lecture on the National University of Public Service, Hungary, 18th of November, 2016
[5] http://www.globalsecurity.org/military/world/egypt/economy.htm

2. Limits of online political debates, discussions compared to offline communication based on the results of evolutionary psychology, genetics, neurobiology, bioinformatics

As Lednyiczky (2007) claims on the field of bioinformatics it can be observed that the functioning of certain cells in itself is an extremely difficult process already, not to mention about the subtle coordination of tissues, organs and the synchronization of metabolism processes. If we were to connect all computers in the world with some special software, neither in this case would we be able to direct one single living organism. As he explains the bioinformatics put the emphasis on the observation of the whole organism, not only the brain research, since each cell has its own consciousness. The cells have their own adaptive steps. The synchronization of these extremely complex processes means a highly complex system of communication between the cells, but not only with each other are they connected, but also with the whole living system of human beings and mammals due to the hippocampus of our nervous system. This functions as a special antenna which connects us with the fundamental vibration of Earth-ionosphere, atmospheric signs and with each other and the mammals, who's hippocampus brain region is tuned similarly to human beings. So our thoughts and emotions are synchronized or connected through our hippocampus.[6] It is also observed that this complex communication or synchronization process is blocked or hampered within certain circumstances like in the case of those who lives in thick wall concrete buildings or works underground and rarely go out into natural environment. They are lack of these natural regulatory signs, so they can be connected only partially or to a limited extent are they able to

[6] Rupert Sheldrake's theory about morphic resonance and morphic fields explains this phenomena further, and the existence of this connective-field gives an answer to the problem or phenomenon of space-independent coherence. He is an English biochemist born in 1942, initially dealing with plant development. In the course of his work he found results which led him to use and further develop the thoughts of French philosopher Henri Bergson. He applied these in the sphere of biology. As a result he found that 'for understanding the development of plants, their morphogenesis, genes and gene products are not enough. Morphogenesis also depends on organizing fields. The same arguments apply to the development of animals. Since the 1920s many developmental biologists have proposed that biological organization depends on fields, variously called biological fields, developmental fields, positional fields, or morphogenetic fields. All cells come from other cells, and all cells inherit fields of organization.' What he says is that there is a field which comprises certain patterns of development. Plants and animals develop according to these, which patterns can be found on a collective level of consciousness of these species, or as he called it on the level of morphogenetic fields. So through these fields all animals and plants are connected with each other, since their patterns of development come from a common resources. To put it more concretely: 'the hypothesis is that a particular form belonging to a certain group, which has already established its (collective) morphic field, will tune into that morphic field. The particular form will read the collective information through the process of morphic resonance, using it to guide its own development. This development of the particular form will then provide, again through morphic resonance, a feedback to the morphic field of that group, thus strengthening it with its own experience, resulting in new information being added (i.e. stored in the database). Sheldrake regards the morphic fields as a universal database for both organic (living) and abstract (mental) forms.' http://www.sheldrake.org/Articles&Papers /papers/morphic/morphic_intro.html In: Hajnalka Szarvas: The Emergence of Global Consciousness and Its Impact on the System of Global Governance. (Thesis) Corvinus University of Budapest, 2011, Budapest, p.5-6. http://wiki.p2pfoundation.net/Emergence_of_Global_ Consciousness_and_its_Impact_on_the_System_of_Global_ Governance_In the 1990's_Pjotr Gargyagyev Russian biophysicist and molecular biologist, Russian Academy of Sciences came basically to the same conclusion when researching DNA and human inheritance patterns with his research group in Moscow. They observed the „junk DNA" and its functions and found that this molecule has a highly complex language. The research group came to the conclusion that the fragments of double spiral which do not take part in protein synthesis, serves the functions of communication, more exactly the so called „hyper-coummunication". This means a certain type of data change on the level of DNA and genetics. Gargyagyev et al. analyzed the vibratory answers of DNA and found a functioning of an own intelligent network which makes possible the hyper-communication and information flow between all being able for sensing. This can explain the phenomenon of space independent coherence, or The Einstein–Podolsky–Rosen paradox. In: Kingsley L. Dennis: Új tudatosság egy új világért, 2012 Budapest, 139-153.

participate in this synchronization process which can lead to serious disfunctions of the nervous system, sensory and later on hormonal and other functional distunings and disharmonic states.(Lednyiczky, 2007)[7]

2.1 Nature given supercoherent global communication network

So what we see from the latest research results there exist a nature given supercoherent global communication channel between not only all human beings, but with all the living systems of the planet. The Club of Budapest's recent conference put the emphasis exactly on this supercoherent global network and supposed that if we were more tuned on these natural connective-fields our communities could function on a much higher level of being.[8]

When we use mobile phones, smart phones, laptops to communicate with each other, this natural communication channels, synchronization process which connects us with other human beings and the living systems of our Earth naturally, are weakened, distorted or shaded. It is just hardly revealed how electrosmog and the use of smart phones influences our above described natural „global communication networks, or channels" through the hippocampus. We do not know yet, how much of these informations we loose by using these tools instead of our „**nature given communication application**." Although more and more studies and researches exposes the destructive effects of digital tools, causing different type of mental and other illnesses, concentration deficit disorder (CDD), memory disorders, sleep disorders, social phobia, depression, anxiety, low self-esteem, etc., (Kanokpornl, Peerayuthl; 2016), (Chou, Edge; 2012), (Tayyaba, 2016), (Theocharis, Lowe; 2016)

2.2 Evolutionary limits of communication – Locality constraints of democracy (e-democracy)

When we talk about communication, and the different technological tools, opportunities of communication we find that even if the mobile technologies makes this possible to communicate on a global scale, if we look at most of the people's call list, for the most part we find close relationships, like friends, family members, relatives. And this is true for sms-es too, most of these are orientated towards geographically close or really close dots.

[7] Same article, p.221-222.

[8] http://www.clubofbudapest.org/clubofbudapest/index.php/en/ 3-4th of December 2016, http://www.clubofbudapest.org/clubofbudapest/index.php/en/international-news The Club of Budapest Impact Program: Toward 2020

2.2.1 Tribal connection- tribal way of keeping contact[9] - Global world-local connections

The range of the mobile phones are global, and still it serves mostly the communication within smaller communities and regions. Although we live in a global world, our connections still remained local- suggests the research results of the Communication in the 21th Century- New Experiences of Connection and Community Research (2010).[10] It is also not by chance that the different online communities uses the designation „tribe". But does it a legitimate denomination or title for them? Can we call these online communities a tribe? What are the criterias of this evolutionary way of organization? As Communication in the 21st Century (2010) shows this has another crucial factor or criteria **besides group size**.

2.3 The connectivity between the users – Inner coherence, structure of communities Importance of personal physical relationships in mobile communication

As the research highlighted the connection, communication via mobile phones, mobile technologies are only efficient if they are accompanied by previous personal encounters, so they can lean on these personal meetings, informations given on these personal occasions, and the connection can gain a confirmation through these personal physical meetings, presence. So the personal presence and connection still seems to be an indispensable part of communication, and so each kind of community. [11]

Therefore not all online communities can be described as a „tribe"-like organized in this sense. This explains a lot about the disfunctions and failure of those too large e-democracy projects of the European Union for example, where the users do not create a real community in this sense, there is a **lack of personal relationship between the members** and each kind of belonging and so the trust, the social capital in fact which lacks the most from these initiatives which would give the inner coherence of the groups. They are mostly built on misperceptions and wrong outdated mechanistic, bureaucratic theories of human relationships, just like this research results illustrates.

Mindell (2009) in his book Deep Democracy also emphasizes:

„The democratic methods, rules and laws in itself do not create a sense of community or community experience. The rules and laws can govern mechanic systems, but not people. (…) The organizations (communities) are just partly mechanic systems which needs to be changed. On the

[9] See more about genetically determined community size: Newman, Mark, Barabási, Albert-László, Watts, Duncan, J., *The Structure and Dynamics of Networks*. Princeton: Princeton University Press, 2006. ; Christakis, Nicolas, A., Fowler, James, H., *Connected. The Surprising Power of Our Social Networks and How They Shape Our Lives*. New York, Little-Brown, 2009 p. 174.; Takács K. 2010. Hálózati kísérletek. (Network Experiments) *Közgazdasági Szemle*, 57(November), 958-979. Takács K.; Janky B., and Flache, A. 2008. Collective Action and Network Change. *Social Networks*, 30(3): 177-189.; Janky, B. and Takács, K. 2005. Social Control, Network Structure, and Participation in Collective Action. In: *Társadalmi térben*. BMGE, Budapest. Tamás Freund, brain researcher, neurobiologist Director of the National Brain Research Program Hungary, prize winner researcher of the Brain Prize 2011 about higher viability of small communities: Freund suggests that in smaller communities, evolution favours patterns of behaviour that can be more cooperative, because of the capacity of our brain which is only able to follow the mutuality in smaller, transparent communities. In: Zoltán Kövecses: Creating metaphor in context, International Journal of Language and Culture, Volume 1, Issue 1, 2014, pages: 21 –41

[10] p. 29.

[11] Hungarian Youth Research (2014) also shows the same results. The common element of those organizations which were the most successful in terms of engagement were direct and strong personal connections within the group which gives a strong inner cohesion. In: Hajnalka Szarvas: Külhoni Magyar Ifjúsági Helyzetek In: Magyar identitás határon innen és túl, Új Ifjúsági Szemle online kiadvány, 2014 (szerk.) Székely Levente, p. 87-135.

other hand they are living organisms as well, and their live-giving bloodstream consists of emotions, thoughts, beliefs and dreams. If we do not take into consideration this bloodstream, namely the experiences arising in each moment, then we do not pay attention the emotions and oppress what I call the dream-level (background) of everyday life, in schools, businesses and in cities in general. Cancelling the dream-level of our life finally makes us depressed. When facts are becoming more important than emotions and dreams, then we start to get bored, we do not vote, we do not go to meetings (…) The indifferent or inert participants destroys the organizations, which are going to collapse as house of cards."[12]

Robin Dunbar, a British anthropologist and evolutionary psychologist with his social brain theory states in fact the same than the above mentioned Tamás Freund, brain researcher, neurobiologist. According to this there is correlation between the size of the neocortex of primates and certain features of their social behaviour including the size of their group. The size of the neocortex determines the group size, so the brain can not cope and follow informations exceeding this. According to the human beings neocortex we should have live in groups of 150.(Dunbar,1992)[13]

The correspondence between high degree of inner coherence of groups and transparency, control of power and authentification processes will be elaborated in the second part of the study related with blockchain technology which is built basically on the same principles.

3. The Impact of online political communication – political communication in social media on public discourse and political participation

If we interpret communication as some kind of participation then a very important decision is, whether I participate in the nature given communication flow and connection with other human beings and all living systems that way being able to resonate all of their needs and sustaining longterm harmony or I choose to be present in the different virtual groups, online realities with weightless and responsibility-free clicking activism as a citizen? Of course that is maybe a too sharp approach of the question, and these are not absolutely exclusive categories.

According to Aczél (2014)[14] one of the characteristics of Z generation is the almost exaggerated hunger for attention, which can even reach the level of narcissism, as it is called now „attention economy" where the most wanted currency or goods is the attention.

So a basic difference between the previous content provider services is that while earlier these used to be a professional, paid jobs, now in the network media logic content providing is free produced by the users and almost the only and most important aspect of it is the maximalization of attention. (Merkovity)

It is also important to note that the use of social media does not provide in fact greater freedom or space for political debates. In spite of the seemingly lack of control, this works as a directed force field. As Imre and Owen (2014) formulated before the users of technology could start the radical change of politics, the technology itself ensures that the individuals become part of the already existing framework of power relationships, status quo.

[12] p. 23.
[13]Communication in the 21th Century – New Experiences of Connection and Community 2010 Kristóf Nyíri, Mobile World Research, Magyar Telekom Nyrt. p.81.
[14] 2014. szeptember 26. Kutatók Éjszakája (Night of the Researchers), Corvinus University of Budapest

A recent research Bene (2017) also shows that the social media is dominated by the political communication of a narrow minority. It also proved that most of the higher education students only consumes the political news, the proportion of content producers is less than 30%.

4. Information technology (IT) in human to community communication and e-governance

4.1 What is community and communication?

In the main stream liberal journalism the word community is simply used for a collection of people regardless any internal cohesion in the group or mass. In a sociological sense the liberal definition is for a mass or undefined group of people.

In contrast, we are using the word community for a group of people living together, having common basis of life, work, culture, religion and having many strong cohesion forces inside, like families, relatives, friends, teams, business partnerships and so on. A community may be a small village if they rely on themselves in most of their life, and have strong internal relations.

And we use the word communication as an activity that makes them a community. Communication may use some means for that like speech, meta-communication, common activities, common pray, good will, self-abnegation, sacrifice for the existence of a community, a friendship, a family, a team and so on. Every single action holds a message towards the members that you want your community to live. Also the community involves the members in its life, it makes the member believe that he or she is needed, necessary for the community, and has an authenticated mission in the community. Communication not just makes people cooperate, but it creates community. (Vass, 2005), (Pentland, 2012)

4.2 What motivates a member of a community to get involved in a community work?

Motivation is in close relationship with needs, necessities and pressure on one hand, success, pleasure, reward, attention on the other. If these factors (and more) are present in the game then faith, trust, loyalty etc. may emerge, and people will be more inspired to cooperate.

The relationship between a community and a member is very similar to that of a marriage, a friendship, a business partnership or a soccer team. On one hand, there are strict requirements from each other, on the other hand, the members will be proud on their membership, the common success will be their personal success, too. We may talk about common success economy (Vass, 2005b), where investment is every act for the community, and the return is the common and personal success and pride. The situation is the same if we consider attention (Attention Economy, Beck, 2002). Of course, a successful community is dedicated for material profits, too.

Another aspect must be noted. This is personal ambitions that may be moderate or immoderate, may admit the primacy of the community or may grind his/her own axe. Such an eagerness may also lead to certain forms of cooperation. Every community needs to control (help and limit) these personal ambitions.

4.3 What motivates a human to communicate via IT means?

This question is complex and cannot be answered in a short paragraph. We need to consider it as a economical issue. If using an IT tool is more pleasure or less effort or has more return than organizing a workshop then people will use it. Commercial "social media" applications combine factors that make them more widely used. Everybody is curious of their friends, they are also receiving many "likes" no matter what they post, also enjoy interesting posts, ads and ideas. Many sources of pleasure in one web application.

Also the users do not need to travel or pay to talk with their friends. A very little effort needs to be made to receive all these pleasures. However, all their opinions are widely shared, read, praised with dozens of "likes" and also argued, which is a very intensive form of attention regardless if criticised or supported.

People also use IT means when the return is more than not using them. Computation, data handling (fast search in big sets), security and many other uses make IT means worth it.

When the question emerges about e-gov (electronic governance or government) applications, we need to consider both the motivations for cooperating in a community and motivations to use IT means of cooperation. Both of them can be considered as non-material economic issues. So we can answer the following question, too: "Why people do not use our e-gov application?" Possibly, it simply does not worth it. Effort, bad feedbacks, lack of social return, lack of potential, lack of pleasures, lack of attention makes these initiatives fail. Also, in a small village, a regular meeting gives more and needs less effort than using an IT tool.

Designers of such tools should also consider the most widely used applications, too. If the logic of using your tool is very special (e.g. because an official procedure is mapped on it) then a village member who is used to Facebook will not learn it. It is simply too much effort. Or if there is no feedback on their vote or idea then they will not use it because they feel no attention to them.

An e-gov application designer also needs to consider that the giant "social media" applications are disinterested in rebuilding communities. Increasing number of studies and researches has revealed how social media changes the social behaviour of individuals, causing different type of disorders, mental illnesses, depression, etc, which makes it difficult for the users to socialize in their natural communities. Several research findings pointed out the negative consequences of the excessive use of social media for real community functioning and participation. (Hormes, 2016)[15]

These "social" media tools also operate as information pumps. They suck information of every people and sell them to commercial markets for business intelligence inputs. On the other side, they receive ideologies, advertisements and other (mis)leading information from their business customers (corporations, secret agencies and political parties) and pump them to the wide public. So

[15] As Hormes (2016) exposes “Excessive use of social networking sites (SNS) has recently been conceptualized as a behavioral addiction (i.e., “disordered SNS use”) using key criteria for the diagnosis of substance dependence and shown to be associated with a variety of impairments in psychosocial functioning.” Her research has proven the correlation, as she summarizes the results: „Respondents meeting previously established criteria for “disordered SNS use” were significantly more likely to use alcohol to cope with negative affect and to conform to perceived social norms, reported significantly more conflicting (i.e., simultaneous positive and negative) attitudes towards alcohol, and had experienced significantly more, and more frequent adverse consequences from drinking in their inter- and intrapersonal, physical, and social functioning, compared to individuals without problems related to SNS use.”

the e-gov application designer must compete with these giants and continuously make the worthiness of their tool over that of the competitors.

4.4 What are the differences and similarities between human talk and IT communication means?

Internet-based IT communication cannot substitute human speech but it gives numerous extra features and limitations compared to human speech:

- very wide accessibility: all over the world with extreme reach ratio (except for the poorest),
- frequency of replies, immediacy (answers come almost immediately, no need to post a letter, prepare a TV program or newspaper etc.),
- ease of use for single person without much effort to travel or organize travels,
- no professional control: little censorship; but likelihood of hoax-es, misleading or fake news
- permanence plus editability: ease of group editing a saved document or add reply to posts in social media
- privacy or publicity: optional if a private and strong-encrypted conversation is needed; or a high publicity blog
- a completely different meta-communication: IT uses analytics to discover internal and statistic correlations
- no common mind, only information exchange. People are often much more creative in a real workshop than in a virtual meeting

4.5 Exposure to manipulation by power centres

In the western democracies, manipulation is a built in element in the election systems. Both the electors and the results are subject to a heavy manipulation activity. Possibly, only very serious differences between parties are not worth manipulate.

One can say that the more IT the more manipulation can be hidden from the public. However the more IT the more data is stored hence more evidence can be collected.

In real, manipulation is a matter of public control not technology. In the case of a small, local community with its many internal coherences, the control can be more direct and fast. (Note: Localities where communities have atomized to a mass of rivals have faced with crime and juvenile delinquency which was not present before to such an extent due to control of community presence. (Bellair,1997) In the natural world we can see parallels. Lack of cooperation and increased stress and rivalry happens with trees that live far away from their large backwoods) (Wohlleben,2015)

So the best location for an e-gov system may be the locality or a community. A hierarchical structure of e-gov systems may be public controllable, too, if all logic and indicators are open and reproducible, and the hierarchy is a spatial structure, based on little localities where possibly

everyone knows everyone *(village, sub-district, <150 cooperating people according to Dunbar* (Dunbar,1992) – *that can organize 3-10 times more)*. This size can produce a good source of public data because of the good public control. Then higher (county, country) levels can be built, and their results can be double-checked against the public local data.

The best system of manipulation by the power centres is where every power branch is ruled by the power centres. Even elections are just the means of legitimation of the central power who practice their power through their parties. Contrary, the best public-controlled structure is a very strong locality who delegate their best members to a higher level local council, who also delegates their best to the parliament. This would be the least exposed to manipulation due to the strongest public control at each level. In some countries, such a hierarchy ends in a parliament house. The power centres put their parties into one house, the delegates of the nation sit in another house.

IT administration of political attitudes should also be based on small localities and organized hierarchically, and controlled at each level. The other key issue on IT systems is the publicity of all the logical rules and indicators so that every logic operations and analytic results to be reproducible.

4.6 What extra information may help local and central government when utilizing IT means?

IT communication is a pre-compiled form of communication. The questions and questionnaires must be well-designed, but they are very heavily subject to manipulation. However, the analysis of answers can discover much more than the answers are about. If one answers many questions then there are statistical contexts, internal relationships that say much more than the answer. You can make groups (clusters) of people along these patterns. Also, every single attitude of a person says much about that person. That is why social media systems are considered as gold-mines where the users' attitudes and opinions are the product. Billions of them make a very high-resolution market picture, from which new markets, possible threats and potentials, political and economical market gaps and trends can be uncovered. Every search is an attitude, too. This kind of analytical data sources are named data mines, and sold to corporations, political parties, secret agencies. Not the central power centres but the public groups become transparent. However, analytic tools (Kimball, Ross,2002) and data mines (Zaki, Meira, 2014) can be utilized by governments, too. And not only political preferences but yes, political will can be discovered. If a government knew what the people prefer they could better rank their strategies and programs. Also they knew what to give to the country what to the city and what to any groups of people. A better civil service, a better polity, better laws and better distribution could be achieved. This is only a matter of political will.

4.7 What are the basic IT means of community communication and information processing and sharing the results?

Wikies, discussion boards	Real topics, plans can be defined and discussed
Public journals, blogs, forums	Local public journalism, which really differs from power journalism
Voting sheets, questionnaires, surveys, polling	Primary data acquisition means.
Publicly edited documents	Means of cooperation in administration and planning

Chat, voice conference, video conference	Live speech. (permanent or not, private or public)
Community open budget	Every member vote with a part of their tax on local projects.
Project planning and organizing	Local projects planned by professionals, executed by local companies, monitored publicly
Local market and small ads system	You must give a good place to community members to sell and buy new and used goods
Integrated local administration	All public, official and monetary tasks administered here, publicated automatically, according to open rules
Analytic (intelligence) system	Statistical and OLAP analysis to discover groups of attitudes, correlations, common will. It can analyse all the data from all the above systems.

4.7.1 Future technologies

In this paragraph, only Blockchain is mentioned as an example. It is a good example for an IT structure that is an electronic implementation of a community feature. In ancient and traditional communities, every sacral events (e.g. the celebration of the Eucharist and the sacraments, christening, wedding, burial) have been evidenced by a large number of witnesses (e.g. a whole village). Also many of them have received remembrance or souvenir, too, that helped memorize the event. Also documents have been created that recorded the exact activities. The trust vital to run a monetary system is also based on numerous witnesses who can sell and by using that money. This evidencing feature of many witnesses is the essence of this distributed future IT technology. It offers a very high trustworthiness, reliableness and speed due to the built-in numerous miner ("witness") nodes. If one node or transaction is manipulated then hundreds will cry thief.

This technology is currently used for distributed authentication, authenticated document database (contracts, warrants, ID cards etc.) and electronic monetary substitute (Bitcoin, scriptural money). The latter usage is currently unregulated thus used to create hundreds of stock exchange balloons, but in the future, it will be also used as electronic book for community markets.

5. Conclusion

As a concluding remark we can state that, observing the Arab Spring and other partly or fully online organized protest movements and their outcome at the longrun, they will not be able to fix the deficiencies of "offline" or traditional politics. The realm of online politics or cyber-participation do not give an answer for the lack of transparency of traditional political decision-making, more over the lack of transparency and the potential of manipulations can be discovered to a much greater extent in e-democracy softwares and processes for an average citizen because of the lack of expertise. When the power logic behind is the same then digitalization of the process will not change anything at all. As Mánnel (2016) put it "We digitalize the wrong process the same way."[16]

[16] ceeeGov|Days2016: Central and Eastern European e|Dem and e|Gov Days 2016, Budapest, May 12-13, 2016

Furthermore the research results of bioinformatics and evolutionary psychology also proves that the communication between the living systems and human beings is a much more complex and multi-level process of synchronization or attunement, co-ordination, than we would ever thought and this serves with an enormous information plus which is highly limited if not lost absolutely when this takes place in the cyberspace. The results of evolutionary psychology also explains why too large communities do not really function which can be an explanation of the failure of EU-large e-democracy initiatives. The trust of human beings is always bound to a certain locality. Researches about mobile and cyber-communication ways also revealed that these are only successful if they are associated with regular physical presence, meetings too. Kaldor, one of the most well-known researcher of global civil society movements also suggests that psysical presence still has the decisive power when it is about bringing real political changes and overcoming fears at collective levels.

What can make e-democracy tools, DMSs (Decision Making Softwares) more successful is paying greater attention to motivation and value-system researches, and developing the tools, mobilizing people according to their main goals, what really makes citizens move at the local level. The study also suggests that although blockchain technology in itself will not solve everything, still the logic behind its functioning is very much corresponding with ancient community regulations or rules, therefore it is a promising direction, just like data mines utilized by goverments could serve public interests.

There are of course countless other important questions which may arise concerning these issues, which could be a topic of another study in the future.

6. References

[1] BELLAIR, P. E.: Social Interaction and Community Crime: Examining - The Importance of Neighbor Networks Criminology Vol (35), Issue 4, 1997, p. 677–704.

[2] BENE, M.: Egymásra hangolva. A Facebook információforrássá válásának hatása az egyetemista fiatalok politikai viselkedésére In: Racionálisan Lázadó Hallgatók III. , Belvedere Meridionale, 2017, p. 13.

[3] CHOU, H.-T. G. and EDGE, N.: They Are Happier and Having Better Lives than I Am'': The Impact of Using Facebook on Perceptions of Others' Lives, Cyberpsychology, Behavior, And Social Networking, Vol 15, Number 2, 2012, p. 117-122.

[4] Communication in the 21th Century – New Experiences of Connection and Community 2010 NYÍRI, K., Mobile World Research, Magyar Telekom Nyrt.

[5] DAVENPORT, T. and BECK, J.C.: The Attention Economy – Understanding The New Currency Of Business, 2002.

[6] DUNBAR, R. I. M.: Neocortex size as a constraint on group size in primates, Journal of Human Evolution, 1992.

[7] KIMBALL, R. and ROSS, M.: The Data Warehouse Toolkit – John Wiley and Sons, Inc, 2002.

[8] HORMES, J. M.: Under the influence of Facebook? Excess use of social networking sites and drinking motives, consequences, and attitudes in college students, Journal of Behavioral Addictions Vol (5), Issue 1 , p. 122-129.

[9] IMRE, R., OWEN, S.: A közösségi média és az alanyiság: A kormányzás információtechnológiai birodalma 243-263. http://mek.oszk.hu/14700/14786/14786.pdf

[10] KANOKPORN, S., PEERAYUTH, C.: Face it, don't Facebook it: Impacts of Social Media Addiction on Mindfulness, Coping Strategies and the Consequence on Emotional Exhaustion. Stress & Health: Journal of the International Society for the Investigation of Stress. Oct2016, Vol. 32 Issue 4, p. 427-434. 8p.

[11] LEDNYICZKY, G.: Elménk birodalma: tudat, módosult tudat In: Világokon át- barangolás a metafizika birodalmában, Pilis-Print Kiadó, 2007, p. 220.

[12] MERKOVITY, N.: A politikusok médialogikája a közösségi oldalakon: Facebook és Twitter kutatás p. 169 (p.165-192.) http://mek.oszk.hu/14700/14786/14786.pdf

[13] MINDELL, A.: Deep Democracy: Nyitott fórumok-Demokrácia minden szinten, Nyíregyháza: Pilis Print Kiadó, 2009.

[14] PENTLAND, A. S.: Leading Teams (multiple short articles); 2012, Harward Business Review https://hbr.org/2012/04/the-new-science-of-building-great-teams

[15] SZARVAS, H.: The Emergence of Global Consciousness and Its Impact on the System of Global Governance. (Thesis) Corvinus University of Budapest, 2011, Budapest, p. 28. http://wiki.p2pfoundation.net/Emergence_of_Global_Consciousness_and_its_Impact_on_the_System_of_Global_Governance

[16] TAYYABA, A.: Too much Face and not enough Books! Impact of Facebook Addiction on Academic performance. Annals of Abbasi Shaheed Hospital & Karachi Medical & Dental College. Sep2016, Vol. 21, Issue 3, p.193-194. 2p.

[17] THEOCHARIS, Y., LOWE, W.: Does Facebook increase political participation? Evidence from a field experiment. Information, Communication & Society; Oct2016, Vol. 19 Issue 10, p. 1465-1486, 22p.

[17] VASS, Cs.: Hatalom, Szakralitás, Kommunikáció -- Kölcsey Int., 2005.

[18] VASS, Cs.: Bevezető Fejezetek A Társadalom-Gazdaságtanba -- Kölcsey Int., 2005.

[19] WOHLLEBEN, P.: Das geheime Leben der Baume; 2015, Ludwig Verlag

[20] ZAKI, M. J., MEIRA, W. Jr.: Data Mining and Analysis: Fundamental Concepts and Algorithms; Cambridge University Press, May 2014.

CLUSTERING OF TEXTUAL INPUTS IN LARGE EPARTICIPATION PROJECTS

Alexander Prosser[1] and Cyril Velikanov[2]

Abstract
eParticipation projects often comprise deliberation among participants, where proposals are collected, discussed and rated to be processed in further stages of the eParticipation. In the case of large-scale audiences, this initial stage involves mass-online deliberation (MOD), which has to cope with a potentially very large number of proposals advanced by the participants. To enable clustering, MOD rely on human- (i.e. participant)-based appraisals of proposals given in the course of the participation project. Based on these appraisals, this contribution then proposes a clustering algorithm that makes use of the whole set of the above individual ratings. (Dis-)approval ratings are first weighted by the indication of clarity, that is, the higher the clarity rating assigned by a person, the higher the weight with which the (dis)approval rating will enter the clustering.

1. Introduction

1.1 The Issue

Present day ICT enables better inclusion of citizens in public decision making. It is the ubiquity and 24/7 availability of the digital media that greatly enhances and promotes citizen participation, by facilitating their participation from abroad, or by accommodating working people who do not have time during the day, or by simply attracting the younger generation that is used to the digital media. However, many eParticipation projects have suffered from low participation (see the reviews in [1] and [2]), which, of course, undermines the political validity of the results of the participation process and induces political representatives to ignore the results thereof, which in turn invariably leads to disenfranchisement among the (potential or real) participants thereby creating a vicious circle.

If the authors of this contribution refer to large-scale or mass (online) deliberation, the notion does not refer to schemes selecting a sample of participants out of the entire population and holding a deliberative process with them, with the most notable example being the process proposed by J. Fishkin ("deliberative polling" [3], [4]). In another publication, the authors have already extensively argued why such approaches from a purely practical purpose do not lead to optimal inclusion of people and furthermore, why they are also problematic from a socio-philosophical point of view [5]. If, in the following, the authors therefore speak of mass online deliberation (MOD), they refer to schemes where all members of the relevant population have the opportunity to directly participate in the process.

Only a few digital participation projects in Europe can be called "mass" online deliberation projects, most notably the deliberation on the new Police Law in Russia [6], the newly-drafted Icelandic constitution [7], [8], the amendment to the Estonian constitution [9] and some proposed

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legislation in Finland on off-road driving [10]. An extended analysis of these participation projects can be found in [5]; briefly summarizing, their common denominator was

- A large number of participants with thousands/tens of thousands of participants and contributions;
- They were all triggered and (largely) run by some branch of government; apart from Russia the countries were small to medium-sized;
- They were heavily advertised and received extensive media coverage;
- They had difficulties coping with the large number of contributions, which were largely overlapping and were the discussion diffused into different strands with a large amount of duplication; in some cases huge manual resources were mobilised to structure these strands, which is, of course, not a generally applicable solution – even for processes run by or with the government;
- Results of the deliberation process were either not implemented or diluted in implementation creating some disenfranchisement.

In all these cases, it became clear that conventional deliberation methods cannot cope with large-scale deliberation (arguably the rationale for Fishkin's selective approach). Therefore a new general model of deliberation has to be found, that allows fair and inclusive, yet structured and goal-oriented deliberation in very large groups; the authors have proposed such a general model in [11], which will be presented in the following section. However, the general model still needs refinement in terms of a "technical blueprint", where one aspect – that of clustering proposals – will be dealt with in this contribution.

1.2 The General Model

Considering the above examples, the following phases can be distinguished in virtually all these projects [11]:

- There were some preparatory actions, appointing experts, creating in some instances the legal framework etc. (Phase 0); this also involves the registration process, where either pre-existing logins are used or participants are registered in some other way;
- The *ideation* phase, that is collection of proposals and their commenting by participants who also grade or rank the proposals (Phase 1); in this phase, contributions are grouped into thematic clusters, which happens as an ongoing background job of the system;
- The *consolidation* phase (Phase 2), where the proposals in a cluster are consolidated into a single lead proposal by a team of editors; there are several ways of choosing the members of the consolidation team, one would be to invite the originators of the best-ranked proposal in the thematic cluster;
- The *editing* phase (Phase 3), where clusters are merged to produce a smaller number of competing lead proposals; this phase is supported by the system, nevertheless the main work is done by a team of editors merging the lead proposals of one or several similar clusters;

mechanics must be found to (i) select the editing team and (ii) to provide a decision process for the merger outcome and also to allow for dissenting opinions;

- The selection of one of these competing lead proposals either by the participants themselves or by an external body, for instance a national parliament (Phase 4).

This paper deals with the mechanics of the clustering phase based on a set of ranked proposals that are the outcome of Phase 1.

1.3 Why Not Facebook?

A very popular question in this context is the usage of readily available social media with Facebook being only a *pars pro toto* in this regard. There are several reasons, why we would be extremely sceptical about their usage:

- These media are typically under the jurisdiction of the U.S., where legislation on some key points (hate speech, erasure of statements qualified as hate comments[3], data protection[4]) may differ markedly from European standards;

- In the past, Facebook has shown a rather arbitrary policy of shutting down pages for no apparent reason: The disappearance of the page of the City of Munich [16] and H.C. Strache (an Austrian politician, see [17]) may serve as examples.

- Probably the most important issue is the linear character of those media, which in our view does not lend itself to complex deliberation. For instance, the assessment and clustering mechanism which we consider instrumental in achieving a well-designed MOD can hardly be imagined within the framework of the general social media.

2. Assessment of Proposals

2.1 General Aims

The clustering is based on the proposals made in Phase 1, where every participant has the opportunity to (i) make proposals, (ii) to comment on them and (iii) to rank them. The general mechanics that can be observed in fora virtually everywhere, however, has some serious shortcomings:[5]

[3] An extreme example would be The National Socialist Party of America vs. Skokie (Il) [12], [13] where a public rally by an openly racist and anti-Semitic organisation was permitted by the Supreme Court on the grounds of the First Amendment. In this regard, plans announced by European politicians (for an example see [14]) to "punish Facebook with fines of up to 50 million Euros per case" if they do not erase comments fast enough, which (by European standards) are objectionable, appear completely unrealistic: Facebook & Co. are subject to U.S. Law – and nothing else. A European subsidiary that may handle advertising clients from Europe can be shut down fast and the clients handled from the U.S. via the Internet.

[4] This does not only refer to looser standards for the commercialisation of data, but also some legal obligation to provide data on request of the authorities. [15]

[5] In the following, we will only consider proposals and comments/grades pertaining to proposals. The structure of such a deliberation system could, of course, be a lot more complex with counter and spin-off proposals emanating from discussing an initial proposal, facts amended to proposals etc. In such cases, there would be a full-fledged Issue-Based Information System (IBIS), cf. [19]; this would however not change the fundamental argumentation in the following sections.

- It enables "claques" or mobbing in that organised or ad hoc groups systematically favour or denigrate proposals;

- Minority voices will therefore not get an adequate chance;

- Astroturfing [18] will get a chance for the same reasons;

- Late comers will not have the same chances as early proposals, as the latter would have already received a lot of attention and favourable (claque?) votes; any ranking based on such votes will create a systematic bias against these later comers;

- Commentators and those who rank the proposal will probably be influenced by the comments and grades already given and will be likely to "join the bandwagon".

- The whole process will therefore not yield the best goal.

This may lead to a biased, limited discussion that is distorted by claques and possibly astroturfed and that supresses minority voices. The authors therefore propose a review process on proposals, where the reviewers (participants) are invited to review the proposal; all reviews (and possible comments) are only shown after the reviews have been collected. [11] This ensures an unbiased review and rules out actions by claques or other organised groups. The exact selection process for the reviewers can differ and would have to be tested in pilot applications; possibilities include:

- A completely randomised selection;

- Weighted randomisation with the weights constructed according to "points", which are awarded for cooperative and responsible behaviour, such as doing one's reviews, not making comments marked as offensive, etc.;

- Some other algorithm linking reviewers to the area and nature of the proposal; however, we maintain that even then a random element should stay with the reviewer selection.

The aim is to minimise the usage of administrative staff and moderators and to provide a high degree of self-organisation in the process. However, this proposed general review process must be "economic" (for the reviewers) and easy-to-handle in order to get the necessary number of (invited) proposals. The following section suggests a scheme to achieve these aims.

2.2 Graphical Ranking Mechanics

The main idea is to structure the act of ranking into three stages: Clarity – Agreement – Assessment. In the following, consider Figure 1, which proposes a software-based "virtual joystick" to be used for quick, easy and yet rich assessment that produces parameters that can be used in the clustering of proposals as presented in Section 3.[6]

The fundamental question is certainly, whether the proposal to be ranked was understood. This is achieved in the left-most state depicted in Figure 1. The example shows a high degree of understanding. This indication is the starting point for indicating agreement with the proposal.

[6] For an earlier version, see [22].

Agreement has to be weighted by the degree of understanding, which appears to be intuitively obvious (eg, full agreement with a proposal one does not understand is worthless). Therefore, in the second step in Figure 1, the agreement triangle opens depending on the indicated degree to which one understood the proposal. Higher understanding thereby confers a higher opportunity to rate the proposal. Indication can then be given along a horizontal axis, whereby the user interface guides the user in his/her inputs. In the example, a rather high degree of agreement is indicated.

There remains yet a third element of rating – the quality assessment. Let us consider the rationale for this third element using an example: One may understand what is meant in a proposal, one may agree to it – and yet find it poorly worded. Hence, all three elements have to be included. Nevertheless, there are some issues to be solved:

- Subjectivity in assessment: Somebody used to high-level literary language may grade down a factually written proposal that to most of the audience would seem well-worded; hence, the benchmark for "well worded" is a moving one from reviewer to reviewer;

- It works the same the other way round: The contribution of a certain Mr. Wittgenstein may seem odd to somebody who gets his/her world-view from the yellow press;

Who gets to the third stage depending on the grading of clarity and agreement? This may concern two aspects:

- Does assessment of a proposal require a minimum degree of understanding? We would subscribe to that notion, as *any* further analysis requires a basic understanding of the proposal;

- Are reviewers who disagree (strongly) with the proposal allowed to quality-rate it? We would object to that as two issues can be predicted in this regard: (i) proposals one does not agree with would probably be systematically downgraded in an assessment by many reviewers, and (ii) the process becomes vulnerable to some "nasty" strategies, such as giving high quality marks for poorly worded proposals one does not agree with and vice versa thereby corrupting the "opponents'" argumentation base.

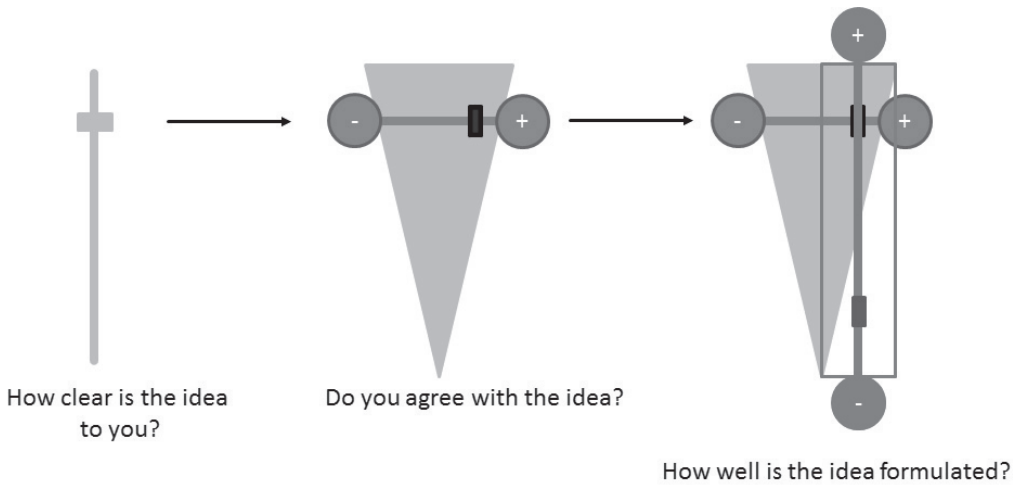

Figure 1: Assessment "joystick"

The mechanism proposed herein is subject to pilot implementations, which will provide a better understanding of the mechanism proposed on Figure 1 and its acceptance by real-world participants in a deliberation project. Therefore, the mechanism proposed can be seen as a falsifiable hypothesis that should be tested in a pilot implementation.

2.3 Implementation Considerations

Implementation-wise, this functionality could be realised in several ways, such as a Java Applet, Flash or HTML5 (of course in conjunction with java script). The most flexibility would probably be a Java Applet, which offers rich graphics and data handling behind the graphics; but this requires the download and installation of Java on the respective PC and may also create issues on mobile platforms. HTML5/java script would probably be the most general solution.

In any case, accessibility is an additional issue that needs to be addressed. Apart from the fairness and inclusion issues, public – and even private web sites in some countries – are by now required to offer accessible services. [20, 21] A possible solution would be to verbally request the ranking from the user in numeric form, incorporated in a dialogue that could run like the following:

"How would you rate the clarity of the proposal on a scale from 0 to 10 with 10 being the maximum clarity?"
Response: 7
"How would you indicate your agreement on a scale between -7 and +7 where minus values indicate disagreement?"
Response: -4
"Thank you for grading this proposal".[7]

2.4 Outcome

The outcome of this process is a data set linked both to the reviewer's account in the deliberation system and to the proposal, and containing a data triplet of (i) clarity grade C, (ii) degree of agreement (A) and (iii) quality grade (Q), providing the values for C and A exceed a certain threshold value. Once a sufficient number of grades has been collected, the general comment function is released by the system.[8] This is an important feature: The invited/appointed reviewers should do their work uninfluenced from either the ideas of the other reviewers as well as the general opinion (or the claque that professes to be "general opinion").

This data triplet is now fed into the clustering algorithm that runs as a constant background activity during Phase 1.

[7] There is no quality assessment as the agreement rate is negative.
[8] Provisions have to be made if there is not a sufficient number of reviews, reviewers do not respond, etc. Also, this must be fine-tuned and tested in a pilot system.

3. Clustering

3.1 Rationale for Clustering

In an MOD process, thousands and maybe even tens of thousands of proposals will be submitted. It stands to reason that a participant cannot read all of them, and that many – indeed most – of the proposals will be simply a duplication of others, where one and the same idea will be proposed over and over again. Therefore deliberating community needs to be provided with a "bird's eye view" on the whole spectrum of proposals already submitted, where proposals are grouped and categorised for better reading and understanding.

This is done in the clustering process, which identifies highly similar or identical proposals, and groups them into a cluster. One of the proposals in a cluster is to become the lead proposal in the cluster, to some extent representing its common idea. In Phase 3 of the entire MOD model (see Section 1.2) these clusters, which may be numerous, are consolidated into a small number of distinctly different clusters. The clustering method should rely on the ranking method presented in the last section; user interaction that consists in providing explicit pair-wise comparisons of proposals is possible, but should be kept to a minimum. Such requests would run along the same principles as the reviews – that is, on invitation only and by randomly selected participants (or participants selected by some algorithm which includes an element of randomness).

Clustering should be performed on a virtually constant basis providing a continuous update of the clusters as additional proposals and rankings thereof are submitted. Technically, clustering should therefore be implemented as a background job or at least a scheduled job running overnight.

3.2 Method – Initial Clustering

Consider Figure 2. There are two proposals, X and Y; and three users (reviewers) A – C, who rank these proposals. Depending on their rating of their understanding of the proposals, they were able to rank their agreement to the proposals in a more or less pronounced way (cf. the discussion around Figure 1). A indicates very similar rankings for X and Y, the absolute difference being only $D_A^{X-Y} = |7 - 6| = 1$. C on the other hand dislikes both proposals, $D_c^{X-Y} = |-8 - (-5)| = 3$. The fact that A likes and C dislikes the proposal is of no import at this stage. What counts is the difference between each reviewer's rating. B has a different view. B supports Y, but not X, that is $D_B^{X-Y} = |5 - (-2)|$=7. On average the difference in agreement ranking is 3.67 or generally $D_i^{X-Y} = \frac{\sum|X_i - Y_i|}{n(i)}$ with X_i being the rating of proposal X by reviewer i.

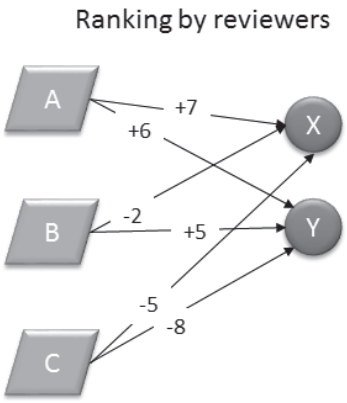

Figure 2: Distance measures in clustering

There are two issues with this initial measure:

- While a proximity in agreement most likely signifies proximity in ideas, the same cannot be said about disagreement, one may, for instance, agree with a moderate idea to solve an issue and equally disagree with both extreme ways to address the issue. Hence, negative agreement ratings of both ideas should be dropped from the calculation of the average.

- Mixed positive/negative rankings such as that of B yield a high "spread" and tend to push the proposal in different clusters. However, we can learn something from that:

    - If several reviewers rank like B and at the same time other reviewers rank the other way round, we may infer that X and Y almost certainly belong to different clusters;

    - If at the same time there are reviewers who both support X and Y, we may infer that these proposals follow the same general line but differ in some aspects, probably one being more radical than the other.

In the last case, the issue is that a large number of reviewers supporting both proposals (like A) may outnumber the mixed reviewers (like B) and hence the proposals would be placed in the same initial cluster, where they most likely do not belong.[9] A way out of this bind may be to give mixed reviews like that of B a different weight from uniformly positive reviews like that of A.

A special case will be proposal pairs X, Y, where there are a lot of reviewers rating both proposals in a positive way <+X, +Y>, some reviewers rating <+X, -Y> but no mixed rating the other way round <-X, +Y>. In such cases, Y may be seen as a special case or further evolution of X, which some reviewers do not subscribe to. These two proposals should therefore be put into different initial clusters.

[9] They may however be merged in Phase 3 to form a consolidated cluster but this is a distinctly different process.

3.3 Method – Manual Clustering

In some cases, this method may not yield a reliable, unambiguous result. Reasons may be small numbers of available ratings per proposal, or ambiguous ratings. Such proposals can easily be detected automatically; here a manual cluster assignment is indicated. A participant, either from a group of key users or randomly selected altogether, is invited to manually assign the proposal to a cluster. Because requiring much more efforts from the selected participants, this manual interaction should however be limited in number of interventions, the clustering should mainly rely on the automatism outlined in Section 3.2.

3.4 Pre-Selection for the Lead Proposal

The lead proposal within a cluster will be determined in Phase 2, however, a preliminary ranking can also be achieved in Phase 1 by ranking the proposals in a cluster according to the (average) quality grades. Allowance must be made for the number of rankings, so that a proposal that only received very few (but high) quality rankings does not supersede a widely-ranked but not so highly placed proposal. Solutions could be a threshold for the number of rankings the proposal must have to become the lead proposal of the cluster or a weight by which widely-ranked proposals are given priority.

4. Advantages and Further Research

The method presented herein gives voice to minorities, whose opinions are not supported by many. These opinions will remain visible in a form of distinct clusters, where such clusters will have fewer participants and probably also fewer ratings, nevertheless "survive" the initial Phase 1. It also avoids "claque" effects by inviting reviews and by not basing the chances of survivability of an idea on the number of comments or "likes" or similar things.

Another advantage is the highly automated clustering process and the fact that manual interaction in this regard can be done by participants who are randomly selected. This avoids a "committee of moderators", who would effectively be in charge of the clustering process and thereby exercise a degree of control that may seem inappropriate to a large portion of the participants, who may prefer a self-organising community to a hierarchy of moderators.

"The proof of the pudding is in the eating". This also applies to methods of social interaction via digital systems. The exact algorithmic implementation and the fine-tuning of the parameters used is a crucial and necessary empirical validation of the method proposed in this paper. The next step therefore can only be a pilot implementation of the whole system proposed by the authors including the ranking and clustering process proposed in this contribution.

5. References

All web quotes checked per March 25, 2017.

[1] KOUSSOURIS, S., CHARALABIDIS, Y. and ASKOUNIS, D., A Review of the European Union, eParticipation action pilot projects in: PROSSER, A. (ed.), Transforming Government: People, Process and Policy – Special Issue on Electronic Citizen Participation – state of the art, Vol. 5(1), 2011.

[2] EISEL, S.: Internet-basierte Bürgerhaushalte nicht überschätzen; Konrad Adenauer Stiftung, at http://www.kas.de/wf/de/71.9809/

[3] FISHKIN, J.S.: Democracy and Deliberation: New Directions for Democratic Reform. Yale University Press, New Haven, CT, 1991.

[4] FISHKIN, J.S.: The Voice of the People: Public Opinion and Democracy. Yale University Press, New Haven, CT.

[5] VELIKANOV, C. and PROSSER, A.: Mass Online Deliberation in Participatory Policy-Making – Part I in: PAULIN, A.: Beyond Bureaucracy, Springer, Berlin, 2017, forthcoming.

[6] VELIKANOV, C.: Deliberativeness and other important characteristics of e-participation. Proceedings of the EDEM Conference 2011, Austrian Computer Society, Vienna, 2011.

[7] FILLMORE-PATRICK, H.: The Iceland Experiment (2009–2013): A Participatory Approach to Constitutional Reform. Democratization Policy Council (DPC) Policy Note, New Series # 02, Sarajevo, 2013.

[8] LANDEMORE, H.: Inclusive Constitution-Making: Epistemic Considerations on the Icelandic Experiment. European Consortium for Political Research Convention, Bordeaux, France, September 2013, download from https://press.ecpr.eu/Events/PaperDetails.aspx? PaperID =5097& EventID=5.

[9] JONSSON, M.E.: Democratic Innovations in Deliberative Systems – The Case of the Estonian Citizens' Assembly. Journal of Public Deliberation, Vol. 11 (1), 2015.

[10] AITAMURTO, T. and LANDEMORE, H.: Five design principles for crowdsourced policymaking: Assessing the case of crowdsourced off-road traffic law in Finland. Journal of Social Media for Organizations, Vol. 2(1), 2015.

[11] VELIKANOV, C. and PROSSER, A.: Mass Online Deliberation in Participatory Policy-Making – Part II in: PAULIN, A.: Beyond Bureaucracy, Springer, Berlin, 2017, forthcoming.

[12] National Socialist Party of America et al. v. Village of Skokie, U.S. Supreme Court Docket No. 76-1786, 97; S. Ct. 2205; 53 L. Ed. 2d 96.

[13] MÜLLER-TÖRÖK, R.: Falschmeldungen: Verbotsvorschläge bewegen sich jenseits aller Realität, in: Staatsanzeiger, 27. Januar 2017, Stuttgart.

[14] PEUKERT, A.: Kurzer Prozess mit der Meinungsfreiheit; Cicero, download at http://cicero.de/berliner-republik/netzwerkdurchsetzungsgesetz-kurzer-prozess-mit-der-meinungsfreiheit

[15] Communications Assistance for Law Enforcement Act (CALEA); Pub.L. 103−414, 108 Stat. 4279, H.R. 4922.

[16] SÜDDEUTSCHE ZEITUNG: Eine Stadt verschwindet, online edition 17/2/2012, retrieved at http://www.sueddeutsche.de/muenchen/facebook-auftritt-von-muenchen-eine-stadt-verschwindet-1.

[17] DERSTANDARD: Facebook:StrachenichtwegenNSA-Kritikgesperrt. Online edition17/2/2012, retrieved at: http://derstandard.at/1373512300414/Facebook-sperrt-HC-Strache-aus.

[18] ERTL, S.: Protest als Ereignis – Zur medialen Inszenierung von Bürgerpartizipation. transcript Verlag, Bielefeld, 2015.

[19] NOBLE, D. and RITTEL, H.W.J.: Issue-Based Information Systems for Design. Proceedings of the ACADIA `88 Conference, Association for Computer Aided Design in Architecture, University of Michigan.

[20] Web Accessibility Initiative: WAI Guidelines and Techniques; at https://www.w3.org/WAI/guid-tech

[21] Bundesgesetz über Regelungen zur Erleichterung des elektronischen Verkehrs mit öffentlichen Stellen (E-Government-Gesetz - E-GovG); available at https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=20003230

[22] SPERONI DI FENIZIO, P. and VELIKANOV, C.: System Generated Requests for Rewriting Proposals. Proceedings of the ePart 2011 conference; download from https://arxiv.org/abs/1611.10095

Privacy and Data Protection

E-GOVERNMENT, TRANSPARENCY AND PERSONAL DATA PROTECTION. A NEW ANALYSIS' APPROACH TO AN OLD JURIDICAL ISSUE

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Abstract

In recent years, many governments increased transparency, publicity and free access in their activities. Information and communication technologies (ICTs) are seen as a powerful tool to reduce "public diseases" such as low citizen trust, bad performance, low accountability and corruption. While some of these efforts have received a considerable attention, the balance between the value of transparency and the necessity of protecting individual's personal rights has not been widely considered. It is an obvious fact that administrative records and documents may contain personal data, so it has become necessary to guarantee citizens' privacy and respect the principles set forth in the European legislation. Information can indeed become more damaging if spread on the web rather than through conventional channels. Therefore, personal identity has to be protected through the removal of information which it is no longer necessary to process.

In this scenario, the present work analyses the main measures public administrative bodies are required to implement, regardless of the purposes for which the information is posted online.

The analysis conducted will be a scholar reflection based on Directive 95/46/EC and recent "Regulation (EU) 2016/679 of the European Parliament ad of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation)". The paper will introduce a perspective concerning three different topics, namely the right to personal data protection, the data quality and the principle of proportionality. The road map will be as follows: to clarify the notion of data quality, to analyze the link between this principle and the value of transparency of public administrative activities and finally to introduce the dimension of the protection of personal data as a relative and not as an absolute right.

1. Information as a personal identity component. Information as a "common good"

Web has become an extraordinary communication instrument and, as such, an important tool for Public Administrative Bodies (PAB) to ensure widespread knowledge of the information concerning organizational features of their own. The knowledge ensures transparency, enabling wide-ranging supervision of the PAB's capacity to achieve the respective objectives as well as of the mechanism in place to assess civil servants' performance. Publishing details about public sector subjects' private interests is part of a range of measures used to manage potential conflicts of interest and to increase accountability. It would be, however, oversimplistic to assume that the transparency is (only) a control instrument. The transparency is much more, guaranteeing the

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citizens participation in public life[2]. Citizens, through the implementation of the transparency principle, participate in the public interest selection. In other words, through the transparency, sovereignty has declined in administrative proceedings. Impartiality, transparency and professional conduct amongst public sector subjects is recognized as a key to ensuring excellence and quality in the performance of relevant public positions. Then, the use of Information Technologies (IT) improves efficiency of public services, reducing the distance felt by citizens towards the public administration. For example, a city hall portal enables citizens to interact online with the PAB, supplying information and applying for services without the costs of face-to-face and manual form processing [3].

Going now beyond the intuitive chance of IT, it is necessary to note that the balance between the use of IT and the necessity of protecting fundamental personal rights becomes particularly tricky. Indeed, information may contain personal data and, additionally, sensitive data and it is a fact that personal data constitute a fundamental component of the individual personal identity[3]. It is also well known that incomplete or incorrect information could have negative repercussions on the personal identity. At the same time, outdated information which does not represent the reality, can provide a representation of the individual which is untruthful or out of context. Hence, it becomes necessary to refer to the right to personal data protection as a complex instrument of the data subject's safeguard and, at the same time, of the controller's accountability[4]. So, to understand these concepts (protection of the data subject as the weak party of the relation and accountability), apparently contrasting, and their role as key elements of, as called in the legal literature, the "proactive approach to privacy" [4], it is useful to illustrate briefly the very essential points of the European legal framework.

We have to start from the rules set forth by the Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data[5]. It may appear superfluous to recall the Directive 95/46/EC, considering its repeal following the entry into force of the recent Regulation (EU) 2016/679 (General Data Protection Regulation or more simply GDPR); however, the operation is necessary to define the *ratio* of the personal data processing regulation.

The Directive 95/46/EC described an innovative model that has influenced decisively the approach of the European Legislator to the personal data protection: a model that has led to the transition from a protection guaranteed only in the case of information collected in automated form to a wider protection that includes all operations performed upon personal data, regardless of the methods adopted and the instruments used and, above all, based on a need of balance, as well expressed in the title "Directive on the protection of individuals with regard to the processing of personal data and on the free movement of such data". The real novelty of the European harmonization of the rules of personal data protection, started with the Directive 95/46/EC, is the recognition of the

[2] As stated by the recent Opinion 02/2016 on the publication of Personal data for Transparency purposes in the Public Sector, adopted on 8 June 2016 by Article 29 Data Protection Working Party: "the notion of transparency is linked with the principles of openness, good administration and good governance as enshrined in the Treaties (Articles 10 and 11 of the Treaty on European Union and Articles 15 and 298 of the Treaty on the functioning of European Union) and in the Charter of Fundamental Rights of the European Union (Article 41)".

[3] The term "identity", in this paper, refers to all personal attributes of the individual as a whole. In essence, it could be argued that identity is the uniqueness of each individual that distinguishes him/her, differentiating him/her from the others, and representing him/her in his/her diversity. On the notion of identity, as stated in this work, see [14].

[4] For the personal data protection's dimension as a fundamental right in European law, see: [6] [7] [9] [10] [11].

[5] Referring to the content of General Data Protection Regulation, Kuner use the emblematic term of "copernican revolution": see [8].

personal data value as information necessary for the functioning of the economic and social life. To point out this element, it is sufficient to consider some of the Recitals of the Directive: "whereas the economic and social integration resulting from the establishment and functioning of the internal market (...) will necessarily lead to a substantial increase in cross-border flows of personal data between all those involved in a private or public capacity in economic and social activity in the Member States; whereas the exchange of personal data between undertakings in different Member States is set to increase; whereas the national authorities in the various Member States are being called (...) to collaborate and exchange personal data so as to be able to perform their duties or carry out tasks on behalf of an authority in another Member State within the context of the area without internal frontiers as constituted by the internal market (Recital no. 5)" it is necessary "to remove the obstacles to flows of personal data", enhancing that "the level of protection of the rights and freedoms of individuals with regard to the processing of such data be equivalent in all Member States" (Recital no. 8).

Data processing is qualified as an essential element of economic and social progress, which must be ensured in respect of the rights and fundamental freedoms of individuals. It is a "principle of guarantee" that the data processing systems, being at the service of the person, must respect. In essence, the aim of the Directive 95/46/EC (as well as of the Regulation) -which must be kept in constant consideration to avoid the risk of distorting the meaning of the related provisions- is to maintain the balance between the free movement of personal data and the protection of the rights and freedoms of the person. The balance of the interests is innate to the complex nature of personal data: an essential element for the free movement of persons, goods and services and a personal identity component. It is the balancing of the interests to justify, for example, the irrelevance of data subject's consent for the lawfulness of the personal data processing, whenever the operation is instrumental to the execution of a task of public interest (art. 7, lett. f) of the Directive, confirmed by art. 6 (1), lett. e) of the GDPR.

2. The principle of "data quality"

The article 6 of the Directive 95/46/EC lays down the related rules to ensure the accuracy, completeness, relevance of the data processed and that they are not excessive in relation to the specific purpose pursued by the processing. Only such data shall be processed as are "adequate, relevant and not excessive in relation to the purpose for which they are collected or further processed" [2].

The purpose must have been specified in advance and made manifest by the controller to the data subject prior to, and in any event, not later than, the time when the collection of personal data occurs. The processing of personal data for undefined or unlimited purpose is unlawful. Specification of purpose is an essential first step in applying data protection laws and designing data protection safeguards for any processing operation. Indeed, specification of the purpose is a pre-requisite for applying other data quality requirements, including the adequacy, relevance, proportionality and accuracy of the data collected and the requirements regarding the period of data retention. The principle of purpose limitation -designed to establish the boundaries within which personal data collected for a given purpose may be processed and may be put to further use- is structured along two coordinates: the controller must inform the data subjects of the processing purposes (transparency) and data processed for one or more declared purposes may not in general be used for other purposes (limitation).

The principle of transparency requires that the purposes of the data processing are well defined and comprehensible for an "average" data subject without expert legal or technical knowledge[6].

According, instead, to the principle of limitation, legitimate processing is limited to its initially specified purpose and any new purpose of processing will require a separate new legal basis. The categories of data chosen for processing have to be necessarily specified in order to achieve the declared overall aim of the processing operations, and a controller should strictly limit collection of data only to information *directly* relevant for the specific purpose of the processing[7]. Let us take as an example a statement of the Italian Data Protection Authority (order dated September 7, 2011). In this case, the Italian Data Protection Authority has banned an online University from processing personal data of students collected in an online form that was used to remain constantly informed about the activities of University. As evidenced by the order, the online University processed also information -such as date and place of birth, social security number, citizenship- that were not relevant to the purposes of the processing. In addition to the ban from processing the irrelevant data, Authority has prescribed to change the mode of personal data collection, eliminating from the registration form the data that resulted excessive in relation to the aims pursued.

The principle of legitimate purposes limitation goes hand-in-hand with the principle of data minimisation. According to this principle, the processing of personal data is permitted only if it is required to achieve a specified purpose: if this scope can be accomplished with anonymous or pseudonymous data, then this latter modalities should be preferred [1] [5] [13]. In order to prevent unnecessary and potentially unlawful data processing, data controller must carefully consider which data are strictly necessary to perform the processing purposes, and erase data when those purposes have been served. The principle of data minimisation, not specified in the Directive 95/46/EC, is explicitly provided by Article 5 (1) lett. (c) of GDPR. According to this provision, personal data shall be "adequate, relevant and *limited to what is necessary* in relation to the purposes for which they are processed". This therefore also entails that data processing systems are to be designed and selected in accordance with the aim of collecting, processing or using no personal data at all, or as few personal data as possible. As already pointed out, the accuracy of data, including updating, is an absolute necessity, in light of the potential damage that might be caused to the data subject due to data inaccuracies. Only information that is qualitatively correct, provides a correct representation of the individual [12]. If it is true that only accurate information provides a valuable instrument to protect fundamental rights, at the same time the requirement of completeness and updated collection of information may be a relevant instrument to prevent the creation and diffusion of untrue,

[6] The importance of the principle of transparency is crucial for the personal data protection. As stated in the Recital no. 39 of GDPR: "it should be transparent to natural persons that personal data concerning them are collected, used, consulted or otherwise processed and to what extent the personal data are or will be processed. The principle of transparency requires that any information and communication relating to the processing of those personal data be easily accessible and easy to understand, and that clear and plain language be used". Therefore, it is evident that through transparency the right to protection of personal data is recognized as right to informational self-determination and the data subject can exercise an effective control over his/her personal identity.

[7] On April 2, 2013 the WP29 provided an opinion on the principle of purpose limitation. The opinion analyses both components ("building blocks", in the words of the WP29) of the purpose limitation principle: (1) purpose specification; and (2) compatible use, or the requirement that any further processing must be compatible with the original purpose for which the personal data were collected. After stating that the "compatible use" requirement needs to be assessed on a case-by-case basis, the opinion points out the key factors that should be taken into account in this analysis: the relationship between the purposes for data collection and the purposes for further processing; the context in which the data have been collected and the reasonable expectations of the data subjects regarding further use of the data; the nature of the data and the impact of the further processing on the data subjects; and the safeguards put in place by the data controller to ensure fair processing and prevent undue harm to data subjects.

incomplete, or outdated information, likely to create untrue opinion, up to being discriminatory. These considerations may assume a significant importance if contextualized in the digital world, where it may be very difficult to remove an incorrect information. The time factor becomes then relevant, and likewise the analysis of elements such as the purpose of the data processing and of the (particular) context of the purpose of data processing.

Therefore, it is necessary to guarantee the limited retention of data principle. This requires ensuring that the period for which the personal data are stored is limited to a strict minimum. This is a procedural rule that formalizes the principle of limitation purposes. The processing and the data that are the object of the processing are linked to a specific aim, and it is on this relationship of necessary instrumentality that the legitimacy of the operations is based. It is irrelevant whether personal data (in the association between the name and other information) assume a derogatory nature or, more generally, is invasive of data subject's personal identity. What is relevant is the function of the original collection of personal data, or the purpose declared by the data controller: if these are no longer in effect, personal data must be erased. If it is evident that this rule derives from the said above "data minimisation" principle, the operation to determine the "expiration time" of a processing of personal data is not so obvious. The time limitation for storing personal data applies, however, only to data kept in a form that permits identification of data subjects. Lawful storage of data that are no longer needed could, therefore, be achieved by anonymization of the data.

3. Quality of Information as a multi-dimensional principle

We can assume that quality of information is one of the key criteria of data protection. The legitimacy of the data is subject to compliance with this general principle, representing the most important element for protecting personal identity. As said, this principle includes the following rules: "limitation", which prohibits the processing of personal data "in a way incompatible" with specified and known (by data subjects) purposes; "limited retention or storage limitation", which requires the deletion of personal data that are no longer necessary to achieve the objectives of the processing of the data; finally, "data minimization", which requires that every data controller limits much more strictly the amount of data they collect. As said before, the Article 5 of GDPR confirms the principles according to which personal data may be processed, only insofar as it is adequate, relevant and not excessive in relation to the purposes for which they are collected. Nevertheless, General Data Protection Regulation emphasizes data minimization principle and value of transparency, rules that have to be calibrated to the status of the data subject.

It is necessary to point out another element. The respect of data quality rules goes hand-to-hand with the principle of accountability. The controller has to ensure that only accurate, complete and up-to-dated data are processed. Every reasonable step must be taken to ensure that data that are inaccurate or incomplete, having regard to the purposes for which they were collected or for which they are further processed, are erased or rectified. A critical element can be established: the "reasonable measures". The concept of reasonableness may appear indeed vague. It is possible to discuss its content in the light of the general criteria listed by GDPR: the nature of data; the data processing purposes; the preliminary and necessary analysis of the data processing risks and the state of the art of the knowledge about technical security measures. Therefore, some useful tools may consist of checks at the time of collection, periodic checks or use of a software that prevents the acquisition of incomplete, irrelevant, or inaccurate data.

It is clear that the rule framework appears complex and some requested measures may be hard to adopt, but we can consider unquestionable the following element. There is a need to stress the

accountability -and the GDPR goes in this direction- requiring data controller's awareness of the nature and the purposes of the processing, and also of the risks of the data processing: therefore in practice, a preliminary analysis of the context. Therefore, PBA, as data controllers, must consider processing within organizations separately from the purpose of publishing personal data. Then, when deciding whether to make information containing personal data available on-line, PBA should always bear in mind the consequences of doing so. It is much more than a responsibility issue. It is a selective approach to personal data protection, differentiating between different nature, cases and purposes, and taking into account specific situations with regard, for example, to the content of the personal details being published. In essence, different methods of processing data for different contexts. In this way, the fulfillment of the proportionality requirement can be effectively assured. Applying this approach, also the period for retaining personal data should be determined according to the legitimate purposes for which they are held. So, processing within competent institutions should be considered separately from the purpose of publishing personal data.

4. An attempt to a selective approach. The Italian Data Protection Authority's Guidelines for the personal data processing by Public Administrative Bodies for publicity and transparency purposes

In 2014 the Italian Data Protection Authority established specific guidelines to be complied with by PAB when posting administrative records and documents that contain personal data, in order to avoid the violation of citizens' and employees' privacy, and to respect the above described data quality principle. The Guidelines point out a very specific set of arrangements PAB are required to implement regardless of the purposes for which the information is posted online (transparency, publicity, access)[8]. First of all PAB may post, on their official website, records and documents containing personal data only if this dissemination is determined by law or by a regulation. The publication must be appropriate in order to attain the objective pursued, and not go beyond what is necessary to achieve it. Then, PAB have to distinguish the nature of the data. Non-sensitive personal data, for example name and surname, can be published in compliance to the data quality principle. Sensitive or judicial data can be published if supported by a specific legal basis and always taking into consideration the appropriate balancing between data protection and the legitimate public interest[9]; health or sexual orientation data cannot be in any case published. On the contrary if there is not a law or a regulation that allow personal data publication in the website, the publication is legitimate only if data is anonymized. On this last element, the Guidelines states that, in order to anonymize a document, it is not adequate to replace the name with the initials of the person, but it is necessary to completely obscure the name and other information related to the person that may allow identification.

The other main rules stated by the Guidelines can be summarized as follows:

[8] See Article 29 Data Protection Working Party, Opinion 02/2016 on the publication of Personal data for Transparency purposes in the Public Sector.

[9] According to Article 4 (1), lett. d) of the legislative decree no. 196 of 30 June 2003 (Personal Data Protection Code), sensitive data consists of "personal data allowing the disclosure of racial or ethnic origin, religious, philosophical or other beliefs, political opinions, membership of parties, trade unions, associations or organizations of a religious, philosophical, political or trade-unionist character, as well as personal data disclosing health and sex life"; the following lett. e) defines as "judicial", "personal data concerning the criminal record office, the register of offence-related administrative sanctions and the relevant current charges, or the status of being either defendant or the subject of investigations".

- appropriate technological measures should be taken to prevent the online information from being erased, changed or extrapolated;

- the documents should be retrieved, if possible, by way of internal search engines, whilst the indexing of such documents by external search engines should be limited. Relying on internal search engines can ensure that access will be consistent with the purposes for which the information was disclosed as well as preventing the data from being tampered with or taken out of their context;

- the data must remain available for a period no longer than what is necessary in accordance of the sector-related legislation;

- alert systems and software should be deployed to prevent reproduction and re-use of the files containing personal data; such systems can detect and report any dubious access to take the adequate countermeasures.

Therefore, in conclusion, we can say that the Guidelines confirmed the selective approach to the personal data protection. Considering the particular context, the Italian Data Protection Authority has strengthened PBA's duties as data controllers, by improving technical measures of security and control mechanisms by default.

5. Absoluteness and relativity of the right to personal data protection. Recital 4 of the General Regulation Data Protection

In this scenario, Recital no. 4 of the GDPR assumes a very significant relevance. According to this provision: "the processing of personal data should be designed to serve mankind. The right to the protection of personal data is not an absolute right; it must be considered in relation to its function in society and be balanced against other fundamental rights, in accordance with the principle of proportionality. This Regulation respects all fundamental rights and observes the freedoms and principles recognised in the Charter as enshrined in the Treaties, in particular the respect for private and family life, home and communications, the protection of personal data, freedom of thought, conscience and religion, freedom of expression and information, freedom to conduct a business, the right to an effective remedy and to a fair trial, and cultural, religious and linguistic diversity". The provision is clear: the right to personal data protection is absolute, considering that it is recognized to anyone; it is relative, considering the possible external constraints that restrict or limit the exercise of the right. In other words, relativity should be referred to the content of the right to personal data protection, that is to all claims that can be exercised by the data subject, not to the right as such. The content of the right is relative since data subject's powers may be restricted, in light of the necessary balancing between individual interests and collective values. The assumption that the exercise of the right to protection of personal data may be restricted -even if it assumes an emblematic relevance given its location in an initial Recital of the GDPR[10]- is not new in the European legal framework about personal data protection. In relation to the right to privacy, to which, as is well known, the right to protection of personal data is linked by a bond of interdependence, Article 8, (2) of the European Convention on Human Rights provides the possibility of authorities' interference for reasons of public interest. Similarly Article 9, (2) of the

[10] The recitals aren't a mere introduction to the legislative text, but a part essential for its understanding and application. See Court of Justice, 25 October 2011, eDate Advertising, C-509/09 and Martinez, C-161/10, par. 54 e 55, available at *http://curia.europa.eu*.

Convention on the Protection of Individuals in regard to the Automatic Processing of Personal Data admits the possibility of restrictions of the right, in case these are necessary measures "protecting State security, public safety, the monetary interests of the State or the suppression of criminal offences, data subject or the rights and freedoms of others". The need to operate a balance between individual and collective interests is expressed also by art. 52, (1) of the Charter of Fundamental Rights, which states that: "any limitation on the exercise of the rights and freedoms recognised by this Charter must be provided for by law and respect the essence of those rights and freedoms. Subject to the principle of proportionality, limitations may be made only if they are necessary and genuinely meet objectives of general interest recognised by the Union or the need to protect the rights and freedoms of others". The provision, significantly entitled "Scope and interpretation of rights and principles", states that the rights recognized by the Charter, although relating to the protection of the personal freedom dimension, may be subject to limitations justified by public interest purposes. Then, it is the "relational nature" of the rights that justifies the possible restriction of their content in light of a general interest. It is the social need that goes beyond the individual prerogative, legitimizing powers' restrictions; so in this restriction, the right, a fundamental claim of the individual, sees affirmed its social dimension limited by the relationship with others. These considerations do not call into debate the substance of the right, but its concrete activity in relation to aims that exceed the individual dimension. Restrictions must be reasonable, commensurate to the purpose and their effects must be proportionate in regard both to the benefits and prejudices derived from them.

As said above, after providing that the right to protection of personal data is not an absolute right, Recital no. 4 of the GDPR adds that "this right must be considered in relation to its function in society". What does it mean that the right to protection of personal data should be considered in relations to its function in society? The "function" (which must be taken into consideration) must be referred to personal data. From an ontological point of view, the function is related to the right to protection of personal data, similarly to what happens for the right to property. It is a limit to the owner's claims, justifiable in the light of the object of the right. If the data can have a purpose that is external to the individual dimension of the data subject, or if it can have an impact on the other individuals' fundamental rights, or also if its processing is instrumental to social needs, then the fullness of the claims may be subject to a restriction. In summary, if the personal information is functional to satisfy an interest that goes beyond the boundaries of the "individual interest" of the data subject, it is legitimate and necessary to effect a limitation of the prerogative on the same data. Then, the expression "function in society" appears as the criterion of argumentation in which it is possible to decline the relativity established for the right to personal data protection.

Concluding, we can say that Recital no. 4 of GDPR confirms the above-illustrated system built by the Directive 95/46/EC and the determination argued by the European Court of Justice since the 70s[11]. The decisions of the European Court of Justice may then have been taken having in mind the abstract possibility that the (full) protection of a right, albeit a fundamental one, may have to be balanced with the need of ensuring economic freedoms[12]. The fundamental rights are not on an insuperable level of abstract inviolability. In other words, except for the right to life, other

[11] Court of Justice, 17 December 1970, Internationale Handelsgesellschaft, C-11/1970, available at *http://curia.europa.eu*; Court of Justice 14 May 1974, Nold Kohlen-Und Baustoffgrosshandlung, C-4/73, available at *http://eur-lex.europa.eu*. According to this last decision: "if rights of ownership are protected by the constitutional laws of all the Member States and if similar guarantees are given in respect of their right freely to choose and practice their trade or profession, the rights thereby guaranteed, far from constituting unfettered prerogatives, must be viewed in the light of the social function of the property and activities protected thereunder".

[12] Cass. civ., 17 luglio 2015, n. 15096, in *Giur. it*., 2015, p. 2651.

fundamental rights do not have an absolute value, but instead they a relative one, that may be declined along the coordinates of the proportionality. The need of balancing is justified in light of the individual's social dimension and the consequent reasonable equilibrium between idiosyncratic and collective dimensions.

A good opportunity to assess the repercussions of the proposed reconstruction is offered by a recent decision of the Italian Supreme Court of Cassation[13]. The case is related to the publishing - on the companies register of the Italian Chambers of Commerce- of personal data (name and surname) referred to a director of a bankrupted company, despite the previous removal of the company from the same register. The director has obtained in the first instance the deletion from the public register of personal data and compensation for damage. The Supreme Court has stayed the proceeding, submitting to the Court of Justice of the European Union two preliminary questions. The first question is related to the principle of data's limited retention, which requires the anonymization when the time necessary to achieve the purposes of primary collecting is expired. The Supreme Court has asked whether this principle should prevail over the rules about legal registers. The second question concerns the interpretation of Article 3 of the "First Council Directive 68/151/EEC of 9 March 1968 on co-ordination of safeguards which, for the protection of the interests of members and others, are required by Member States of companies within the meaning of the second paragraph of Article 58 of the Treaty, with a view to making such safeguards equivalent throughout the Community". The Supreme Court has asked if that provision enables the restriction of the publishing time in the companies register.

It is not possible here to consider thoroughly the Supreme Court decision. What can be said, however, is that the data registered in the public list are peculiar information in light of their function. These are economic information, subject to a system of advertising, whose free access guarantees the functioning of the market and protects the fairness of the relations established therein. Then, it is necessary to balance the right to personal data protection with the right (of third parties) to certainty of economic relations and business arrangements. Therefore, the right to protection of personal data may be subject to a restriction of content that translates into an impossibility to obtain the cancellation of the data from the public register.

6. Conclusion

The respect of personal data protection right is essential to guarantee democracy. It also true that enhancing data processing is relevant for economic and social progress. Moving from the assumption on the social connotation of personal data, this paper has delivered an overview of the current (related) European legislation, in order to demonstrate that if the data processing is instrumental to social needs, then the fullness of the individual right may be subject to a restriction. This paper affirms that data protection rules should be interpreted and consequently implemented in light of a necessary balance. It could be argued that personal data protection must be, on the contrary, strengthened and not limited, but this is may be misleading. Privacy and personal data protection should be incorporated in a selective approach in which the social function of the data, the processing purposes and the features of the data subjects acquire a particular relevance. By doing so, the duties (as well as the responsibilities) of the data controller will be improved, requiring to adopt internal procedures and implement specific measures, designed in light of the purposes and other above mentioned features, so to implement data-protection principles in

[13] Court of Justice, 12 June 2003, Eugen Schmidberger, Internationale Transporte und Planzuge v Republik Österreich, C-112/00, available at *http://eur-lex.europa.eu*.

advance. This is the direction of the recent GDPR that is, moreover, drawn in accordance with the aforementioned approach taken by the European Court of Justice to the more general subject of fundamental rights.

7. References

[1] AA.VV.: Lessons from the identity trail - Anonymity, privacy and identity in a networked society, Keer I., Steeves V., Lucock C. (ed.), Oxford University Press, 2009.

[2] BOSCO, F., CREEMERS, N., FERRARIS, V., GUAGNIN, D. and KOOPS, B-J.: Profiling Technologies and Fundamental Rights and Values: Regulatory Challenges and Perspectives from European Data Protection Authorities, in: S. Gutwirth, R. Leenes, P. de Hert (ed.), Reforming European Data Protection Law, Springer, 2015, p. 17.

[3] BROWN, I.: Working Paper no. 1, The challenges to European data protection law and principles, 20 January 2010, European Commission Directorate-General Justice, Freedom and Security, Comparative Study on different approaches to new privacy challenges, p. 9.

[4] CAVOUKIAN, A.: Evolving FIPPs: Proactive Approaches to Privacy, Not Privacy Paternalism, in: S. Gutwirth, R. Leenes, P. de Hert (ed.), Reforming European Data Protection Law, Springer, 2015.

[5] FINOCCHIARO, G.: Anonimato, in: Digesto delle discipline privatistiche, Torino, 2010, p. 12.

[6] FUSTER, G.: The Emergence of Personal Data Protection as a Fundamental Right of EU, Springer, 2014, p. 234 ss.

[7] KROTOSZYNSKI, R. J.: Privacy Revisited. A Global Perspective on the Right to be Left Alone, Oxford Press., 2016, p. 143.

[8] KUNER, C.: The European Commission's Proposed Data Protection Regulation: A Copernican Revolution in European Data Protection Law, in Privacy Security Law Report, 11, 2012.

[9] RODOTÀ, S.: Elaboratori elettronici e controllo sociale, Bologna, 1973.

[10] RODOTÀ, S.: Tecnologie e diritti, Bologna, 1995.

[11] RODOTÀ, S.: Data Protection as a Fundamental Right, in: Gutwirth et al. (ed.), Reinventing Data Protection?, Springer, 2009, p. 78.

[12] RICCI, A.: Quality of Information, Right to Oblivion and Digital Reputation (with G. Finocchiaro), in: B. Custers, T. Calders, B. Schermer, T. Zarsky (ed.), Discrimination in the Information Society, Springer, 2013, p. 289.

[13] RICCI, A.: Anonymity: a Comparison between the Legal and Computer Science Perspectives (with Mascetti S., Monreale A., Gerino A.), in: S. Gutwirth, R. Leenes, P. de Hert (ed.), European Data Protection: Coming of Age, Springer, 2013, p. 85.

[14] ZATTI, P.: Maschere del diritto, volti della vita, Milano, 2009, p. 35.

DISTRIBUTED VULNERABILITY ASSESSMENT APPLIED TO MEASURING CITIZEN CYBER-HEALTH AND SECURING ONLINE PUBLIC SERVICES

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Abstract
Since the introduction of personal computing over the Internet, cyber-security has developed primarily as commercial services providing protection to organizations and individuals as customers of paid services. However, since the introduction of cloud-services and smartphones over a decade ago, this development has been radically altered. Effective cyber-security can no longer be provided as simplistic protective walls around trusted zones of computing (for organizations: isolated private corporate networks with secure network gateways; for individuals: stand-alone personal computers protected by locally-running anti-virus applications). These approaches have always assumed that cyber-threats do not originate from inside trusted zones. Increasingly, cyber-security is more effectively achieved through detecting and mitigating vulnerabilities discovered through coordinated assessment of malware threats, user behaviors, and IT infrastructure weaknesses. Unlike the traditional focus on malware threats alone, this integrated approach treats the IT infrastructure and user behavior of each individual and each organization department separately. This distributed approach makes no assumptions about the origins of cyber-threats.

In this paper, we examine the implications of using this distributed approach in the public sector. Particular emphasis is placed on aspects where the traditional framework of cyber-security as a commercial service can be usefully abandoned and replaced by more effective public sector practices. The recent evolution of the Digital Divide in Central and Eastern Europe has not been a simple story of those with less opportunity and access (old, poor, less educated) being able close the gap by "catching up" with those of greater opportunity and access (young, wealthy, well educated). Rather, the closing of the Digital Divide has been achieved more through the adoption of very different digital activities provided through very differently organized services – activities and services that require very different public sector approaches to cyber-security. These include new approaches to measuring citizen cyber-health; making citizens savvier about their personal cyber-security; and providing more secure online public services.

Key words: *distributed vulnerability analysis, citizen cyber-health, public services cybersecurity.*

1. Introduction

Information technology remodels the way how businesses and public services operate. It makes tremendous opportunities to increase revenues, cut costs and provides new feasibilities for customers. However an enterprise needs to control and manage the security of digital information in order to retain value from IT. The most important problems are data breaching and the growth of cyber-attacks. These incidents can result in substantial financial losses for business, governments

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and individuals. In order to achieve digital enterprise success, effective security initiatives and targeted protections are necessary to reduce or mitigate security risks.

Information security becomes more and more wide-reaching and crucial for every enterprise network. Traditional firewalls and intrusion prevention systems unable to provide entirely sufficient protection from malicious activities. Operational technology and the Internet of Things (IoT) [13] massively expand the scope of security strategy and operations. All systems, networks and application require a through and continuous review of all aspects of security. It includes everything from policy and planning to technologies, deployment, operations, and upgrades. In order to be able to maintain foundational IT capabilities and services security awareness trainings, employee behavior monitoring also necessary.

Network and system administrators are faced with different types of network attacks, and try to mitigate their impact. These attacks may come with different forms of malware, like viruses, worms, botnets or other types of intrusion. Even though the effectiveness of security controls to protect information is increasing, people may remain susceptible to manipulation.

Cybersecurity metrics generally combine results of protected IT (e.g., ongoing penetration testing) [14], malicious activities (e.g., breach detection testing) [15] and user behavior monitoring (e.g. probing user responses with fake phishing) [16, 17, 18]

Three distinct but highly interactive sources of vulnerability are considered [1]:

(1) Malicious activity by those who would subvert network capabilities for their own gain in violation of intended trusted relationships within the protected IT network;

(2) Disruptive and dangerous IT behaviors by network users (e.g., employees, customers, suppliers) in using IT network capabilities; and

(3) Unprotected vulnerabilities in the IT network infrastructure.

2. The triunal model of cyber-health

We adopt the concept of citizen cybersecurity [2]. Citizen cybersecurity becomes relevant to government agencies when citizens use their own personal computers to transact business with government, as in passport applications or online voting [3]. Both citizen trust and government technical efficacy rely on the integrity of online computer interactions between citizen and government [4]. Any real or perceived vulnerability of citizen-government information transactions to malicious activity undermines this integrity. The collective condition of each citizen's cybersecurity is thus a relevant matter for government. We call this collective condition citizen cyber-health [5]. Citizen cyber-health becomes relevant when a citizen's personal computer becomes infected with malware. A malware-infected personal computer may act against the interest of both the citizen and the government.

Consider an analogy with online banking: a depositor's malware-infected personal computer may act against the interest of both the depositor and the bank – no matter the security of the bank's servers and applications. Just as banks have an interest in the cyber-health of their online customers' computers, so governments have an interest in the cyber-health of their citizens' personal computers when they are used for online government activities.

Despite the best efforts of IT service providers, government regulators and law enforcement, responsibility for online security falls chiefly on individual citizens, whether as family members, employees, or government officials [6]. Measures of individual citizen cybersecurity health are useful indicators of broader citizen cyber-health vulnerabilities – especially for monitoring system activity, identifying and predicting areas for improvement, and evaluating ongoing changes [7, 8].

Vulnerability assessment may be thought of as the outermost layer in the ongoing provision of enterprise cybersecurity. The succeeding layers include: vulnerability detection, vulnerability remediation, security incident preparedness, security incident detection, and security incident response (Figure 1).

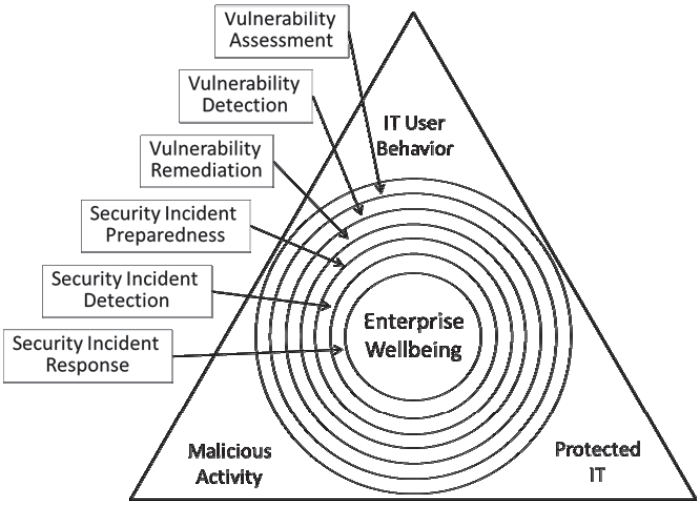

Figure 1: Vulnerability assessment within the context of overall cybersecurity contribution to enterprise wellbeing

To effectively contribute to enterprise wellbeing, vulnerability management requires practical and useful correlation of the various and highly interactive sources of vulnerability. The analogous requirement for security incident response is typically satisfied by security event information management systems (SEIM) [9]. For vulnerability management, we have adopted what we define as the Triunal Model of Cybersecurity Vulnerability. Derived from earlier formulations [10, 11], the triunal model decomposes vulnerability assessment into three contributing sources, or triunes: i) malicious activity; ii) unprotected IT; and iii) facilitating adverse user behavior. Within each contributing source, specific contributing factors are identified and characterized (e.g., social engineering and exploits within the malicious activity triune). The model provides a basis for correlating and combining contributing factors into an integrated view of specific vulnerabilities [12].

3. Estimating the vulnerability level

In an earlier publication [1] the basic components and assumptions of our vulnerability assessment method are defined. There are numerous threats that can have impact on the vulnerability level of an examined infrastructure. The vulnerability level of the infrastructure is defined as a probability of at least one threat is able to be executed on at least one device used by the given users in the infrastructure.

In order to be able to create a formal description et us define the followings:

L: set of all available threat landscapes (e.g.: World, Europe, USA, Hungary, …)
T_{all}: set of all possible malware
(note: at this moment we are focusing of the subset of threats, we are dealing with only the programmed attacks)
T_l: set of all possible malware inside $l \in L$, $T_l \subset T_{all}$

U: set of all users
I: set of all possible devices
P: set of all available protections
UT: set of all possible user tricks used by any malware in T

An integrated measure of vulnerability can be derived accounting for all three sources (attacker ingenuity, infrastructure weakness, adverse user behavior). For any given malware or class of malware for which the requisite IT infrastructure vulnerability and user facilitation is known, we can obtain a best estimate of:

1. The probability that an attacker will use a particular malware or class of malware against the enterprise (p_{prev}):

$$p_{prev}(t,l) = \frac{number\ of\ computers\ infected\ by\ \boldsymbol{t}\ inside\ \boldsymbol{l}}{number\ of\ all\ computers\ inside\ \boldsymbol{l}}$$

where $t \in T_l$ and $l \in L$;

2. The probabilities that the enterprise's IT infrastructure will allow the attack to be carried out successfully (p_{device}):

$$p_{prot}(t,p) = \frac{number\ of\ successfull\ attempts\ of\ \boldsymbol{t}\ thru\ the\ protection\ \boldsymbol{p}}{number\ of\ all\ attempts\ of\ \boldsymbol{t}\ thru\ the\ protection\ \boldsymbol{p}}$$

where $t \in T_l$, $l \in L$ and $p \in P$;

$$p_{device-prot}(t,i) = \min_{for\ all\ p\ protecting\ i} p_{prot}(t,p)$$

where $t \in T_l$, $l \in L$ and $i \in I$;

$$p_{device-elements}(t,i) = \begin{cases} 1, & if\ t\ can\ work\ on\ i \\ 0, & if\ t\ can\ not\ work\ on\ i \end{cases}$$

where $t \in T_l$, $l \in L$ and $i \in I$;

$$p_{device}(t,i) = p_{device-elements}(t,i) \cdot p_{device-prot}(t,i)$$

where $t \in T_l$, $l \in L$ and $i \in I$;

3. The probability that users of the enterprise's IT infrastructure will provide sufficient facilitation for the attack to succeed ($p_{usertrick}$, p_{user}, p_{usage}):

$$p_{usertrick}(t,ut) = \frac{number\ of\ attempts\ of\ \boldsymbol{t}\ where\ t\ used\ \boldsymbol{ut}}{number\ of\ all\ attempts\ of\ \boldsymbol{t}}$$

where $\in T_l$, $l \in L$, $ut \in UT$;

$$p_{user}(u, ut) = \frac{number\ of\ successfull\ attempts\ of\ \boldsymbol{ut}\ on\ \boldsymbol{u}}{number\ of\ all\ attempts\ of\ \boldsymbol{ut}\ on\ \boldsymbol{u}}$$

where $u \in U$, $ut \in UT$;

$$p_{usage}(u, i) = \frac{all\ time\ when\ u\ used\ i}{measuring\ interval}$$

where $u \in U$, $i \in I$;

The three main input classes (p_{prev}, p_{device}, $p_{usertrick}$ and p_{user}) can be combined to obtain an overall probability of malicious success (provided each relevant combination of attack, user, and component of IT infrastructure is accounted for):

$$q(l, i, ut) = 1 - \prod_{t}(1 - p_{usertrick}(t, ut) \cdot p_{prev}(t, l) \cdot p_{device}(t, i))$$

where $u \in U$, $i \in I$, $t \in T_l$, $l \in L$;

$$r(l, u, i) = 1 - \prod_{ut}(1 - q(l, i, ut) \cdot p_{user}(u, ut))$$

where $u \in U$, $i \in I, ut \in UT$, $l \in L$;

$$s(l) = 1 - \prod_{u,i}(1 - r(l, u, i) \cdot p_{usage}(u, i))$$

where $u \in U$, $i \in I$ and $l \in L$;

Separately measured combined probabilities of malicious success (p_{s1}, p_{s2}, p_{s3}, …) can be compared and prioritized. Subsequently, an identified high priority vulnerability (p_{si}) can be decomposed into its constituent vulnerability sources (p_{ai}, p_{bi}, p_{ci}) allowing remedial actions to be directed where the greatest measureable improvement can be made.

The calculated *s(l)* is a metric related to the vulnerability level of an organization using the calculated devices by the calculated users against the calculated threats. As it is a probability it has to be in the [0,1] interval and the higher value means more vulnerable situation. If the elements (threats, devices and users) are fixed then by adding any new element the *s(l)* vulnerability level will be the same or it will be increased.

4. The effect of correlation

The earlier introduced formulas are proper only if the introduced probabilities are independent from each other. In real life this ideal situation rarely occurs.

On the one hand we identify correlation between two elements of the triunial model. For example *threat1* can open a backdoor on a targeted system, and *threat2* can use that opened communication channel for its distribution. This exactly means that above formula needs to be extended towards conditional probabilities.

On the other hand if the state of a system are known, the probability of the another similar system are in the same state are greater if exist some type of relationship between them. For example let us

consider there are two cities *city A* and *city B*. Denote *p(A)* the probability of the weather in *city A* is rainy, *p(B)* should be the same for *city B*. If the cities are not so far from each other the difference between *p(A)* and *p(B)* can't be any size.

If we want to estimate that one of the cities the weather is rainy the probability of that (p_r)

$p_r <= 1-(1-p(A))*(1-p(B))$

In this case we can estimate with another formula p_r probability:

$p_r >= max(p(A), p(B))$

Writing these formulas together:

$max(p(A), p(B)) <= p_r <= 1-(1-p(A))*(1-p(B))$

This exactly means that the p_r probability are limited and exact value of that depends on correlation of different factors.

In this example it can be determined that distance mainly influences the likelihood of the same event. It also can be considered that the root cause of the state can be the same. The level of correlation will determine that the lower bound or upper bound estimate will produce better estimate.

If we want to adopt this into estimating the cyber-health of an information system we need to identify common factors someway and our estimate formula can be more accurate.

5. Conclusion

In this paper we demonstrate that the triunal model of cybersecurity vulnerability is largely fit to model cyber health. All important aspect of cybersecurity vulnerability are considered. The probabilities used in formulas can be calculated evaluating properties of threats, IT infrastructure component, user behavior and applied protections. In order to improve the estimation we need to consider correlation between components of our model.

6. References

[1] LEITOLD, F., ARROTT, A. and HADARICS, K.: Quantifying cyber-threat vulnerability by combining threat intelligence, IT infrastructure weakness, and user susceptibility 24th Annual EICAR Conference, Nuremberg, Germany, 2016.

[2] HARKNETT, R. J. and STEVER, J. A.: The cybersecurity triad: Government, private sector partners, and the engaged cybersecurity citizen. Journal of Homeland Security and Emergency Management 6.1, 2009.

[3] HILBERT, M.: The maturing concept of e-democracy: from e-voting and online consultations to democratic value out of jumbled online chatter. Journal of Information Technology and Politics, 6.2, 2009, p. 87–110.

[4] JORBA, A. R., RUIZ, J. A. O. and BROWN, P.: Advanced security to enable trustworthy electronic voting. Third European Conference on e-Government, 2003.

[5] ARROTT, A., LALONDE LEVESQUE, F., BATCHELDER, D. and FERNANDEZ, J. M.: Citizen cyber-security health metrics for Windows computers. Proceedings of Central and Eastern European eGov Days Conference, CEEEGOV, Budapest, Hungary, 2016.

[6] AHN, M. J., PARK, T.H. and LIM, C.H.: What Matters in Cybersecurity? The Role of Citizen Perception and Attributes. IJeN 3.1, 2015, p. 1-22.

[7] BERTOLLO, P.: Assessing ecosystem health in governed landscapes: a framework for developing core indicators. Ecosystem health, 4(1), 1998, p. 33–51.

[8] KSHETRI, N.: Cybercrime and Cybersecurity in the Middle East and North African Economies. Cybercrime and Cybersecurity in the Global South. Palgrave Macmillan UK, 2013.

[9] Microsoft. Evolution of malware and the threat landscape – a 10-year review, 2012.

[10] LEITOLD, F. and HADARICS, K.: Measuring security risk in the cloud-enabled enterprise. Malicious and Unwanted Software (MALWARE), 7th International Conference on Malicious and Unwanted Software, 2012, pp: 62-66.

[11] LEITOLD, F.: Security Risk analysis using Markov Chain Model. 19th Annual EICAR Conference, Paris, France, 2010.

[12] LEITOLD, F., ARROTT, A. and HADARICS, K.: Automating visibility into user behavior vulnerabilities to malware attack, Proceedings of the 26th Virus Bulletin International Conference (VB2016), pp. 16-24, Denver, USA, 2016.

[13] URIBEETXEBERRIA, R., ESKOLA, M.G., TRONO, L., GALILEO, S., MOVATION, J.N., DE CELIS ACORDE, L., MORGANI, A., SELEX, E.S., BALDELLI, R., TECNALIA, I.E. and HAI, N.P.: New embedded systems architecture for multi-layer dependable solutions. http://www.newshield.eu/wp-content/uploads/2013/11/ NSHIELD-D8.6_Build_Secure _Systems_with_SHIELD_v2.pdf

[14] Pwnie Express, Vulnerability assessment and penetration testing across the enterprise, Whitepaper, 2014, http://www.pwnieexpress.com

[15] EDWARDS, S.E., FORD, R. and Szappanos, G.: Effectively testing APT defenses. Virus Bulletin Conference, Prague, Czech Republic, 2015.

[16] CHAPMAN, M.T.: Advanced Persistent Testing: How to fight bad phishing with good, PhishLine, 2015, http://www.phishline.com/advanced-persistent-testing-ebook

[17] CHAPMAN, M.T.: Establishing metrics to manage the human layer. ISSA Security Education Awareness Special Interest Group, 2013.

[18] LALONDE LEVESQUE, F., FERNANDEZ, J. M., and SOMAYAJI, A.: Risk prediction of malware victimization based on user behavior. Malicious and Unwanted Software: The Americas (MALWARE), 2014 9th International Conference on IEEE, 2014.

A SYSTEMATIC REVIEW ON PROCESS MINING AND SECURITY

Robert Kelemen[1]

Abstract
Security is an important issue that every organisation should address. One approach to secure systems could be the use of process mining techniques. Process mining is an emerging discipline which can extract knowledge from event logs that are available in information systems. In the security context, process mining is used to analyse security trails to detect anomalies in process execution. While some of the data mining projects are already implemented in banking, insurance and telecom sector the interesting question is: What is happening in public sector? This paper investigates the research on process mining techniques in security domain and tries to discover the examples of its implementation especially in public sector.

The systematic review has been conducted in order to give an overview of state-of-the-art process mining techniques used in security context, to classify the main areas of development, algorithms, tools and to identify possible future research course.

1. Introduction

The basic idea for this research was to explore the relevant databases and find out what are the common ways of implementing the process mining techniques in the field of security, with special emphasis on usage in public domain. Nowadays, the security field is very interesting and challenging. Especially regarding the interconnected systems. One thing is sure, organizations use more and more different systems, generate more and more data, and inevitably, more and more data about data (event logs) and, despite all the security systems implemented, they are still vulnerable. The security is becoming the key challenge. Usually, analysing the event logs is a very boring job, it takes a lot of time and it is usually performed with the focus on one system only. That could cause security breaches in systems. One approach to raise security of information systems could be to use process-mining techniques. Therefore, it is necessary to define the process mining.

1.1 Process mining

The organizations use different systems and generate event log data. The challenge is to exploit event data in a meaningful way, to provide insights, identify bottlenecks, anticipate problems, record policy violations, recommend countermeasures, and streamline processes [1]. This is the W. M. P. van der Alst's explanation of the "philosophy" of process mining.

A group of 75 people from more than 50 organizations, in the IEE Task Force on Process Mining created the Process Mining Manifesto. This is the set of guiding principles and challenges whose purpose is to serve as a guide for software developers, scientist, consultants, business managers and end-users [2]. Process mining is a relatively new research discipline that comes between computational intelligence and data mining on the one hand, and process modelling and analysis on

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the other hand [2]. The idea of process mining is to discover, monitor and improve real processes by extracting knowledge from event logs readily available in today's (information) systems. Process mining includes (automated) process discovery, conformance checking, social network/organizational mining, automated construction of simulation models, model extension, model repair, case prediction, and history-based recommendations [2]. Process mining provides an important bridge between data mining and business process modelling and analysis [2]. A Starting point for process mining is an event log. All process mining techniques assume that it is possible to sequentially record events so that each event refers to an activity and is related to a particular case [3]. Event logs may store additional information such as the resource executing or initiating an activity, the timestamp of an event, or data elements recorded with an event [3].

Some authors [4] have already undertaken the systematic review on process mining. Their task has been to provide summary of the current trends in process mining practice and highlight the need for the future research. The research has been focused on process mining, the problems within process mining and issues to be solved regarding automatization, methods and standardization. The systematic review on security in Process-Aware Information systems (PAIS) was performed by Leitner and Rinderle-Ma [5] in 2014. The objective was to investigate research on security in PAIS and to establish common understanding of terminology in this context. It investigates which security controls are currently applied in PAIS and utilized security controls [5]. In conclusion, the authors underline that they want to detect unauthorized access or misuse of permissions in RBAC models using process mining techniques

1.2 Information security

Information security defined by International Organization for Standardization [6] is the preservation of confidentiality, integrity and availability of information. Internal and external parties can use International Standard [7] to assess the organization's ability to meet the organization's own information security requirements.

It is essential that an organization identifies its security requirements. There are three main sources of security requirement [8]:

1. the assessment of risks to the organization, taking into account the organization's overall business strategy and objectives. Threats to assets are identified, vulnerability to and likelihood of occurrence is evaluated and potential impact is estimated through risk assessment;

2. the legal, statutory, regulatory and contractual requirements that an organization, its trading partners, contractors and service providers have to satisfy, and their socio-cultural environment;

3. the set of principles, objectives and business requirements for information handling, processing, storing, communicating and archiving that an organization has developed to support its operations.

When considering an enterprise information system, security plays a role at different levels, i.e., from the level of UNIX processes to the level of interorganizational business processes [9]. Security policies may refer to things ranging from cryptography and role-based access control to auditing and the four eyes principle. Security violations may be conducted by hackers but also by white-

collar criminals. Literature on security can be split into computer security and auditing [9]. Although computer security and auditing are at very different levels, the absence or presence of certain behavioural patterns may indicate security violations. Therefore, audit trails can be useful. Fortunately, many enterprise information systems store relevant events in some structured form [9].

An Information Security Management System (ISMS) is a systematic approach for establishing, implementing, operating, monitoring, reviewing, maintaining and improving an organization's information security to achieve business objectives [6]. It is based upon a risk assessment and the organization's risk acceptance levels designed to effectively treat and manage risks [6]. Information Security Management System (ISMS) involves the following essential components [10]: 1) Information security policies; 2) Organization of information security; 3) Human resource security; 4) Asset management, 5) Access control; 6) Cryptography; 7) Physical and environmental security; 8) Operations security; 9) Communications security; 10) System acquisition, development and maintenance; 11) Supplier relationships; 12) Information security incident management; 13) Information security aspects of business continuity management; 14) Compliance.

Therefore, in this research the security will imply the usage of any of above mentioned terms defined in [6].

1.3 Contribution

This paper provides a systematic literature review [11] on process mining techniques adopted in the security domain with special emphasis on public sector implementations. To achieve this goal the following research questions are formulated:

A. What are the prevailing topics in research papers on the process mining usage in security?

B. What are the main challenges of process mining usage in security domain?

C. What are the main possibilities for future work or identified research areas?

The rest of the paper is structured as follows: the research methodology is described in Section 2, the main explanation of research results is presented in Section 3 and finally, concluding remarks in Section 4.

2. Research methodology

To gain insight on process mining implemented in the security domain a literature review has been conducted according to the general systematic review steps proposed by Kitchenham [11]. The most common reasons for undertaking a systematic review are [11]: 1) to summarise the existing evidence concerning treatment or technology e.g. to summarise the empirical evidence of the benefits and limitations of a specific agile method; 2) to identify any gaps in current research in order to suggest areas for further investigation; 3) To provide a framework/background in order to appropriately position new research activities.

2.1 Literature search

The first step in literature research was to define the keywords which will be used in database search. The first keyword was "process mining" and the second "security" as the general term which

includes all the essential components. The content analysis method has been used for the paper analysis and establishing categories and then counting instances that fall into each category [12]. Consequently, the database query is as follows: "process mining" AND "security".

The second step was to define the relevant databases to perform search: 1) Web of Science; 2) Computer Science Bibliography – DBLP; 3) Science Direct; 4) IEEE Computer Society; 5) ACM; 6) Springer; 7) Google Scholar.

For all the databases, the search query was limited to: proceedings papers and articles, timespan from 2000 -2016, and categories: Computer science information systems, Computer Science theory methods.

The inclusion and exclusion criteria for article selection are presented in Table 1. Based on these criteria all the articles have been selected. The whole research has been conducted in three phases. The first phase objective has been to rise queries in databases with defined keywords and titles and keywords analysis. The articles matching the criteria have been selected. The second phase has taken into consideration the abstracts and duplicates. If the paper has matched criteria, the third phase has been performed – the full text analysis. The papers that have not matched the criteria have also been excluded from the research.

	PHASE 1	**PHASE 2**	**PHASE 3**
INCLUSION CRITERIA	Title indicates that the paper is about the process mining and security Keywords indicate that the paper is about the process mining and security	Abstract of articles indicates that the paper is about the process mining and security	Topics on the process mining usage in security examples of implementation in the public sector The main challenges of process mining usage in security domain The main possibilities of future work or identified research areas
EXCLUSION CRITERIA	Title indicates that the paper is about another topic, it can include process mining but without security Keywords indicate that the paper is about another topic Book Chapter PhD or Master Thesis	Abstract of articles indicates that the paper is not related to the topic No abstract available Duplicates excluded	There are no process mining techniques related to the security There are no security issues covered

Table 1: Paper inclusion and exclusion criteria

An initial search was performed during November 2016 and the initial number of 393 papers were discovered. The results of the first phase – rising queries with keywords in databases are presented in Table 2.

	DATA SOURCE	**NO. PAPERS**
1	Web Of Science	14
2	DBLP	4
3	Science Direct	151
4	IEEE Computer Society	22
5	ACM	7
6	Springer	72
7	Google Scholar	126
	TOTAL	**393**

Table 2: First phase – rising queries with keywords in databases

The second selection was based on the analysis of the abstracts and removing duplicates. After the second phase 60 articles remained. The third selection was performed by full text analysis and final number of papers ready for analysis was 40. The results are presented in table 3.

	DATA SOURCE	NO. PAPERS-1ST PHASE RESULTS	NO. PAPERS-2ND PHASE RESULTS	NO. PAPERS - 3RD PHASE RESULTS
1	Web Of Science	14	4	1
2	DBLP	4	0	0
3	Science Direct	151	9	5
4	IEEE Computer Society	22	8	7
5	ACM	7	2	0
6	Springer	72	2	2
7	Google Scholar	126	35	25
	TOTAL	**393**	**60**	**40**

Table 3: The number of papers according to phases

3. Research Results

The analysis of 40 identified articles has shown that in time span 2000 - 2016 the number of articles relating to process mining and security has been rising since 2012. – Table 4.

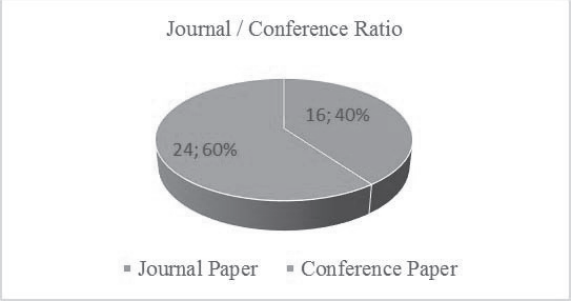

Figure 1: Journal/conference ratio

Figure 1 presents the ratio of the papers published for conferences (60%) to the papers published in journals (40%).

YEAR	NO. PAPERS
2004	1
2005	1
2008	4
2009	2
2010	1
2011	3
2012	6
2013	6
2014	5
2015	4
2016	7
TOTAL	**40**

Table 4: The number of papers per year

Table 5 shows the Journals and the number of papers published in them according to the criteria of this research. It is very interesting that 24% of all the papers have been published in a really acknowledged journal - Information Systems journal, whose Impact factor is 1.832.

JOURNAL	NO. PAPERS	IF	5 YR IF	SNIP	SJR
Information Systems	4	1.832	2.105	3.111	1.202
International Journal of Business Process Integration and Management	2	-	-	-	-
Computers & Security	1	1.640	1.783	2.563	1.020
Computing	1	0.872	1.144	0.956	0.440
Decision Support Systems	1	2.604	3.271	2,271	2.262
EURASIP Journal on Information Security	1	-	-	-	0.295
Expert systems with applications	1	2.981	2.879	2.561	1.839
Information and Software Technology	1	1.569	2.016	3.163	0.920
International Journal of Communication Networks and Information Security (IJCNIS)	1	-	-	-	-
International Journal of Computer, Electrical, Automation, Control and Information Engineering	1	-	-	-	-
Journal IDA	1	0.631	-	-	-
Journal of Information and Data Management	1	-	-	-	-
TOTAL	**16**				

Table 5: The number of papers per journal

The most popular conferences to publish research papers in the scope of this particular research are: ACM symposium on Applied computing, Business Process Management Workshops, IEEE Conference on Communications and Network Security (CNS), International Carnahan Conference on Security Technology (ICCST) with two published papers. The list of conferences with number of published papers is presented in Table 6.

1) In the *Conformance checking* category, the three main development areas can be identified: different approaches to conformance checking, proposing new frameworks and algorithms and visualization. An approach to check if the data recorded in the event logs of a process aware information systems (PAIS) conforms to the corresponding process-related Role-based access control (RBAC) model is presented [20]. The process-related RBAC models are automatically transformed to corresponding Linear Temporal Logic (LTL) rules which are used to check the event logs for violations of the policies that are defined via the RBAC model [20]. The results of this conformance check can serve as basis for security and domain experts to detect violations [20]. In future work, authors plan to integrate presented work into related approaches for analysing the control flow [20].

VENUES	NO. PAPERS
ACM symposium on Applied computing	2
Business Process Management Workshops	2
IEEE Conference on Communications and Network Security (CNS)	2
International Carnahan Conference on Security Technology (ICCST)	2
Advances on P2P, Parallel, Grid, Cloud and Internet Computing	1
Asia-Pacific Software Engineering Conference (APSEC)	1
CEUR Workshop Proceedings	1
Intelligence and Security Informatics	1
International Conference of the Chilean Computer Science Society (SCCC)	1
International Conference on Computer, Control, Informatics and its Applications (IC3INA)	1
International Conference on Enterprise Information Systems	1
International Conference on Information and Communication Technology (ICoICT)	1
International ISC Conference on Information Security and Cryptology (ISCISC)	1
International Symposium on Intelligent Systems and Informatics (SISY)	1
International Workshop on Business Process Modelling, Development and Support/14th Conference on Exploring Modelling Methods for Systems Analysis and Design	1
International Workshop on Database and Expert Systems Application	1
International Workshop on Security Issues with Petri Nets and other Computational Models (WISP 2004)	1
Management Intelligent Systems	1
On the Move to Meaningful Internet Systems: OTM 2011	1
Simposio Brasileiro de Sistemas de Informaçao	1
TOTAL	**24**

Table 6: The number of papers per conference

A novel technique to identify potential causes of failures in business processes based on event logs has been proposed [29]. Four types of causes can be identified and missing or unnecessary activities and behavioural patterns that differ from each other in the control flow or the time perspective can be found [29]. An approach to categorize deviations, which enables auditors to quickly gain an overview of different types of existing deviations along with their frequencies is proposed [33]. Categorizing deviating process instances can also give an insight for assessing the risk at case level [33]. An application of process mining for the financial audit has been presented in [34]. The conformance analysis can be used as an audit technique in the execution of the financial audit [34]. Using a generalized and simplified process model of an organisation's procurement process, and the event log of SAP R/3, a number of deviating process instances and fitting classes of transactions have been detected [34]. The paper Enhancing Mobile Device Security with Process Mining [43] presents a research project which uses mining of processes found in mobile device activity logs and analysis of those processes. The authors report on the lack of quality data in the area of simulated attacks. The target platform - Android - lacks capabilities required for gathering of more detailed data about processes [43]. The advantage of such process mining is its ability to perform heuristic analysis and to detect multi-channel attacks, which are difficult to catch using traditional methods. Process mining can be used to detect not only actual attacks, but also any other behaviour which could cause harm [43]. If the analysis of activity logs can be performed off-site but in near real time, it can also cover a large number of known models of harmful activity. Performed in the mobile device itself, the performance barrier of these devices is soon met [43]. An approach and a

supporting tool for the evaluation of the overall process risk and the prediction of process outcomes based on the analysis of information recorded in event logs has been presented [48]. It can help managers evaluate the overall risk exposure of their business processes, track the evolution of overall process risk, identify changes and predict process outcomes based on the current value of overall process risk [48]. Development of new techniques for both measuring and visualizing non-conformance and the support for further modelling languages is needed [48].

A framework which structures the field of process deviation analysis and a general outline to detect high-level process deviations has been formulated [23]. The change of patterns in PAIS provides an interesting starting point for future research [23]. A Proces Aware Host-based Intrusion Detection (PAHID) model has been introduced [25]. The model uses both anomaly detection and misuse detection techniques to provide more efficiency. Organizational perspective is considered to detect more attacks. The model is automated and flexible and can deal with large logs. In future works case perspective should also be considered to provide more accuracy and to perform an evaluation on a set of real log [25]. A methodology and infrastructure for securing and validating inter-organizational business processes with high-throughput at run time is presented [27]. The method uses process mining techniques and can be used to validate and enforce security rules as well as contractual and legal requirements and is specifically adapted to distributed processes [27]. It can be used to rollback multi-step, multi-party transactions after an anomaly is detected [27]. It has been implemented for the distributed issuing infrastructure of electronic identity cards in Italy [27]. The traditional deviation detection approaches have problems in situations where event logs contain a variety of process behaviour [35]. A novel algorithm named cyclic SC which is faster than cluster-based approaches and more accurate than model-based approaches has been proposed [35]. The framework is configurable and it is used to create a concrete approach for detecting deviations from control-flow perspective [35]. A novel conformance algorithm that balances the deviations with respect to all perspectives (control-flow Data dependencies, resource assignments and time constraints) based on a customizable cost function has been proposed [36]. Some of the future work possibilities are investigating the nature and effects of different cost functions, looking at the specific alignments to dig into specific deviations at the case level, improving the visualization so that it is easier to explore a large set of alignments. In process security checking, the conformance of a case depends on the behaviour observed in other cases that are being executed [36].

A novel approach for visualizing database intrusion detection using process mining techniques modelling low-level event logs has been proposed [19]. The visualization will be able to help security officers who might not know deeply the complex system, identify the true positive detection and eliminate the false positive results [19]. One of our future research courses might be to investigate heuristics to embed them in this algorithm for the intrusion detection purpose [19].

2) The papers in the *Anomaly detection* category can be logically divided in following areas: algorithms, models and implementations. It is argued that both aspects (discovery and delta analysis) are relevant for computer security and auditing [9]. In the context of security, the concept of process mining and the α-algorithm is examined to discover a process that describes all possible behaviours [9]. The α-algorithm discovers a net that models all acceptable behaviour whenever the complete log given as input has only acceptable audit trails and the discovered net is a sound WF-net [9]. Once the net is discovered, the conformance of every new audit trail can be verified by playing the "token game". The anomalous audit trails do not correspond to possible firing sequences in the "token game" for the discovered net [9]. The "token game" detects the point in which the audit trail diverges from the normal behaviour and also allows the real time verification of trails [9]. The challenges Detecting Anomalous Process Execution and Checking Process Conformance are

highlighted. The authors predict that organizations will increasingly need to store and monitor audit trails in order to detect intrusion on low level and fraud detection on high-level security. The report on ways to automate and control business processes, and also to track misuse of their systems has been presented [15]. The control provided by normative systems may compromise the necessary flexibility to companies. The approach to identify anomalous traces, which may represent a misuse, has also been presented. The ProM framework has been described and a real application of approach has been carried out with a real log from Dutch municipality [15]. Since the presented anomaly detection approach is limited to the control-flow perspective, the data and organizational perspectives should also be considered to provide more accuracy [15]. The automated solution might be implemented using genetic algorithms as well. The research gap has been reported in anomaly detection area in the context of PAIS [16]. The two different approaches for detecting anomalous traces in a log using an algorithm based on Sampling and an algorithm based on Threshold has been presented. The research can be resumed on the assessment of other process mining algorithms and the development of other "noise" metric [16]. More detailed research regarding anomaly detection methods and assessment of algorithms has been presented [18]. Four algorithms for detecting anomalies in logs of PAIS are discussed [21]. One of the algorithms only marks as potential anomalies traces that are frequent in the log, the other three algorithms: threshold, iterative and sampling are based on mining a process model from the log, or a subset of it [21]. The research was limited because only the control-flow perspective has been adopted thus its approach is incomplete [21]. An anomaly detection algorithm for logs of PAIS based on four different metrics: fitness, structural appropriateness, behavioural appropriateness, and size has been proposed [24]. Such an algorithm is important in application scenarios where a flexible and secure business process is essential [24]. The anomaly detection algorithm was based on the process mining α-algorithm. It is important to note that the accuracy of algorithms is strictly related to the following components: (i) the process mining algorithm; (ii) the metric used to evaluate the compliance variance between two logs (with and without anomalous traces); and (iii) the threshold value used to define the compliance variance limit for logs without anomalous traces [24]. The future research should consider the assessment of other process mining algorithms (e. g. α – algorithm extensions), other metrics, and a deeper study of threshold values [24]. A Dynamic Threshold Algorithm for anomaly detection of traces in PAS logs is presented in order to provide a solution to balance the trade-off between flexibility and security [28]. This paper emphasises anomalies as frauds. This algorithm has a statistically significant better accuracy for both dataset of logs against the algorithms proposed in [21]. The proposal for the future work is to combine the results of Sampling and Dynamic Threshold Algorithms into a single decision [28].

In [26] a genetic-based anomaly detection model for logs of PAIS has been presented. This model is appropriate for all application domains to provide a trade-off between flexibility and security [26]. The proposed anomaly detection approach is concerned with the control-flow perspective [26]. Therefore, in the future, data and organizational perspectives will be considered to provide more accuracy [26]. An effective Business Process Mining Based Insider Threat Detection system has been introduced [30]. The system uses genetic mining method to discover the control-flow model of the business process. On that basis, the system further mines the tree-structured operator's behaviour profile. Additionally, it also gets the normal data about performance on specific events through statistical method and expert knowledge [30]. Possible abnormal behaviours that a malicious operator may perform when conducting an insider attack are analysed, as well as the influences of these behaviours on business activities [30].

A research to study the DNS traces using process mining instead of traditional statistical approach has been presented [39]. One distinctive feature is the representation of type of each message as a

node; this is different from the usual way of representing the data where each host is a node and the messages are represented as edges. This data representation could also be applied to other types of data workflows, such as HTTP and SSH negotiation [39]. This could give a new insights into how much implementations differ from the standards, as well as into discovering or detecting different types of attacks [39]. It is planned to study how this graph representation of DNS traces can be analysed by process mining and other technologies to discover new patterns and behaviours that are hard to identify otherwise: Different types of attacks may lead to different types of graphs [39]. Obtaining this information in real time or near real time could provide more information to take specific countermeasures to avoid the attack, whether by automatic or manual systems [39]. Similar to [39], an approach in using Passive Testing (used in protocol and software conformance checking) and Process Mining (used in enterprise workflow analysis) techniques for analysing DNS operation traces has been presented [44]. This approach was applied over a Day in Internet Life DNS traces for showing how easily a mail bonnet attack can be discovered [44]. As future work, it is planned to compare the results obtained using PT/PM algorithms with other techniques such as passive/active testing and automating tools for checking the conformance of the protocols [44]. A paper on different usage of process mining techniques in order to present an application of process cube to software defect resolution process to analyse and compare process data from a multi-dimensional perspective is proposed [42]. Each process cube cell is defined by metrics from multiple process mining perspectives like control flow, time, conformance and organizational perspective [42]. The process cube with 9 dimensions: issue report timestamp, priority, state, closed status, OS, component, bug type, reporter and owner is defined [42]. OLAP cube operations: slice, dice, roll-up and drill-down, and create materialized sublog for each cell are applied [42].

3) The *Compliance control* category can be structured in following basic areas: the framework development, and automation with security. A process mining as a basis for various security audits of business process and corresponding business process management systems has been reported [13]. The process discovery has been evolved beyond original α-algorithm, and there are several process discovery methods used depending on the focus of the analysis [13]. The three drawbacks are reported [13]: 1) a lack of tools capable of analysing the structures produced by process discovery algorithms, so that it is largely manual; 2) support for several desirable structures relevant for security analysis can still not be drawn from event logs; 3) precision issues regarding the structures are still missing. This indicates some of the future research course regarding "security analytics" which in general is a powerful basis for risk analysis [13]. A compliance monitoring framework that tackles three major challenges: Identification and Monitoring of Individual Activations of a Compliance Rule, Proactive Prevention of Violations and Root Cause Identification in Case of Violations has been proposed [22]. The framework enables the identification of all activations of a compliance rule and enables to "initiate" a Compliance Rule Graph (CRG) each time a new activation is observed and thus to individually monitor the activations [22]. In the future, efficiency and further addressing the interplay of CRGs should be improved. A framework for context-based analysis of transaction data to validate and secure inter-organizational business processes have been proposed [40]. The analysis is based on process mining techniques and uses observations taken at all relevant communication layers which are combined with semantic analysis [40]. The presented context based analysis allows the simple implementation of complex security and compliance policies [40]. A framework for Compliance Monitoring Functionalities (CMF) that enables the systematic comparison of existing and new approaches for monitoring compliance rules over business processes during runtime has been defined [46]. The framework consists of ten Compliance Monitoring Functionalities (CMFs) and includes requirements for the constraint modelling notation, requirements with respect to the execution and user requirements [46]. The work can be further extended in several directions, e.g., to cross-

organizational or configurable processes [46]. An incremental approach to check the conformance of a process model and an event log has been proposed [47]. The fitness between the log and the model is measured and the appropriateness of the model can be analysed with respect to the log [47]. Appropriateness can be evaluated from both a structural and a behavioural perspective [47]. To operationalize the ideas a Conformance Checker has been implemented within the ProM framework, and it has been evaluated using artificial and real-life event logs [47]. Future work will aim at the development of new techniques for both measuring and visualizing non-conformance, and at the support of further modelling languages.

A novel system for the provision of efficient operational support for distributed and security sensitive business processes in which automated process validation and extensive troubleshooting functionality is closely integrated with IT Service Desk (SD) operations has been presented [41]. That system's capabilities enable the efficient and automated detection and resolution of anomalies in distributed business processes [41]. The system improves Service Desk (SD) performance and increases process security through real time compliance checking [41]. The system further reduces security risks associated with SD operations and SD staff-user interactions including social engineering attacks as it allows SD staff to cross-reference user provided information with system reports [41].

4) In the *Fraud detection* category the identified papers describe the new detection methods of Process-based Fraud (PBF) and implementations. Process mining implementation in the context of transaction fraud detection has been presented in [17]. Although tools are available, they are still quite under-developed and there is need to enhance tools like ProM to better automate the audit process and to visualize results for management [17]. The ontology-based process modelling to model and capture the business process anomalies and the method of multi-level class association rule learning (ML-CARL) to detect fraud in business process has been proposed [31]. A New Method for Occupational Fraud Detection in Process Aware Information Systems is proposed [32]. In this approach, a process model is mined and its structures specified, a numerical vector for each process instance using the structures is built and then outliers in the vectors using statistical information specified [32]. These outliers are suspected of frauds. The method is focused solely on the sequence of activities. To improve the method, some other process mining algorithms, real logs time of activity execution and unauthorized performers should be performed [32]. Ahmad and Sarno have indicated that none of the several earlier proposed detection methods of Process-based Fraud (PBF) presents identification of PBF attributes and pattern clearly [38]. In order to detect PBF a PBF table pattern is required with a set of PBF attributes which are proposed in research [38]. Some future work should focus on designing a more effective pattern of PBF with domain expert [38]. A comprehensive rule-based compliance checking approach as a possible solution to eliminate the limited fit has been proposed [45]. The approach enables analysts to uncover compliance failures as well as to identify and assess potential risks [45]. The major opportunities in the research area are: effectiveness, persuasive evidence and audit independence, assumption (data quality) [45]. Improvements can be found in the ability to take additional data into account, the reduction of possible distortions (including over specification) and no need for generalization [45]. The identified challenges are: distortions in interpretation and pattern design and continuous monitoring/auditing [45]. A logical future step is to further test this approach and to tackle the identified challenges focusing on the development of a continuous monitoring/auditing approach based on process mining techniques [45].

5) In the *Risk management* category, the following areas have been identified. The first area is to propose a comprehensive process mining applicability framework that provides a clear guidance as

well as a common language for business process mining in the context of enterprise risk management and a broader governance, risk and compliance (GRC) setting [49]. The applicability framework consists of three interrelated dimensions: (i) Process Mining Techniques Dimension (Process Discovery & Visualization, Conformance Checking & Delta Analysis and Rule-Based Property Verification); (ii) Control Functions Dimension; (iii) Control Function Activities Dimension: Discusses the potential application areas of process mining for GRC activities: Risk Identification & Assessment, Control Activities and Information, Documentation & Communication [49]. The second area is more theoretical: to provide an overview of scientific research efforts regarding the integration of security and risk considerations into business process management [14] and to provide a review of existing literature in financial fraud detection and compare their findings [50]. Some challenges [14] were identified: 1) Consideration of different impact perspectives; 2) Occurrence probabilities; 3) Extension of security/dependability attributes (availability, confidentiality, integrity, accountability, safety, etc.); 4) Efficient resource allocation taking security aspects into account; 5) Improvements on the current business process notations to facilitate risk/security evaluation; 6) Providing metrics on the security robustness of business processes.

6) In the *Access Management* category the authors reports that hardly any supportive means for the automated detection and refinement as well as management of identity and access management (IAM) policies are available [37]. A dynamic policy management process (DPMP) which structures the activities required for policy management in identity and access management environments into four phases [37] has been proposed. It facilitates a mining engine which generates policy recommendations based on contextual data of employees and further presents gathered results to human IAM engineers [37]. For future work, it is planned to extend the DPMP in order to improve the representation and management of policy recommendations and provide an analysis of policy interdependencies [37].

7) The first *systematic literature review* on security in PAIS [5] have taken into the consideration different aspects of security in PAIS. In the future work, they aim at working towards closing the gap between security research in Information Systems and PAIS, to concentrate on some of the open issues outlined in the paper such as the development of detection and reaction controls and to investigate the evaluation of inter-instance constraints with mining techniques [5].

4. Conclusion

In this research 393 papers have been proven to fulfil the criteria claiming that process mining techniques must be implemented in the field of security with special emphasis on implementation in public domain. The systematic review method has been chosen and in three iterations based on clearly defined criteria 40 papers have been selected. At first sight, it was concerning that the total number of 40 papers is not impressive in such a field, but with ongoing research the systematic review paper [5] has been discovered where authors have underlined that some future work should further explore the process mining as the next big topic. That finding has confirmed the right course of this research which is combining process mining with security and has also revealed that there could be some room for further investigations.

At the beginning of the research three research questions have been formulated:

A. What are the prevailing topics in research papers on the process mining usage in security?

B. What are the main challenges of process mining usage in security domain?

C. What are the main possibilities for future work or identified research areas?

The answer to the first research question has been given using the content analysis. In selected papers 6 security categories have been identified: conformance checking; anomaly detection; compliance control; fraud detection; risk management; access management. The most popular security categories are Conformance checking which has been analysed in the 30% of all the published papers and the Anomaly detection with 30% of all published papers. The complete list of the prevailing topics in research papers on the process mining usage in security is presented in Table 7.

No.	SECURITY CATEGORY	NO. PAPERS
1	Conformance checking [19], [20], [23], [25], [27], [29], [33], [34], [35], [36], [43], [48]	12
2	Anomaly detection [9], [15], [16], [18], [21], [24], [26], [28], [30], [39], [42], [44]	12
3	Compliance control [13], [22], [40], [41], [46], [47]	6
4	Fraud detection [17], [31], [32], [38], [45]	5
5	Risk management [14], [49], [50]	3
6	Access management [37]	1
7	Systematic review [5]	1
	TOTAL	**40**

Table 7: The number of papers per Security Category

The second research question has dealt with the main challenges of process mining usage in security domain. The answer to this question has been provided in the text analysis of selected papers where it was possible to extract this information.

The challenges Detecting Anomalous Process Execution and Checking Process Conformance have been highlighted. Some research has been incomplete because only one perspective has been adopted in the research.

The lack of tools capable of analysing the structures produced by process discovery algorithms has been pointed out. Support for several desirable structures relevant for security analysis (e.g. such as process structures with data and role hierarchies) could still not be drawn from event logs. Precision issues regarding the structures are, for the most approaches, still missing. Extension of security/dependability attributes (availability, confidentiality, integrity, accountability, safety, etc.) is needed. Efficient resource allocation taking security aspects into account is necessary. Improvements on the current business process notations to facilitate risk/security evaluation should be undertaken. Providing metrics on the security robustness of business processes is necessary.

In the paper Intelligent financial fraud detection: A comprehensive review [45] of some of the key issues associated with financial fraud detection and suggested areas for future research are presented as follows:

- Typical classification problems: CI and data mining-based financial fraud detection is subject to the same issues as other classification problems, such as feature selection, parameter tuning, and analysis of the problem domain.

- Fraud types and detection methods: Financial fraud is a diverse field and there has been a large imbalance in both fraud types and detection methods studied: some have been studied extensively while others, such as hybrid methods, have only been looked at superficially.

- Privacy considerations: Financial fraud is a sensitive topic and stakeholders are reluctant to share information on the subject. This has led to experimental issues such as under sampling.

- Computational performance: As a high-cost problem it is desirable for financial fraud to be detected immediately. Very little research has been conducted on the computational performance of fraud detection methods for use in real-time situations.

- Evolving problem: Fraudsters are continually modifying their techniques to remain undetected. As such detection methods are required to be able to constantly adapt to new fraud techniques. Disproportionate misclassification costs: Fraud detection is primarily a classification problem with a vast difference in misclassification costs. Research on the performance of detection methods with respect to this factor is an area which needs further attention.

- Generic framework: Given that there are many varieties of fraud, a generic framework which can be applied to multiple fraud categories would be valuable.

The third research question has investigated which are the main possibilities of future work or identified research areas?

The authors predict that organizations will increasingly need to store and monitor audit trails in order to detect intrusion on low level and fraud detection on high-level security. Since the presented anomaly detection approach is limited to the control-flow perspective, the data and organizational perspectives should also be considered to provide more accuracy. One of the future work proposals is to combine the results of Sampling and Dynamic Threshold Algorithms into a single decision for anomaly detection in PAS logs [28].

Bustos-Jimnez et al. suggests further research in process mining and other technologies in order to analyse graph representation of DNS traces to discover new patterns and behaviours that are hard to identify otherwise: Different types of attacks may lead to different types of graphs [39]. Obtaining this information in real time or near real time could provide more information to take specific countermeasures to avoid the attack, whether by automatic or manual systems [39].

Process mining has been used as a basis for various security audits of business process and corresponding business process management systems. However, there is a lack of tools capable of analysing the structures produced by process discovery algorithms, so that it is largely manual [13]. Secondly, support for several desirable structures relevant for security analysis [13]. Thirdly, precision issues regarding the structures are, for the most approaches, still missing [13].

Although tools for fraud detection are available, they are still quite unreliable and such tools like ProM should be enhanced in order to better automate the audit process and to visualize results for management. Some authors suggest that the future research should consider the assessment of other process mining algorithms (e. g.: extensions of α -algorithm), other metrics, and a deeper study of threshold values. Some future work should be directed towards designing a more effective pattern of PBF with domain expert.

Possible future research directions are: investigating the nature and effects of different cost functions, looking at the specific alignments to dig into specific deviations at the case level, improving the visualization so that it is easier to explore a large set of alignments.

The development of new techniques for both measuring and visualizing non-conformance with the support of further modelling languages are needed.

Regarding implementation of process mining in public sector, only two papers have explicitly stated that real application has been carried out. The first identified paper was Anomaly Detection Using Process Mining [15]. The ProM framework has been described and a real application of approach has been carried out with a real log from Dutch municipality [15], the second paper was Balanced multi-perspective checking of process conformance [36] where the process mining algorithm is used in management of road traffic fines.

5. References

[1] VAN DER ALST, W. M. P.: *Process Mining - Discovery, Conformance and Enhancement of Business Processes*. Berlin: Springer-Verlag Berlin Heidelberg, 2011.

[2] VAN DER AALST, W. *et al.,*: Process Mining Manifesto, in *Business Process Management Workshops*, vol. 99, F. Daniel, K. Barkaoui, and S. Dustdar, Eds. Berlin, Heidelberg: Springer Berlin Heidelberg, 2012, pp. 169–194.

[3] VAN DER AALST, W. M. P. and DUSTDAR, S.: Process Mining Put into Context, *IEEE Internet Comput.*, vol. 16, no. 1, pp. 82–86, Jan. 2012.

[4] TIWARI, A. TURNER, C. J. and MAJEED, B.: A review of business process mining: state-of-the-art and future trends, *Bus. Process Manag. J.*, vol. 14, no. 1, pp. 5–22, Feb. 2008.

[5] LEITNER, M. and RINDERLE-MA, S.: A systematic review on security in Process-Aware Information Systems – Constitution, challenges, and future directions, *Inf. Softw. Technol.*, vol. 56, no. 3, pp. 273–293, Mar. 2014.

[6] Information technology — Security techniques — Information security management systems — Overview and vocabulary, ISO/IEC 27000:2014. International Organization for Standardization, 2014.

[7] Information technology – Security techniques – Information security management systems – Requirements (ISO/IEC 27001:2013). International Organization for Standardization, 2013.

[8] Information technology – Security techniques – Code of practice for information security controls (ISO/IEC 27002:2013+Cor 1:2014). International Organization for Standardization, 2014.

[9] VAN DER AALST, W. M. P. and DE MEDEIROS, A. K. A.: Process Mining and Security: Detecting Anomalous Process Executions and Checking Process Conformance, *Electron. Notes Theor. Comput. Sci.*, vol. 121, pp. 3–21, Feb. 2005.

[10] BSI-Standard 100-1, Information Security Management Systems (ISMS). Bundesamt für Sicherheit in der Informationstechnik (BSI), Godesberger Allee 185 -189, 53175 Bonn, 2008.

[11] KITCHENHAM, B.: Procedures for performing systematic reviews, *Keele UK Keele Univ.*, vol. 33, p. 2004, 2004.

[12] SILVERMAN, D., *Interpreting Qualitative Data*, 5th ed. Los Angeles: SAGE.

[13] ACCORSI, R., STOCKER, T. and MÜLLER, G.: On the Exploitation of Process Mining for Security Audits: The Process Discovery Case, in *Proceedings of the 28th Annual ACM Symposium on Applied Computing*, New York, NY, USA, 2013, pp. 1462–1468.

[14] JAKOUBI, S., TJOA, S., GOLUCH, G. and QUIRCHMAYR, G.: A Survey of Scientific Approaches Considering the Integration of Security and Risk Aspects into Business Process Management, 2009, pp. 127–132.

[15] BEZERRA, F., WAINER, J. and VAN DER AALST, W. M. P.: Anomaly Detection Using Process Mining, in *Enterprise, Business-Process and Information Systems Modeling*, vol. 29, T. Halpin, J. Krogstie, S. Nurcan, E. Proper, R. Schmidt, P. Soffer, and R. Ukor, Eds. Berlin, Heidelberg: Springer Berlin Heidelberg, 2009, pp. 149–161.

[16] BEZERRA, F. and WAINER, J.: Anomaly detection algorithms in logs of process aware systems, 2008, p. 951.

[17] JANS, M., VAN DER WERF, J. M., LYBAERT, N. and VANHOOF, K.: A business process mining application for internal transaction fraud mitigation, *Expert Syst. Appl.*, vol. 38, no. 10, pp. 13351–13359, Sep. 2011.

[18] BEZERRA, F. and WAINER J.: Anomaly Detection Algorithms in Business Process Logs, in *Proceedings of the Tenth International Conference on Enterprise Information Systems,* Barcelona, 2008, vol. AIDSS.

[19] HUYNH, V. H. and LE, A. N. T.: Process Mining and Security: Visualization in Database Intrusion Detection, in *Intelligence and Security Informatics*, vol. 7299, M. Chau, G. A. Wang, W. T. Yue, and H. Chen, Eds. Berlin, Heidelberg: Springer Berlin Heidelberg, 2012, pp. 81–95.

[20] BAUMGRASS, A., BAIER, T., MENDLING J. and STREMBECK, M.: Conformance Checking of RBAC Policies in Process-Aware Information Systems, in *Business Process*

Management Workshops, vol. 100, F. Daniel, K. Barkaoui, and S. Dustdar, Eds. Berlin, Heidelberg: Springer Berlin Heidelberg, 2012, pp. 435–446.

[21] BEZERRA, F. and WAINER, J.: Algorithms for anomaly detection of traces in logs of process aware information systems, *Inf. Syst.*, vol. 38, no. 1, pp. 33–44, Mar. 2013.

[22] LY, L. T., RINDERLE-MA, S., KNUPLESCH, D. and DADAM, P.: Monitoring Business Process Compliance Using Compliance Rule Graphs, in *On the Move to Meaningful Internet Systems: OTM 2011*, vol. 7044, R. Meersman, T. Dillon, P. Herrero, A. Kumar, M. Reichert, L. Qing, B.-C. Ooi, E. Damiani, D. C. Schmidt, J. White, M. Hauswirth, P. Hitzler, and M. Mohania, Eds. Berlin, Heidelberg: Springer Berlin Heidelberg, 2011, pp. 82–99.

[23] DEPAIRE B., SWINNEN J., JANS M. and VANHOOF, K.: A Process Deviation Analysis Framework, in *Business Process Management Workshops*, vol. 132, M. La Rosa and P. Soffer, Eds. Berlin, Heidelberg: Springer Berlin Heidelberg, 2013, pp. 701–706.

[24] BEZERRA, F. and WAINER, J.: Fraud detection in process aware systems, 2008, p. 254.

[25] JALALI, H. and BARAANI, A.: Process Aware Host-based Intrusion Detection Model, *Int. J. Commun. Netw. Inf. Secur. IJCNIS*, vol. 4, no. 2, Aug. 2012.

[26] JALALI, H. and BARAANI, A.: Genetic-based anomaly detection in logs of process aware systems, *Int. J. Comput. Electr. Autom. Control Inf. Eng.*, vol. 4, no. 4, pp. 692–697, 2010.

[27] TALAMO, M., ARCIERI F., SCHUNCK, C. H. and D'IDDIO, A. C.: Conformance checking of electronic business processes to secure distributed transactions, 2013, pp. 1–6.

[28] BEZERRA, F. and WAINER, J.: A Dynamic Threshold Algorithm for Anomaly Detection in Logs of Process Aware Systems, *J. Inf. Data Manag.*, vol. 3, no. 3, Sep. 2012, p. 316.

[29] CALDERÓN-RUIZ, G. and SEPÚLVEDA, M.: Automatic discovery of failures in business processes using Process Mining techniques, in *Proceedings of the IX Simposio Brasileño de Sistemas de Información*, Joao Pessoa, Brasil, vol. 1, 2013, pp. 439–450.

[30] ZHU T., GUO Y., MA J. and JU A.: Business Process Mining based Insider Threat Detection System, in *Advances on P2P, Parallel, Grid, Cloud and Internet Computing*, vol. 1, F. Xhafa, L. Barolli, and F. Amato, Eds. Cham: Springer International Publishing, 2017, pp. 467–478.

[31] SARNO, R. and SINAGA, F. P.: Business process anomaly detection using ontology-based process modelling and Multi-Level Class Association Rule Learning, 2015, pp. 12–17.

[32] MARDANI, S. and SHAHRIARI, H. R.: A new method for occupational fraud detection in process aware information systems, 2013, pp. 1–5.

[33] HOSSEINPOUR, M. and JANS, M.: Categorizing Identified Deviations for Auditing, in *Proceedings of the 6th International Symposium on Data-driven Process Discovery and Analysis (SIMPDA 2016)*, Graz, Austria, 2016, pp. 125–129.

[34] HAKVOORT, R. and SLUITER, A.: Process Mining: Conformance analysis from a financial audit perspective, *Int. J. Bus. Process Integr. Manag.*, vol. X, 2008.

[35] LI, G.: A Framework for Detecting Deviations in Complex Event Logs, *IDA*, 2016.

[36] MANNHARDT, F., DE LEONI, M., REIJERS, H. A. and VAN DER AALST, W. M. P.: Balanced multi-perspective checking of process conformance, *Computing*, vol. 98, no. 4, pp. 407–437, Apr. 2016.

[37] HUMMER, M., KUNZ, M., NETTER, M., FUCHS, L. and PERNUL, G.: Adaptive identity and access management—contextual data based policies, *EURASIP J. Inf. Secur.*, vol. 2016, no. 1, Dec. 2016.

[38] HUDA, S., AHMAD, T., SARNO, R. and SANTOSO, H. A.: Identification of process-based fraud patterns in credit application, 2014, pp. 84–89.

[39] BUSTOS-JIMENEZ, J., SAINT-PIERRE, C. and GRAVES, A.: Applying Process Mining Techniques to DNS Traces Analysis, 2014, pp. 12–16.

[40] TALAMO, M., ARCIERI, F., SCHUNCK, C. H. and D'IDDIO, A. C.: Providing context-based security for inter-organizational electronic business processes, 2013, pp. 393–394.

[41] TALAMO, M., POVILIONIS, A., ARCIERI, F. and SCHUNCK, C. H.: Providing online operational support for distributed, security sensitive electronic business processes, 2015, pp. 49–54.

[42] GUPTA, M. and SUREKA, A.: Process Cube for Software Defect Resolution, 2014, pp. 239–246.

[43] HLUCHY, L. and HABALA, O.: Enhancing mobile device security with process mining, 2016, pp. 181–184.

[44] SAINT-PIERRE C., CIFUENTES F. and BUSTOS-JIMENEZ J.: Detecting anomalies in DNS protocol traces via Passive Testing and Process Mining, 2014, pp. 520–521.

[45] WEST J. and BHATTACHARYA M.: Intelligent financial fraud detection: A comprehensive review, *Comput. Secur.*, vol. 57, Mar. 2016, pp. 47–66.

[46] CARON F., VANTHIENEN J. and BAESENS B.: Comprehensive rule-based compliance checking and risk management with process mining, *Decis. Support Syst.*, vol. 54, no. 3, Feb. 2013, pp. 1357–1369.

[47] LY, L. T., MAGGI, F. M., MONTALI, M., RINDERLE-MA, S. and VAN DER AALST, W. M. P.: Compliance monitoring in business processes: Functionalities, application, and tool-support, *Inf. Syst.*, vol. 54, Dec. 2015, pp. 209–234.

[48] ROZINAT, A. and VAN DER AALST, W. M. P.: Conformance checking of processes based on monitoring real behavior, *Inf. Syst.*, vol. 33, no. 1, Mar. 2008, pp. 64–95.

[49] PIKA, A., VAN DER AALST, W. M. P., WYNN, M. T., FIDGE, C. J. and TER HOFSTEDE, A. H. M.: Evaluating and predicting overall process risk using event logs, *Inf. Sci.*, vol. 352–353, Jul. 2016, pp. 98–120.

[50] CARON, F., VANTHIENEN, J. and BAESENS, B.: Rule-Based Business Process Mining: Applications for Management, in *Management Intelligent Systems*, vol. 171, J. Casillas, F. J. Martínez-López, and J. M. Corchado Rodríguez, Eds. Berlin, Heidelberg: Springer Berlin Heidelberg, 2012, pp. 273–282.

eGovernment and Society II

DISCUSSION ON INFORMATION SOCIETY BUILDING ISSUES PLATFORM – STUDY CASE "DISCUS" PROJECT, MOLDOVA

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Abstract
The DISCUSsion on Information Society Building Issues Platform (established within a project supported by the International Visegrad Fund in 2015) represents an excellent opportunity for relevant stakeholders from Moldova to approach the information society aspects, from the European model perspective and experience of V4 countries in the field. The platform allowed the communication among different actors involved in the information society development process and facilitated an effective experience exchange between Visegrad countries and Moldova. DISCUS is focused especially on local public authorities from Moldova that lag behind compared to the central level, in terms of electronic public services. Ranges of events were organized in Chisinau in order to bring together both local and central levels, plus other relevant sectors and with participation of V4 experts. Important aspects and good practices of e-government (at local level) were presented by V4 experts, development partners, government, central authorities and academia representatives. The Research Studies that followed each project event emphasize the achieved results, including relevant conclusions and recommendations, as well as research on issues that emerged during the discussions.

The article briefly presents the project impact with an accent on situational analysis, lessons learnt, good practices applicable for Moldova and the next steps.

1. Introduction

Republic of Moldova has embarked in the process of implementation the strategic goals aligned with Digital Agenda for Europe through national strategic documents on building information society such as "Digital Moldova 2020", "e-Transformation Agenda", "Enhancing competitiveness of ICT sector Strategy" which are contributing to achievement of the "Roadmap For Enhancement of Moldova's Competitiveness" tasks and finally to the implementation of the Moldova – European Union Association Agreement. [5]

The multiple issues should be overpassed in this process, including, but not limited to, how to keep the common vision of different actors under the main development direction, how to deal with the persistent resistance to change and to acceptance of e-Governance, e-services, ICT tools etc. Different, and sometimes contradictory, points of view of government, business, academia, civil society representatives on the issues and challenges in country transformation could hamper the pace of development and to lead to projects fail. A significant amount of assets and backlogs created and accumulated within the last years in Government institutions and beyond, may never be

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used. On the other hand, during the time, the proprietary software licenses purchased by different public authorities may come to their end of support by the producer. To identify assets and backlogs as well as emerging strategic issues in building e-Governance, a project was initiated - to build a special communication platform – a serial of permanent, regular, periodic seminars on information society development issues.

The DISCUSsion on Information Society Building Issues Platform was established within the project, with the same title, supported by the International Visegrad Fund in 2015 (12 months). The Information Society Development Institute (ISDI) from Moldova had the role of project applicant and coordinator. Three organisations from Slovakia, Poland and Czech Republic were project partners from Visegrad group (V4).

To achieve the project objective aiming at promoting the European model of effective application of information society policies/e-Governance tools in Moldova to strengthen participation of academic sector, local government, business, civil society, mass-media in decision making process, using the experience of V4 countries a range of activities and events have been undertaken.

The objectives of the project events: workshops and seminars were to inform and raise awareness among Moldovan local public servants, as well as different stakeholders regarding the information society development process, with an emphasis on the needs to develop and implement e-services at the local level. The purpose of the two study visits organized within the DISCUS project during 2015 was the exchange of experience, the transfer of best practices from Visegrad countries (Poland and Slovakia) to the Republic of Moldova, establishing contacts and fostering collaboration on Information Society field (focusing on local electronic services). [12]

The platform aimed to bring together international and local thought leaders, representatives of academic sector, Government, Business, Civil Society and mass media from Moldova and Visegrad countries. Each of 2 days seminar/workshop discussing the most actual and challenging issues ended with the agreed list of recommendations for relevant decision-making institutions.

2. Situational analysis in Moldova

In the Republic of Moldova, the main necessary regulatory framework was created for building information society. It currently includes more than 20 laws, 80 Government decisions; about 70 approved conceptual documents regarding the information systems of public authorities, more than 20 general-purpose regulatory acts and more than 75 with a specific purpose issued by the National Regulatory Agency for Electronic Communications and Information Technology (ANRCETI). [7] The relevant institutional framework is in place, which includes the Ministry of Information Technology and Communications, ANRCETI, National Radio Frequency Centre, Centre for Electronic Governance, National Centre for Personal Data Protection, etc.

Strategic Program for Governance Technological Modernization (e-Transformation), supported by the World Bank, was adopted in 2011. In 2013, the National Strategy “Digital Moldova 2020” [11] was approved by the Government and is being implemented. Recently, the Government approved a package of initiatives to increase the competitiveness of the IT industry: the Strategy for the years 2017-2021 and the Law on information technology industry parks, aimed at creating the necessary prerequisites for boosting development of the information technology industry oriented towards export.

The e-Governance Centre is the institution responsible on behalf of the Government for the implementation of the e-Transformation Agenda. The Centre is under the supervision of the Prime Minister and under the coordination of the National Commission for e-Transformation that formulate the strategic objectives and the e-Transformation priorities. The e-Governance Centre coordinates and directs the work of the e-Transformation Coordinators Council (established in 2011 by Government Decision; it is formed of representatives of ministries and central authorities). Council's mission is to ensure the implementation of e-transformation agenda across sectors and to coordinate the necessary processes for e-Transformation in public sector. [20]

The e-Governance Centre set up (in 2012) a unique platform for public services provided by the central authorities - www.servicii.gov.md portal. This platform functions as an electronic catalogue for public services provided by the authorities dedicated to citizens and the business. The main purpose of this platform is to offer brief, correct, accessible and complete information on the public services available in the Republic of Moldova. Currently, there are 548 available services on the portal, of which 125 are e-Services (on-line services) with data opened for access. [21]

The Republic of Moldova Government is determined to transform all traditional counter services into e-services by 2020, through the „Open Government action plan" and the „Government technological modernisation strategy" [20]. In this way, the citizens will be able to access over 500 e-services.

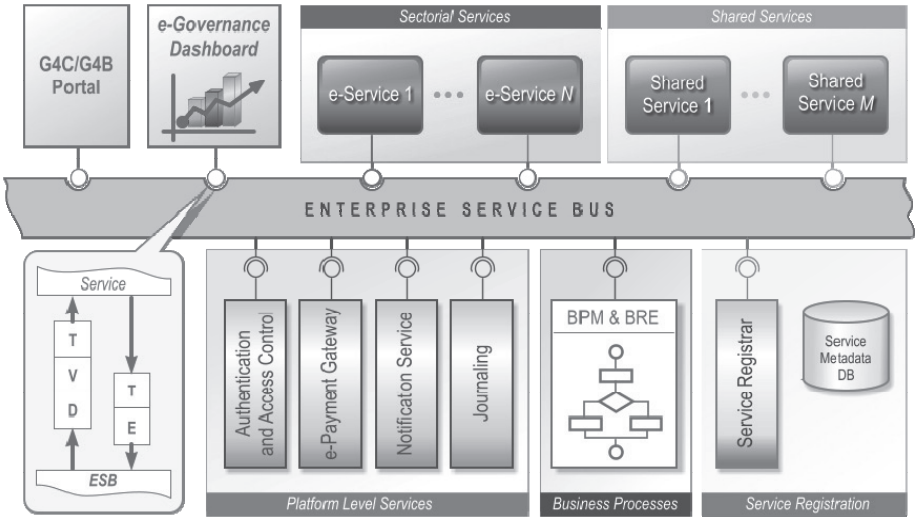

Figure 1: e-Government Platform [19]

Every year the "Citizens' perception, uptake and support for the e-Transformation of Governance in the Republic of Moldova" is being undertaking [2, 3]. The 2015 survey shows that citizens perceive e-Transformation of Government in Moldova as an important reform for society, as 79% of respondents said they support e-Transformation, which is an increase by 6% compared to the value reported in 2014 and by 21% compared to the data of the 2012 survey [1].

The share of citizens who needed and accessed public services provided by central public administration authorities in 2016 made up 31%, remaining at the same level (30% in 2015, 2014 and 2013), that demonstrates the need to additional analysis of such stagnation in uptake.

The level of satisfaction among online service users remained the same as in previous years and accounted for about 66% (fig. 2). More satisfied are young people aged 16-25 years, respondents from villages, Romanian speakers while less satisfied are people from cities, except for those from the capital (Chisinau) who have used the relevant services [2].

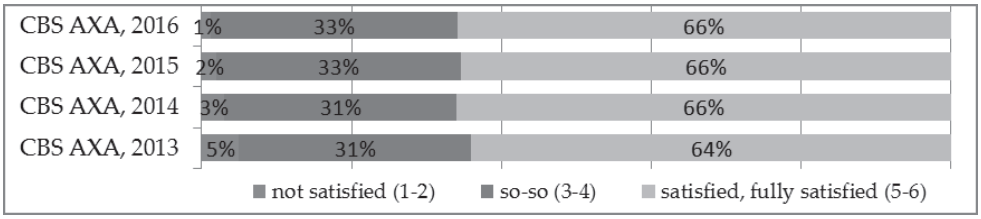

Figure 2: Level of satisfaction related to electronic services quality [2]

The main advantage of e-Government, reported by 29% of respondents, is that problems are resolved rapidly without queues. [1] Although the pace of growth of the level of access of government institution by population is significant in the last years, the level of e-Transformation agenda implementation is not yet at the satisfactory level. The level of knowledge by population of the e-Governance concept continues to be quite low in Moldova, with almost similar levels during the studied periods (2013-2016) [2]. A substantial gap exists between the level of accessed web pages of government institutions by population from the capital city - Chisinau, and citizens from urban areas and those who live in rural areas (fig. 3). These differences in accessing of government institutions web pages demonstrates the gap in government on-line services uptake by population living in rural areas compared with urban areas, and especially from Chisinau and indicates that the population from rural areas have lower readiness to use e-services.

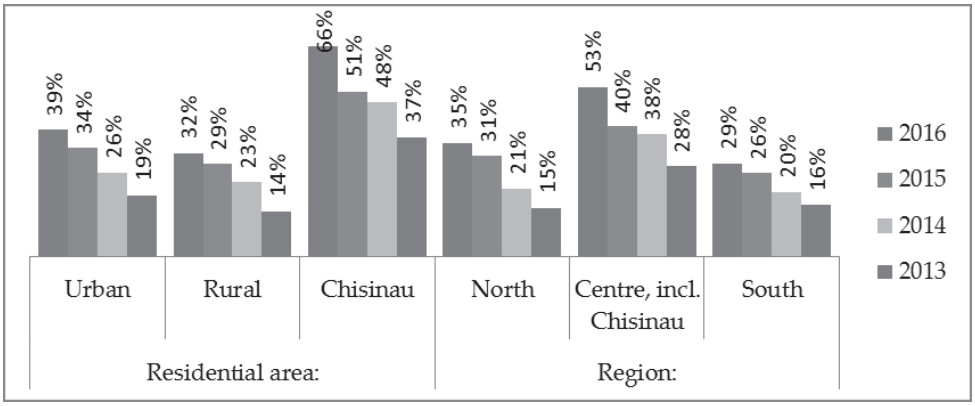

Figure 3: Level of access of web pages of governmental institutions depending on residence areas [2]

Among main causes of lower uptake of e-Government services by *rural population*, but not limited to, are:

- lower average income per capita (approx. 66% from urban level) [14];
- massive emigration of the most young and active part of population, the remained part of population being elderly people; [3]

- lower number of computers per household (60% compare to urban - 77% and the capital Chisinau - 86%) [2];

- lower Internet usage (59% compared to urban - 79% and the capital Chisinau - 92%) [2];

- lack of e-services provided by local public authorities and lack of ICT skills.

One important factor is the territorial – administrative division of the Republic of Moldova. Since 2001, Moldova had reapplied the soviet system of Rayons (districts) as main territorial-administrative units. According to the Law no. 764 from 27.12.2001 on territorial – administrative division of Republic of Moldova [13], the territorial – administrative system is organised in two levels:

1st level - 896 Local Government Units (864 communes (villages) and 32 district residence towns);
2nd level - 38 Local Government Units (5 Municipalities plus 32 Rayons/ Districts, and 1 Autonomous Territorial Units - Gagauzia).

In order to comply to the European standards, since 2007 Moldova is organised in 5 development regions: North, Center, South, Chisinau, and ATU Gagauzia (Law no. 438 from 28.12.2006 on regional development in Moldova, Decision no. 158 from 04.03.2010 on the National Strategy of Regional Development).

In addition, the territory on the left side of the Dniester River, so-called Transnistria, is a specific case, so as Moldavian laws are not applied there.

The existing territorial – administrative division is inadequate for a such small country as Moldova. Because of this system, for the majority of local governments, the expenditures exceed revenues, and there is a lack of resources for capital investments. Also there is a low level of transparency of local government's activity and a weak local fiscal system, as well as many other problems connected with the territorial-administrative structure.

Thereupon, only 28% of the total localities in Moldova are present in the web space - almost half of them have just one informational page (a kind of sub-page) on the website of other institution, most of them on websites of municipal district councils. 193 localities hold a website, and 60 - have blogs [22].

The level of computer and Internet use, as well as that of computer possession in households is directly linked to the citizen education level, i.e. higher level of education induce a higher rate of computer use. [2] The lower level of access of Government web pages by population means as well the lower participation in decision-making process. It was important to find out the mechanisms to enhance the level of local e-services presence and to improve the level of access of government e-

[33] In 2012, according to data of the National Bureau of Statistics (www.statistica.md), 78% of Moldovan labor migrants were aged from 15 to 44 years old, of which 22% were 15-24 years old, and 34% were 25-34 years old. (Migrant support measures from an employment and skills perspective (MISMES) Moldova, 2015)

services by rural population making possible to increase the participation in decision-making process.

How the identified gaps could be closed? What actions may be undertaken to improve the situation? The discussion platform was suggested to be established bringing together representatives of local public authorities, civil society, academic sector, central public authorities to discuss problems in ICT driven local development and to identify most relevant solutions. The project was formulated with the task of creation of such platform on Information Society Development Institute ICT and organizational resources. The platform represents mainly organisational architecture, which established a network of representatives of different actors within Moldovan society and a special website for communication the events, news and project results including on-line broadcasting of project events.

The discussion platform offered by DISCUS project on ICT- driven local development was aimed to identify relevant issues and enhance local participation in the decision-making process that could help in strengthening the capacities of local authorities on the one hand. On the other hand, it was important to stimulate the involvement of central public authorities, academic sector and civil society in discussion of local public authorities' problems. A series of events organised during the project resulted in identification of priority (most necessary) services to be implemented at local level (cadastral e-services, archive services, educational and health services, etc.). The participants showed interest regarding the subject of local electronic services and awareness on the importance of technology in all areas of public life. [8]

Although Republic of Moldova progressed in the digitization of public services at the central level, it still is behind at local level. However, the success of these activities at central level creates promising prerequisites for the digitisation of the local public services, by providing access to registries and databases of central authorities, by transfer of experience, by adapting existing technical solutions to the specific local context. However, at the moment, there is a lack of consolidated vision on local public services that could be digitized, as well as future institutional framework, to ensure their digitization. The Visegrad countries experience and learning from the best practices were considered as a relevant approach within the DISCUS project to enhance the situation in Moldova.

3. Lessons learnt from Visegrad countries experience and recommendations for Moldova case

Despite of the more or less favourable conditions for information society development set up in Moldova, these should be enhanced, especially for closing the rural-urban gap in ICT based development. Although state policies are focused on improvement the global competitiveness of the country and its position in e-Government development ranking [11, 15, 17, 19], lack of financial resources and of venture capital funds is hampering the pace of development progress. Therefore, a series of measures to easier availability of venture capital funds to boost the use of multilateral partnerships ensuring adequate financing for the implementation of approved strategy and policy documents are necessary.

Based on the experience of Visegrad countries, it can be ascertained that the digitization of local services was initiated based primarily on the degree of demand for these services, while the informational support relies, primarily on centralized resources. For Moldova case, the prioritization of public services to be reengineered and digitized at local level shall be based also on the citizen

demand and quick-win approach as already is being used at central level. The most requested services to be provided at local level (based on project events findings), is the issuance of various documents to citizens: family composition certificates, notice of payment of taxes, the certificate on place of residence, certificate about possession (loss) of share of farmland and must be implemented as priority services in a uniform way regardless of the locality.

The legal-normative framework has a key role in the digitization of local public services, in the absence thereof, the services that could be provided in electronic form become mainly only information services for the citizens. [7]

Interoperability remains a condition for digitization of local public services, this task being, most certainly, the responsibility of central authorities, which should develop and publish interoperability standards and unified methodological approach. In spite of existing regulatory documents on the interoperability of services [16, 17] and functioning interoperability platform M-Connect, the level of interoperability between information systems of government institutions shall be further strengthen based on best V4, EU practices and ISO interoperability standards. The digitization of public services can be performed only after their successful reengineering. In many cases, preserving existing technological schemes for the delivery of local public services remains a major obstacle to achieve efficient services and ensure universal access. [7] An important role in facilitating the digitization of public services in Visegrad countries was played by the standardization of public services, which allowed increasing their accessibility and reducing costs for development and implementation of a proper information infrastructure.

Digital technologies are progressing, which could repel less knowledgeable citizens. In order to ensure universal access to local digital services it is necessary to develop/purchase ICT tools, not dependent of certain manufacturers of digital equipment and technology (technological neutrality), as well as to implement life-long learning programs for potential applicants of digitized local public services. [6]

One of the major priorities in the government IT systems infrastructure building area shall be increasing involvement of local ICT companies removing artificial barriers such, for example, as very high level of company income requirements for participation in tenders. Public-private partnerships are a key to success in digitizing local services. It is for certain, that setting-up ICT departments for maintenance and especially the development of new ICT tools in every public authority, is not feasible in a situation of a permanent lack of financial resources.

In terms of capacity building, the training of qualified ICT staff should be set as a national priority. In order to strengthen young people's digital potential, a network of competence centres in areas outside the capital was recommended by participants at the project events. Measures aimed to increase the ICT competence of teachers is necessary, the development of motivation mechanisms to increase the use of interactive methods and modern ICTs in the teaching process to ensure availability of ICT skilled local workforce is a must.

The digitization and uptake of local public services in Visegrad countries became possible due to extensive digital literacy campaigns of the population, especially the elderly. The change of attitude and mentality of the citizens towards the way of providing local public services based on their digitization should be a task, as important as equipping public authorities with ICT tools for electronic provision of the services. [8]

In terms of building confidence and security in the use of ICT, special attention should be paid on training courses on information security. It is necessary to increase the efficiency of ICT implementation at the regional level, because ICT tools are poorly implemented at the local level, due to the lack of funding and qualified staff.

It is necessary to promote the active use of ICTs, as a tool for environmental protection and sustainable use of natural resources. The country is an agrarian one and modern development requires ensuring the full integration of ICT in agriculture, rural development and systematic dissemination of information and knowledge in agriculture using ICTs.

Based on Visegrad experience, clearing the digital divide between urban and rural environments is a necessary condition for successful implementation of digital services provided by local authorities. In this context, Government support is necessary for implementation of information systems at the local government level in Moldova to close the rural-urban gap [7].

The digitization of local public services has a social and economic impact only when any of the services can be accessed from any public authority and are provided in a uniform manner. A key role in facilitating universal access to digital services is implementing common means of identification and authentication of users, regardless of the access point and specific public authority. In the area of access to information and knowledge, practical steps are needed to provide public access points to information for the citizens on local authorities' activities, including information on the activities of state institutions on their official websites, taking into account providing access to people with disabilities.

DISCUS platform, maintained by ISDI and supported by e-Government Centre and competent central government authorities could serve as a reference platform for the exchange of information, documents, forms, etc., to support and guide the local public authorities in developing ICT-based services.

Coordination and synchronization of effective and efficient assistance projects financed by donors for local public authorities is necessary, to exclude overlapping and duplication of efforts and activities. Continuous support for local public authorities on ICT capacity building and project management, use of tested applications, document management systems, etc. is necessary. A first step towards implementing new technologies at the local level is the establishment as medium to long-term priority and allocation of resources (financial, human, etc. if possible) for the development of ICT. It is advisable that ICT-based development to be stipulated in local development strategies and other policy documents of municipalities / local councils, district councils. [10]

4. Project impact

Involving different stakeholders within project activities enabled the DISCUS Platform to become a focal point, an efficient communication platform for all stakeholders interested in information society development process in Moldova. [4] An important feature of the DISCUS project is that more than 430 people (mayors, deputy mayors, secretaries of local councils, specialists from local and central public authorities, public servants, representatives of academic sector and of civil society) from 32 districts (rayons) of the Republic of Moldova became aware of what e-services mean and how they can influence the public administrative processes, as well as decision-making process. [12]

Local Public Authorities representatives benefited through enhancing their institutional capacity for participation in the decision-making process on central level, study visits that contributed to exchange of best practices on concrete and practical examples, as well as strengthening collaboration with V4 countries and will continue to benefit using the created platform with all posted information. Recommendations on public policies' amendments based on V4 best practices [7] and the input of seminars' participants contributed and will continue to contribute towards enhanced policy/legal/regulatory documents. Development of the action plans for implementation of local e-services in rural localities will lead to improved citizen services. [9] During the events, the local representatives had the opportunity to express their problems on how they can solve them with ICTs, receiving advice and consultations of national and Visegrad experts, resulting in clear visions for the future steps and follow up actions.

The project was assessed positively by the government representatives (State Chancellery) and Academy of Sciences of Moldova management during project events. [4] DISCUS has become a unique communication platform in Moldova, where central authorities can meet face to face with local representatives, civil society members and other relevant stakeholders.

It is worth to underline that due to continuous progress in e-Transformation Agenda, including wide discussions on DISCUS platform, a new important document has been issued on modernization of public services in Moldova – "Action Plan on public services modernisation reform for 2017-2021" [1], containing solutions for a majority of identified and discussed issues on DISCUS platform, such us, but not limited to:

- Minimal quality standards of public services;
- Building capacities of employees involved in public services delivery;
- Establishment of learning platform on reengineering, digitization and provision of public services;
- Launching a special program for training of citizen and business in use of e-services;
- Prioritization, reengineering and digitization of selected public services;
- Enhancing use of interoperability platform.

The European Union will provide "Technical assistance for reengineering of selected public services delivery 2016/S 126-224601" to support the Government in reengineering of selected public services and their country-wide delivery and in carrying out the digitisation of 5 selected public services and consolidation of the infrastructure for digitised services sustainability with the indicative budget of 4 m EUR [18]. The DISCUS results were used by public authorities representatives in formulation of needs for the assistance project and this assistance will undoubtedly have a substantial impact on further implementation of policy documents and action plans based on the best EU practices.

In January - February, 2017 a new package of legal-normative documents on interoperability is being in the process of wide discussion: The Draft Law on Interoperability and Data Exchange, The draft Regulation on Semantic Catalogue.

In conclusion, it may be stated that such platforms create favourable environment for open, democratic and productive discussions on important community problems and identifying collaborative solutions based on best practices of advanced countries in ICT based development.

5. References

[1] Action Plan on public services modernisation reform for 2017-2021, Government Decision nr.966 of 9.08.2016.

[2] Annual National Survey Citizens' perception, uptake and support for the e-Transformation of Governance in the Republic of Moldova (2016) CBS AXA, Electronic Governance Centre, Chisinau, Moldova, http://egov.md/ro/resources/polls/sondajul-national-perceptia-asimilarea-si-sustinerea-de-catre-populatie-e-2

[3] Annual National Survey "Perception, assimilation and support by population of the e-Government Transformation in Moldova", CBS AXA, Electronic Governance Centre, Chisinau, Moldova, 2015.

[4] COJOCARU, I. and ŞTEFANIŢA, A.: DISCUS - proiectul de succes al anului 2015. Akademos, 4, 2015, pp. 18-19.

[5] Concept of Citizen Information and Service Centre, USAID, Local Government Support Project in Moldova, Chisinau, 2013.

[6] DATEL, V., ATLASIEWICZ, K., COSULEANU, I. and GREMALSCHI, A.: Research Study Recommendation on Implementation of Relevant Information System for Local Authorities. Chisinau: Information Society Development Institute, 2015, 39 p.

[7] DATEL, V., ATLASIEWICZ, K., BENKO, V., COSULEANU, I. and GREMALSCHI, A.: Research Study Recommendations on public Policies, Regulations/ Amendments for the Relevant Public Authorities from the Republic of Moldova. Chisinau: Information Society Development Institute, 2015, 54 p.

[8] DATEL, V., ATLASIEWICZ, K., BENKO, V., GREMALSCHI, A., COSULEANU, I., STEFANIŢA, A. and COJOCARU, I.: Recommendations on Local Public e-services to be Developed. Chisinau: Information Society Development Institute, 2015, 36 p.

[9] DATEL, V., ATLASIEWICZ, K., BENKO, V., GREMALSCHI, A., COSULEANU, I., STEFANIŢA, A., COJOCARU, I., COJOCARU, I. and FRIPTULEAC, L.: Recommendations on Action Plan for Implementation of Local e-services. Chisinau: Information Society Development Institute, 2015. 37 p.

[10] DATEL, V., ATLASIEWICZ, K., BENKO, V., GREMALSCHI, A., COSULEANU, I., STEFANITA, A., COJOCARU, I. and COJOCARU, I.: Final report Discus project, Discussion on Information Society Building Issues Platform. Chisinau: Information Society Development Institute, 2015, 106 p.

[11] Digital Moldova 2020 Strategy and Action Plan Government Decision nr. 257 as of 31.10.2013.

[12] DISCUS project web page www.discus.idsi.md

[13] Law no. 764 from 27.12.2001 on territorial – administrative division of Republic of Moldova

[14] National Bureau of Statistics, Republic of Moldova, www.statistica.md

[15] National Strategy on increasing the competitiveness of IT industry for the years 2015-2021, Government Decision no. 254 from 05.14.2015, Moldova.

[16] Piloting the Interoperability Platform, Government Decision nr.404 of 02.06.2014 http://lex.justice.md/md/353238/

[17] Roadmap for increasing the competitiveness of the Republic of Moldova http://www.mec.gov.md/sites/default/files/document/eng_roadmap_on_competitiveness_final-approved_by_gom.pdf

[18] Tenders. Services 224601-2016 http://ted.europa.eu/udl?uri=TED:NOTICE:224601-2016:TEXT:EN:HTML

[19] The Interoperability Framework Program Government Decision nr.656 of 05.09.2012. http://lex.justice.md/md/344700/

[20] The Strategic Program on Governance Technological Modernization (e-Transformation). Government Decision nr.710 of 29.09.2011. http://lex.justice.md/md/340301/

[21] Unique Public Services Portal, www.servicii.gov.md

[22] Web presence of cities and villages in Moldova, http://idsi.md/prezenta-web-a-localitatilor-din-Republica-Moldova

THE ROLE OF INTERNET AND SOCIAL MEDIA IN RECRUITMENT IN CERTAIN ISLAMIC TERRORIST ORGANIZATIONS. CASES OF AL QAEDA AND ISIS

Ruslana Grosu[1] and Vasile Bubuioc[2]

Abstract
This research is an attempt to resume and elucidate the practical valence of the academic works, published in the Western countries and Russia. The main goal of this study was to substantiate, in terms of theoretical and methodological aspect, the contents of publications, which reflect a wide range of topics, such as the propaganda, manipulation and recruitment in the terrorist organizations through the social media and the Internet, accentuating the psychosocial components, and highlighting the practices to combat this phenomenon.

The paper focuses on the issue that the Internet and global networks significantly increased the potential for terrorist organizations Al Qaeda and ISIS to carry out their criminal plans. The authors based their research on the thesis that global network represents a new virtual environment, favourable for the online criminal acts, including the recruitment in the terrorist organizations such as Al Qaeda and ISIS. They use the Internet as means of psychological warfare through the dissemination of disinformation and horror, for recruitment of new members.

The researchers underlined the amplification of the recruitment through various social networks. The anonymity and a large audience allow different interest groups, regardless of their place of residence, an uncontrollable and secret communication. The recruitment in the cyber terrorist communities has been conducted in online form by identifying and attracting people interested to support the approach and actions of the terrorist organizations such as ISIS and Al Qaeda.

Key words: *social media, networks, Internet, recruitment, terrorist organizations, Al Qaeda, ISIS.*

Terrorism is considered the gravest form of contemporary breaking of the law, presenting a threat to the international peace and security, reason for which the fight against it requires the joint efforts of all world countries. In the 21st century, this phenomenon, quantitatively and qualitatively, differs from terrorism of "the previous generation" by not only increasing of the threats that bear the terrorist groups, the variety of action strategies and types of terrorist actions, the most modern and sophisticated technical equipment, the types of motivation, and the number of victims. Yet, it became more ominous by the recruiting methods that appeal to the advanced technologies to implement the criminal aims of the terrorist organizations.

The United Nations has included terrorism among international crimes, developing certain legal instruments (conventions, resolutions, etc.) that led to adopt the practical measures to prevent and combat terrorism. [5] The international legal regulation of the fight against terrorism was done both,

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internationally, at the UN level, and, regionally, at the level of the Council of the European Union, the US and Arab countries.

It is important to mention that in 2002 the Council of the European Union had adopted the Framework Decision 2002/475/JHA of 13 June 2002 on combating the terrorism referring mostly to the common definition of *terrorist act* accepted by all EU members and some specific aspects. In response to increasing the terrorist threats, including the use of new information technologies, social networks and the Internet, the Framework Decision 2002/475/JHA was amended in 2008 [7] including provisions specifically on public provocation to commit the terrorist offenses, recruitment, training or granting of other support for terrorist purposes. In this decision, the Council of the EU has taken into consideration the Resolution 1624 (2005) issued by UN Security Council, the Council requiring the EU member states to take measures to prohibit by law the incitement to commit a terrorist act and to prevent such behaviour.

Currently, the role of the social networks and the Internet remains significant, as these tools can be used not only as some cheap, fast and effective means to publish written, audio and video messages with an extremist rhetoric, but also to recruit new members in terrorist organizations, as well as a way to engage with an audience prone to be manipulated and influenced by pro-terrorist propaganda. In the same context, it should be mentioned that the leaders of international terrorism are waging a very hard informational war through the media, and for an easy success have created an enough extensive network that produces a colossal impact on the public, using, as previously there was mentioned, the most modern communication systems, especially the Internet. According to P. Volosyuk's opinion**,** the information systems development and applications for global communication create a number of challenges in ensuring the national security, and they are often used to recruit suicide-bombers or to control the terrorist acts. [17, p. 90]

In C. Bockstette' point of view, the Internet has two roles in relation to media: primary and secondary. The major one refers to its status in the interaction between recruiter and potential member, the Internet becoming the main way for messaging the propaganda, while the methods of broadcasting by media are secondary. [3, p. 17]

The modern opportunities offered by Internet to disseminate the information and its informational impact are superior to that of the media due to the following features: a relatively inexpensive and simple 24/24 access for a large volume of information, regularity and efficiency on the location and sites content changes, the rapid flow of information, the lack of regulation, the number of users in continuing rising. For example, in 2011, according to data provided by Z. Beshukova, the number of Internet users has risen to 2.4 billion, which indicates that one third of the world population has access to Internet, while in 2008 this possibility was enjoyed by less than 20% of the population. [14, p. 265]

A widely discussed topic in academic works is the method used by the terrorist organizations to recruit new members through the social networks and the Internet. In fact, T.L. Thomas approached and described the issue of cyber strategy very detailed, more exactly the Internet using by terrorist organizations, his research being complemented by the article "Al Qaeda and the Internet: The Danger of "Cyberplanning"", which focuses on 16 possible ways of virtual network use by terrorist organizations. [11] In this regard, G. Weymann, quoted by M. Conway, distinguished eight methods by which the terrorist organizations already are accessing the Internet. This fact is confirmed by resorting to psychological war, data searching, fund raising, recruitment and mobilization, networking, information sharing, planning and coordination. In the same context, M. Conway

concluded that methods of Internet use by terrorist organizations have been defined by different authors, which are largely similar, and in spite of the fact that researchers have proposed 22 ways, the experts have often used different terms to refer to same method. [4, p. 3] Given these coincidences, the following analysis is based upon the identification of five ways to use the Internet for the terrorist organizations: 1) information providing; 2) funding; 3) networking; 4) recruitment and 5) information gathering. Each of the authors mentions the resources' production and information providing, particularly the propaganda by the terrorist organizations, having the Internet as the main means. The author summarizes some uses, including secure communication and planning in the process of "network building". In addition, while regarding the recruitment there were pronounced only two researchers, quoted by M. Conway, such as T. L. Thomas and G. Weymann [4], we note that several authors who have approached these views expressed that the Internet is used to promote the terrorist activity, attracting new members in terrorist organizations.

Referring to the use of the Internet by terrorist organizations, M. Conway made reference to the research developed by S. Fernely and M. Worren, who wrote in 1999 that their main methods were resorting to propaganda or advertising on the Internet, funds collecting, information disseminating, secure communication, and, in addition, the same list was presented by F. Cohen in 2002.

In this regard, researchers S. Gerwehr and S. Daly mentioned that the terrorist organizations frequently used the propaganda, disseminated through certain virtual platforms, such as web pages and chats protected by limited and secured access as means of a secret recruitment. [9, p. 83] There are opinions that the terrorist propaganda is often intentionally designed to create an attractive image of terrorist organizations in front of the vulnerable and marginalized groups of society.

Analysing the dynamics proposed by M. Musaev and I. Abdulaev, there were identified several stages, the first and second of which were not relevant to that study. The authors have focused attention on the *third stage* – the propaganda through the websites [20, p. 52], because, as we mentioned earlier, in the mid-2000, the Internet quickly entered the daily life, becoming one of the most important sources of information, beyond television and other forms of communication. So, it has become the most convenient and cheapest tool of propaganda for clandestine activity of terrorist organizations and extremist groups. That method of recruitment was intended to expand the possibilities of changing the consciousness of the individual by resizing and strengthening of the morality models. As other researcher remarked, in 1998 there were only 12 sites, in 2005 their number reached already 4 800 (in different languages), while in 2016 – over 10 000 sites, about 200 are in Russian language). [19, p. 100] Referring to the *fourth stage* – the propaganda through the social networks, it has become a substitute for real communication, as M. Musaev and I. Abdulaev stated [20, p. 52].

Regarding the recruitment process through the Internet, various social networks, mobilizing the supporters to actively encourage the terrorist activities, M. Conway illustrated the procedure by emphasizing that the Internet provides many ways to do: the information became more accessible to be collected by potential "recruits", which is a larger volume of data collected and transmitted much faster in multimedia format; the global networks allow the groups to promote themselves to a large number of people. [4] As a result of growing the capabilities of interactive communications, there appeared a serious opportunity to promote groups and even directly contact with them.

In the context of new members' recruitment by terrorist organizations, N. Golyandin and A. Goryachev noted the same idea to be actively practiced through the Internet and various social networks. The researchers have identified certain features of Internet such as anonymity and the

simultaneous access to a quite wide audience in the absence of the society "censorship", enabling certain interest groups, regardless of their location, to communicate in secret without any control. However, professor I. Sundiev, quoted by previous authors, has underlined that the information technologies ensure the terrorist organizations both resources and influences at global level, but also a range of operating with a very low degree to be discovered. Since most of the terrorist organizations have given up a physical space for meetings, they have resorted to create the virtual communities, through chats and web pages continuing to disseminate the propaganda and trainings. [18, p. 37-38]

The increasing coverage area of the Internet provides to terrorist organizations and their supporters a globally expanded ground to recruit its potential militants. There would be important to note the forums with restricted access that have become for the new recruits, according to D. E. Denning, a secured space where they can get information about the terrorist organizations giving support, and then they continue shortly with measures to promote the objectives of terrorist activity. [6, p. 198] Finally, using the forums there could be drawn into public debate either supporters or opponents of this group, which could help terrorist groups to identify their position and their tactics eventually to increase, generally, the support and attractiveness.

If initially this study was based mainly on theoretical assertions, then one of the opinions of the military caste representatives, especially that of C. Bockstette, expressed a similar position, just highlighting the peculiarities of this process in terms of the strategic and asymmetrical propaganda through the information technologies. The author analysed in this respect other opinions according to which the recruitment rhetoric is simple: by the counter-hatred of notions *guilt* and *humiliation of honour*, *duty* and *dignity*. [3, p. 12] The theoretical aspect of the study is outlined with references to the theory of M. Sageman, due to which recruits often do exactly what others do, his research being focused on recruiting in the terrorist organization Al-Qaeda, because in 2010 the terrorist organization "Islamic State" (ISIS) did not exist. [3, p. 15]

Regarding the recruitment methods, C. Bockstette wrote in 2010 that terrorists don't have a central organization to handle the recruitment of new members, and for this reason, in addition to traditional recruitment methods (prayers, sermons in mosques and religious schools, media), the Internet holds their top, new members paying attention and time to Internet and social networks. In order to stimulate the transformation of Muslims and non-Muslims in their followers, the recruiters of the terrorist organizations resort to launching certain ideas to inspire them to "radicalization". The social networks and dynamics within the group, especially as pressure from the members of movement plays an important role in forming close emotional ties. [3, p. 11] Already there were known the cases of declared terrorists as the most dangerous in the world, who previously didn't show a special activism, but they were ordinary members, who led a common life, going through a period of deep crisis and a long search of themselves.

The recruiting of new members in virtual communities is made online, i.e. within a system of measures to identify and attract different groups of people, being interested to actively support the opinions and actions of terrorist organizations members. At the initial stage, according to the N. Golyandin and A. Goryachev, the visitor of the site or the forum is brought into debate whether he supports or rejects the views of the site owner, which gives to recruiters the opportunity to enhance discussions and attractiveness, generally, creating the impression of a real support in some discussions. [18, p. 37-38] In the recruitment and radicalization of terrorists, as mentioned by the experts of the European Commission in the field of violent radicalization, there was seeking the tendency to raise a person's feeling of injustice, exclusion or humiliation. [8]

If a potential recruit is not sure to join the group, or the group does not inspire total confidence, he/she is tested in a chat, and if he/she passes the exam, he/she is redirected to another chat to further investigation and possibly could be considered able of direct contact with a group's member. The purpose of this process is a way to select the inappropriate individuals or some undercover intelligence agents and the law enforcement agencies with responsibilities in preventing and combating the terrorism.

There are some suppositions that the online recruiting in the terrorist organizations is widespread, and as example M. Conway brought an Iranian site, as having an attractive source of a self-murdered terrorist' application. [4, p. 13] The propaganda can be adapted to take into account the demographic factors such as the age or gender, and social or economic circumstances. The contribution of A. Rakhmonov was valuable in identifying, in terms of internal and external psychological factors, which led to the young people involvement in terrorist organizations, particularly in the Central-Asian countries, member states of Collective Security Treaty Organization and the Shanghai Cooperation Organization, stressing that the main places and channels for recruitment remain the cyber communities, virtual clubs and social networks (Odnoklassniki, Facebook, YouTube, specialized sites). [22, p. 145]

In recruiting young people, who constitute the majority of network users, the Internet is the most effective way, and the form, in which this is achieved, varies depending on the creativity of recruiters from popular cartoons, videos, music to computer games. The tactics used on websites are managed by some terrorist organizations or associated ones in order to recruit minors, including the use of a mix of cartoons and children' stories with messages that promote the acts of terrorism glorification, such as missions of self-murderer terrorists.

Similarly, certain terrorist organizations develop video games online, to use as a tool in recruiting and training of the beginners. In G. Weimann's opinion, such games can serve as a means of violence' propaganda against the state or officials, offering a reward for the virtual success and can be translated into various languages in order to attract diverse groups of passionate people. [13] In the same context, as N. Golyandin and A. Goryachev pointed out, it became the implementation and expansion of computer games online networks, such as "The Great Game. Break the system", "Falcon. World after the racial war". [18, p. 37-38]

A likewise idea was expressed by M. Musaev and I. Abdulaev, who presented for discussion the model for recruiting in the terrorist organization "Islamic State", clarifying the means and methods of manipulation of ISIS group recruiters and their impact on the consciousness in psychological aspect. [20, p. 52] Many potential recruits get information about ISIS firstly, by media, and, secondly, seek the information on social networking pages.

Regarding the phenomenon of online recruitment practices through the ISIS, R. Torok related with a retrospective on its ascent through the recruitment mechanisms of skilfully using the most popular social networks Facebook, Twitter, and audio-video platforms such YouTube as well. [12]

As the researcher M. Berger noted, the international community remains concerned about the consequences of online hidden activities of the terrorist organization "Islamic State", recruiting from the "periphery" of society the individuals easily persuaded to act on its behalf. [1] Its success is due to the social networks that offer a great potential in recruiting a large number of potential recruits, but to demonstrate this phenomenon, the author comes up with his own detailed vision,

consisting of five parts: identification, creation of micro-communities, isolation, exchange of information and private communication, and the action to identify and encouragement. [2]

Following similar ideas, there should be mentioned the research of L. Mayevskaya, who expressed the same view on the impact of social media on the recruiting process. However, the author brings some conclusions drawn in studies of several researchers, such as R. Suleymanov, who noted that for a skilled propagandist and recruiter itis sometimes enough just his personal page. As example there have been made the pages of militants from Syria, when they, in detail, exposed and posted the footage of the fighting in the area. [19, p. 101] Another quoted author, A. Kabil**,** in her article also points out that the social networks are an effective weapon to recruit supporters for ISIS, recruiters in this group drawing attention to issues that cause disputes and debates. As the author noted, the mechanism of recruitment is quite simple, after posting a video with an act of mass execution and other atrocities, they are waiting for the comments on this video, and soon get in touch with those who have left comments, transmitting distorted information regarding what is happening in Syria. [19, p. 101]

It would be important to mention the large number of pages and communities that operate in order to "supplement" the rows of illegal armed groups and their accomplices, caused by an active propaganda activity of distributing informational materials aimed at inciting to national and religious intolerance. In addition, the Internet has made possible to coordinate the interaction between terrorist organizations remotely, anonymously and in trans-borders format, by hiding effectively the proofs of illegal activities. [21, p. 203]

In this regard, L. Mayevskaya emphasized that the recruiters do not aspire to reach Syria, their mission being to remain away to attract more militants to fight for the organization "Islamic State" and to bring many examples about these networks and "legends", that continues to attract new supporters through the virtual communities after proclaiming the "caliphate" on 29 June 2014. This situation put the matter before ISIS to spread its ideology to another level by extending its forms, and by the communication on Internet, the personal contact is avoided. For example, the recruiting of militants in Russian Federation, but not only there, could be simply made from abroad. In the paper, the author has focused on attracting through social networks of the divorced women and girls, making them promises to marry according Islamic traditions. The researcher stressed an important point regarding the contradictory opinions of caliphate supporters, expressing a disagreement about ideological visions of the terrorist organization "Islamic State". [19, p. 102]

As a classic example for recruitment through the Internet and social networks, most often is given the case of V. Karaulova, examined in clinical psychology as *Varvara Karaulova syndrome.* K. Fedorova states that it is already recognized that the social networking is one of the most effective recruitment tools in support of ISIS. [23, p. 132]

Referring to identifying the logic and ways of recruiters' operations within the ISIS group, M. Musaev and I. Abdulaev have proposed to determine the factors which could result in such a terrorist organization, when a person with a decent behaviour and suitable character, finally the authors coming up with some recommendations to prevent and fight against this phenomenon. [20, p. 52]

Switching from the private communication to the statement of the information exchange on social networks could be a signal to the law enforcement or supervisory, where the context is clearly appropriate (e.g., in response to a question about ISIS or somebody has several connections with

Syria). Such measures should be focused on the most rational recruiters than their targets. Yet, the investigation demonstrates that the recruiters call to action appears to be a successful one, to the criminal liability is drawn the potential recruits, too.

One of the virtues of the Internet and social networking is that they put the pursuit of human interactions in a relatively narrow frame, which allows the monitoring of interaction in "backstage" style and recognize the processes when they occur repeatedly. Proceeding from the above, we emphasize that not all the users of virtual networks that have challenged any subject or action with an extremist-terrorist content should be immediately punished and we do not advocate for banning social networks and Internet or removing them just because they could be accessed by people with some delinquent intentions. The essence of the problem actually lies in the fact that the appearance of anonymity and high degree of difficulty, practically impossibility, to punish the weaned citizens of all world countries to realize the consequences before committing an action and to assume obligations for their acts.

Regarding the combating of recruitment, N. Bolychev proposed six levels to combat the interest in attracting young people in terrorist organizations, stressing the fact that the members of terrorist organizations are actively using the Internet for disseminating the extremist materials, attracting new supporters to its ranks and coordinating the illegal activity. Also, an opportunity provides the social networks VKontakte, Odnoklassniki, Facebook [15, p. 203], other authors adding that Twitter, Instagram, Ask.FM, Friend, Quitter, Diaspora. [21, p. 185]

Thus, intelligence services should cooperate actively with local authorities, other agencies and bodies of law enforcement for effectively counterterrorist activities with youth involvement in terrorist organizations, conducted through the Internet. Creating a social and informational positive environment, consistently strengthening at the legislative level the mechanisms to ensure a proper education of youth could help to a significant reduction of the terrorist offenses, and to oppose an effective resistance in the recruitment of young people in terrorist organizations.

In appearance to counter the recruitment phenomenon through the social networks, the researcher L. Mayevskaya wrote that the "hybrid-war occurs at a much larger scale in human consciousness, and after that on the battlefields". [19, p. 102] Likewise, she expressed the view that those measures should be carried out by not only blocking and closing the extremist groups and platforms, but the use of social networks should become the platform to counter the terrorist propaganda and recruitment processes.

In order to counter the phenomenon of recruitment online, E. Saltman and M. Smith, proposed to develop the counter-propaganda means designed especially for Muslim women and to strengthen the critical perception of propaganda by youth on the example of recruitment methods applied by ISIS. The authors identified three levels of prevention activities aimed to young people aged between 14 and 25 years (depending on the target audience): ISIS supporters, interested young people and the rest of the youth. [10, p. 52-57]

In the same context, other authors have expressed their position regarding the countermeasures considering that the government censorship of the Internet in not enough. It is necessary to attract the NGOs, independent activists, institutions of civil society, the countering of ISIS requiring to be both coordinated and decentralized. [16, p. 90] The countermeasures must work vigorously on recruitment efforts, challenging of terrorist propaganda being carried out at every possible opportunity.

Finally, we conclude that the Internet and the means of advanced information technologies have become used to promote and support the terrorism, particularly in terms of propaganda (including for the purpose of recruitment, radicalization and incitement to terrorism), training and financing, planning and execution of such acts. In addition, the focus is on the opportunities offered by the Internet to detect and prevent the terrorist acts, including the intelligence gathering and other activities to inform in advance and deter them and gather evidence for prosecution of such acts. The strategic communication can become an effective means to disrupt the process of radicalization, manifested by terrorist acts. A demonstrated understanding of the issues is important in engaging in a constructive dialogue with the potential recruits into terrorist activities to promote some alternative causes.

Therefore, while, theoretically, the official channels of international cooperation are vital, in practice, the informal channels remain equally important. Regardless of the cooperation methods, the high level of trust between national and international authorities is a key-element within an effective cooperation process. In addition to the cooperation under formal treaties or similar legal instruments, or the sub-regional initiatives, aimed at strengthening cooperation in law enforcement, are equally important. The states with common interests in security could conclude some collective agreements providing for the transfer of information and exchange of related intelligence informative papers. Proceeding from the above, we plead for the following recommendations:

1) the national and international legal regulation in terms of preventing and combating of the cyber terrorism by analysing the national and international normative acts in counteracting propaganda through the social networks and Internet;

2) the elaboration of certain appropriate strategies that would provide some effective tools to prevent and combat this kind of crime;

3) the monitoring of the social media by intelligence services, with respect to the fundamental human rights, social phenomena and events that could degrade in some internal conflicts or could lead to destabilization of the public order and the state security;

4) the cooperation and joint efforts of the state, civil society and citizens on the need to eradicate the propaganda of terrorism on social networks and on Internet, to eliminate the causes and conditions, and to eradicate the terrorist ideology, promoted by cartoons, music, popular video clips and computer games;

5) the continuous studying of the recruiting methods for young people through the social networks and Internet and development of the effective measures to prevent and combat the recruitment in the terrorist organizations.

References

[1] BERGER, J.M.: How terrorists recruit online (and how to stop it). https://www.brookings.edu/blog/markaz/2015/11/09/how-terrorists-recruit-online-and-how-to-stop-it/. (12.11.2016)

[2] BERGER, J.M.: Tailored online interventions: the Islamic State's recruitment strategy. https://www.ctc.usma.edu/posts/tailored-online-interventions-the-islamic-states-recruitment-strategy. (12.11.2016)

[3] BOCKSTETTE, C.: Terrorists exploit information technologies. Use of Strategic Communication Calls for United Response, in: Per CONCORDIAM, vol. 1, No. 3, 2010.

[4] CONWAY, M.: Terrorist 'Use' of the Internet and Fighting Back, in: Conference Cybersafety: Safety and Security in a Networked World: Balancing Cyber-Rights and Responsibilities, Oxford Internet Institute (OII), Oxford University, UK, 8-10 September, 2005. https://www.oii.ox.ac.uk/archive/downloads/research/cyber safety /papers/maura_con way.pdf. (12.11.2016)

[5] Countering the Use of the Internet for Terrorist Purposes — Legal and Technical Aspects. May 2011. http://www.un.org/en/terrorism/ctitf/pdfs/ctitf_interagency_wg_compendium_ legal_technical_aspects_web.pdf (01.12.2016)

[6] DENNING, D.E.: Terror's web: how the Internet is transforming terrorism, in: Y. Jewkes, M. Yar (eds.) Handbook of Internet Crime, Willan Publishing, 2010. (.pdf of pre-publication version). http://hdl.handle.net/10945/37164.

[7] EU Council Framework Decision 2008/919/JHA of 28 November 2008 amending Framework Decision 2002/475/JHA on combating terrorism, 28.11.2008, 2008/919/JHA.

[8] European Commission, Expert Group on Violent Radicalisation, Radicalisation processes leading to acts of terrorism (2008). See: www.clingendael.nl/publications/2008/20080500 _cscp_report_vries.pdf. (12.11. 2016)

[9] GERWEHR, S. and DALY, S.: Al-Qaida: terrorist selection and recruitment, in: D. Kamien (ed.), The McGraw-Hill Homeland Security Handbook, McGraw-Hill, New York, 2006.

[10] SALTMAN, E.M. and SMITH, M.: Till Martyrdom Do Us Part' Gender and the ISIS Phenomenon, Institute for Strategic Dialogue, London, 2015.

[11] THOMAS, T.L.: Al Qaeda and the Internet: The Danger of "Cyberplanning", http://7.iwar.org.uk/cyberterror/resources/cyberplanning/thomas.pdf. (01.12.2016)

[12] TOROK, R.: ISIS and the Institution of Online Terrorist Recruitment. http://www.mei.edu/content/map/isis-and-institution-online-terrorist-recruitment. (12.11. 2016)

[13] WEIMANN, G.: Online terrorists prey on the vulnerable, YaleGlobal Online, 5 March 2008. See: http://yaleglobal.yale.edu/content/online-terrorists-prey-vulnerable. (12.11. 2016)

[14] БЕШУКОВА, З. М.: Противодействие экстремизму в Интернете: международный, зарубежный и внутригосударственный аспекты, in: Библиотека криминалиста, 2013, № 6. (BESHUKOVA, Z.M., Counteraction of extremism in Internet: international, foreign and domestic aspects, in: Criminalist's Library Scientific Journal, 2013, No. 6).

[15] БОЛЫЧЕВ, Н.И.: Противодействие вовлечению молодежи в радикальные организации, осуществляемому с помощью сети интернет, in: Вестник Воронежского института МВД России, 2016, № 1. (BOLYCHEV, N.I., Counteraction of youth involvement in radical

organizations, carried out by the internet, in: VESTNIK of Voronezh Institute of the Ministry of the Interior of Russia, 2016, No. 1).

[16] БЫКАДОРОВА, А.С., ЧУРИЛОВ, С.А. and ШАПОВАЛОВА, Е.В.: Экстремизация молодежной аудитории сети интернет, in: Казанский Педагогический Журнал, 2016, № 3. (BYKADOROVA, A., CHURILOV, S., SHAPOVALOVA E., The extremism of youth in Internet, in: Kazan Pedagogical Journal, 2016, No. 3).

[17] ВОЛОСЮК, П.В.: Экстремизм как современная угроза российскому обществу и государству, in: Гуманитарные и юридические исследования, 2014, № 4. (VOLOSYUK, P.V., Extremism as present-day menace to the Russian society and state, in: Humanities and Law Research Journal, 2014, No. 4).

[18] ГОЛЯНДИН, Н.П. and ГОРЯЧЕВ, А.В.: Мотивации вербовки в экстремистские и террористические организации, in: Вестник Краснодарского Университета МВД России, 2013, № 2. (GOLYANDIN, N.P., GORYACHEV, A.V., Motivation for recruitment in extremist and terrorist organizations, in: VESTNIK of Krasnodar University of the Ministry of the Interior of Russia, 2013, No. 2).

[19] МАЕВСКАЯ, Л.Б.: Социальные сети и методы вербовки сторонников ИГ, угроза национальной безопасности стран СНГ, in: Современные Евразийские Исследования, Научный журнал, 2015, Выпуск 4. (MAYEVSKAYA, L., Social networks and methods of recruitment of supporters of the IS, the threat to national security of the CIS countries, in: Contemporary Eurasian Studies, Academic journal, 2015, Issue 4).

[20] МУСАЕВ, М.М. and АБДУЛАЕВ, И.М.: Способы и методы психологического воздействия на сознание людей, используемые вербовщиками ИГИЛ для вовлечения в свои ряды новых сторонников, in: Международный Научно-Исследовательский Журнал „Успехи современной науки и образования", 2016, №7. (MUSAEV, M.M., ABDULAEV, I.M, Techniques and methods of psychological influence on the minds of people used by ISIL recruiters for enlisting new supporters, in: Успехи современной науки и образования, 2016, No. 7).

[21] МУХАМЕТЗАРИПОВ, И.А.: Зарубежный опыт противодействия пропаганде ИГИЛ в среде «европейских» мусульман, in: Казанский Педагогический Журнал, 2016, № 3. (MUKHAMETZARIPOV, I., The foreign experience of counteraction to DAESH propaganda among the "European" Muslims, in: Kazan Pedagogical Journal, 2016, № 3).

[22] РАХМОНОВ, А.С.: Внешние и внутренние факторы вовлечения молодёжи в ряды террористических организаций, in: Казанский педагогический журнал, 2013, №6. (RAKHMONOV, A.S., External and internal factors of the youth involvement in the terrorist organizations, in: Kazan Pedagogical Journal, 2013, № 6).

[23] ФЁДОРОВА, К.В.: Вербовка как искусственное формирование поведенческой аддикции на примере синдрома Варвары Карауловой, in: Казанский педагогический журнал, 2016, №6. (FEDOROVA, K., Recruiting as an intentional formation of behavioral addiction (on the example of Varvara KARAULOVA syndrome), in: Kazan Pedagogical Journal, 2016, № 3).

ICT IMPACT ON DEVELOPMENT OF KNOWLEDGE ECONOMY IN UKRAINE AND REPUBLIC OF MOLDOVA

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Abstract
In this paper, the authors analysed the value of the development of information and communication technologies as an innovative resource of the knowledge economy. The analysis of the knowledge economy state of Ukraine and Republic of Moldova in the international dimension is conducted. The statistical analysis is based on macro data of the Global Innovation Index for the period 2012-2016 that limits the relevance of the results obtained. The practical examples of information and communication technologies used by public sector in the knowledge economy are described. It is proved the importance of information and communication technologies as a key component of the economic system based on knowledge.

The paper has the goal to underline the positive aspects of the knowledge economy in Ukraine and Republic of Moldova due to ICT tools but also to put into discussion the backlogs of the development processes in these countries.

1. Introduction

1.1 The scope of the paper

The knowledge economy is quite controversial phenomenon, as it puts innovation processes of different levels at the centre of the economic system. And the world competitiveness of any country is closely connected with the state of the development of the knowledge economy.

Transformation processes in Ukraine and Republic of Moldova connected with their European integration intentions require a deep reload of both their economic systems and public management. As both countries represent post-soviet states, it is interesting to compare the state of their knowledge economies development in general and the level of implementing information and communication technologies as an innovative resource of the knowledge economy at the example of public sector.

1.2 General notes on knowledge economy

Accelerated innovative transformation of the modern economy shows the increasing importance of knowledge as a decisive factor in innovation and technological development. Under the new conditions other basics of the globally competitive national economy, except in the form of a

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"knowledge economy" does not exist. This trend changes the configuration of the mechanism of economic growth [27].

The knowledge economy is defined as a special innovative model of production in the form of complementary information and communication technologies, human capital (using these technologies) and the creative potential of firms (implementing productivity of the first two elements) on the background of social networks, which will replace the traditional forms of organization of the market in the knowledge economy [2].

Deepening economic diversification, the predominance of a knowledge-based and high-tech products in the structure of GDP, the dominance of networking interaction of economic agents are the hallmarks of the knowledge economy's growth [7; 9].

Conceptual interpretation of the "knowledge economy" as a special production method understands it as a system, in which the processes of generation, application and dissemination of knowledge play a dominant role in the creation of tangible, material and intellectual wealth, as well as generally accepted social values.

In the public sector the knowledge economy has its own specifics. It requires the utilization of the knowledge in order to improve the transparence, the services delivering to the citizens, for a better communication with the citizens/users/clients and in order to improve the knowing degree of their needs [14].

2. Knowledge economy state of Ukraine and Republic of Moldova

Development of knowledge economy is defined by modern economic theory and practice of effective public and business activities as a key factor of the sustainable economic development. According to Mahfouz E. Tadros [20] knowledge-based development requires strong R&D institutions, an industrial base, a pool of skills and competences, a strong physical and cyber infrastructure, and a business-friendly regulatory framework.

One of the strategic directions of development for Ukraine is modernization of its social and economic system on the base of implementing new technologies and innovations in all spheres of human activity, synchronization of the development of nature, economy and human [4]. Such modernization is also important for Moldova. Moreover, a big emphasis in Moldova is on IT development, that started from the government level (since 2011 through Governance e-Transformation Program and Project with the World Bank support) and besides public processes is oriented as well to citizens and business.

Nowadays various frameworks and methodologies are used for assessing the development of knowledge economy of countries. These instruments are developed by such organizations as World Bank Institute [30], the Organization for Economic Cooperation and Development (OECD) [13], the European Union institutions [11], World Economic Forum [31] and the World Intellectual Property Organization in collaboration with Cornell University, INSEAD [25].

As the aim of our paper is to show the value of the development of information and communication technologies as an innovative resource of the knowledge economy, in our research we used the Global Innovation Index (GII) data for the period 2012-2016. It also helped us to present the analysis of the knowledge economy state of Ukraine and Republic of Moldova in the

international dimension as GII is used as one of the main world indicators of the knowledge economy's state.

In general, according to the GII Report 2015 [24] the Innovation Input Sub-Index consists of five input pillars that capture the national economy elements that enable innovative activities and reflects the innovative character of the country's knowledge economy: (1) Institutions, (2) Human capital and research, (3) Infrastructure, (4) Market sophistication, and (5) Business sophistication. On the other hand, the Innovation Output Sub-Index is comprise of two output pillars that are the results of innovative activities within the economy: (6) Knowledge and technology outputs, (7) Creative outputs.

2.1 Ukraine situation

The analysis for Ukraine as a representative of the lower-middle-income countries in GII 2015 shows that from 2014 it remains in the top 10 countries of this group.

Ukraine outperformed its peers in at least four innovation input or output pillars of GII during 2011-2014 (Table 1). It is also positioned as an innovative achiever, but not improved its total GII ranking during 2014-2015. Ukraine demonstrates rising levels of innovation results because it has a skilled labor force with expanded tertiary education. In 2016 Ukraine takes 40th position among the investigated countries in GII 2016 Report, but it has lost 4 positions in comparison with 2015 year. Despite this fact the result for (2) Human capital & research in 2016 (40th place) is higher than in 2012 (48th place).

Index	2012	Δ 2013-2012	2013	Δ 2014-2013	2014	Δ 2015-2014	2015	Δ 2016-2015	2016
GII	63	8↓	71	8↑	63	1↓	64	8↑	56
1. Institutions	117	12↑	105	2↑	103	5↑	98	3↓	101
2. Human capital & research	48	4↑	44	1↓	45	9↑	36	4↓	40
3. Infrastructure	98	7↑	91	16↓	107	5↓	112	13↑	99
4. Market sophistication	68	14↓	82	8↓	90	1↑	89	14↑	75
5. Business sophistication	51	28↓	79	8↓	87	9↑	78	5↑	73
6. Knowledge & technology outputs	30	15↓	45	13↑	32	2↓	34	1↑	33
7. Creative outputs	83	2↑	81	4↑	77	2↑	75	17↑	58

Table 1: GII for Ukraine

Source: composed and calculated by the authors on the basis of [21; 22; 23; 24; 25]

The country demonstrates the lowest results by such indicators as Institutions and Infrastructure among other innovative inputs. Despite this fact, there is a conventionally positive dynamics for 2012-2016 by theses indicators. For example, 117th place (2012), 103rd place (2014) and 101st place

(2016) of Ukraine by (1) Institutions show that the country isn't attractive very much for businesses and doesn't provide good governance and the correct levels of protection and incentives that are essential to innovation.

At the same time there is some negative dynamics for (4) Market sophistication and (5) Business sophistication, especially in 2012-2014. There is a statement in the concept of reform of government policy in the field of innovations approved by Resolution of the Cabinet of Ministers of Ukraine (CMU) no. 691 of 10.09.2012 that the majority of businesses are technologically backward and energy-intensive. It is connected with bad market conditions and a lack of credit investments for innovations development. And it also demonstrates the failure of the state innovation policy of Ukraine and its principle of independent innovation development.

It is visible that there is a gap between such pillar as (2) Human capital & research and all other elements of GII for Ukraine.

By innovative outputs Ukraine takes good position in GII ranking. In 2016 it has 33rd place by (6) Knowledge & technology outputs and 58th place by (7) Creative outputs. Comparing the country's positions for the 2012-2016 periods by these indicators, the authors should admit that Ukraine has saved the average results for (6) Knowledge & technology, but it has also improved its results by (7) Creative outputs for the same period of time (83rd place in 2012 and 58th place in 2016).

To improve its innovativeness and competitiveness on the way of transformation to the knowledge economy in 2013 CMU adopted the Strategy of information society development in Ukraine by Resolution no. 386-p of 15.05.2013. To realise this strategy in 2015 Ukraine joined Horizon 2020 to work with EU in science and research. The agreement was ratified by the Ukrainian Parliament and entered into force. According to it Ukrainian legal entities can participate in all Horizon 2020 actions funded under the 2015 budget, as this association covers the years 2015-2020 [5].

2.2 Republic of Moldova situation

According to the Global Innovation Index Report from 2015, the Republic of Moldova is one of the eleven developing countries that are labelled 'innovation outperformers' because they conform to the following two more stringent rules:

- their GII score relative to their GDP is significantly higher than it is for other economies (they attain 'innovation achiever' status) for two or more recent years (including at least 2013 and 2014);

- they outperform their income-group peers in a minimum of four innovation input or output pillars (they are designated 'pillar outperformers') for two or more years (including at least 2013 and 2014).

On average, the technology gap between developing and developed countries appears to be narrowing. One explanation is that more and more developing countries outperform in innovation inputs and outputs relative to their level of development (Moldova's case). Among other developing countries, Moldova have realized that technology adoption alone is no longer sufficient to maintain a high-growth scenario; rather innovation is now crucial for catching up to high-income countries. As a result, national innovation policy programmes are flourishing in low- and middle-income countries. The Republic of Moldova has been identified as one of the rising innovators in Europe.

Its performance has been consistent in almost all innovation inputs and outputs during 2011–14 (Table 2). It performed above 75% of the economies in the GII in Knowledge and technology outputs and Creative outputs. These high scores are the result of high numbers of utility model applications and trademark registrations. Indeed, government efforts towards increasing intellectual property rights awareness and encouraging its use led to the establishment of the State Agency on Intellectual Property and the implementation of a National Intellectual Property Strategy, which have been in place since 2011 and 2012, respectively. These efforts may at least partially explain the country's high scores in these indicators. The Republic of Moldova performs poorly in Business sophistication, however, because of weak innovation linkages — in particular its limited cluster development and university-industry collaborations [24].

Index	2012	Δ 2013-2012	2013	Δ 2014-2013	2014	Δ 2015-2014	2015	Δ 2016-2015	2016
GII	50	5↑	45	2↑	43	1↓	44	**2**↓	46
1. Institutions	78	6↓	84	4↑	80	5↑	75	**7**↑	68
2. Human capital & research	55	6↑	49	22↓	71	3↓	74	**23**↑	51
3. Infrastructure	85	4↑	81	7↓	88	6↑	82	**7**↑	75
4. Market sophistication	96	17↑	79	30↑	49	3↓	52	**41**↓	93
5. Business sophistication	104	19↑	85	17↓	102	19↑	83	**6**↓	89
6. Knowledge & technology outputs	31	5↑	26	0↔	26	0↔	26	**5**↓	31
7. Creative outputs	32	0↔	32	0↔	32	6↓	38	**4**↑	34

Table 2: GII for Moldova

Source: composed and calculated by the authors on the basis of [21; 22; 23; 24; 25]

The Republic of Moldova introduced its innovation strategy 'Innovations for Competitiveness' for the period 2013–2020. This strategy aims to stimulate innovation in firms and society in general. In the same context, the Strategy for Research and Development of the Republic of Moldova until 2020 was drafted under the guidance of the Academy of Sciences of Moldova and approved by the Government in December 2013, aiming at increasing investments in research and development to 1% of GDP by 2020. None of the strategies clearly identifies thematic priorities (for example, in the Research and Development Strategy the six societal challenges of Horizon 2020 are mentioned as priorities). During last months of 2016 several decisions were taken referring to Government reform through restructuring the ministries and other central institutions, including research and development & innovation sector. In this respect would follow several mergers, transfer of responsibilities and other institutional and functional changes.

The number of persons employed in Research & Development sector in Moldova decreased significantly due to "brain drain", while among the remaining researchers a certain ageing trend can be observed. At the same time, the R&D field is unattractive (from salary and existing infrastructure points of view) for young talents. The level of knowledge obtained in local universities does not meet market expectations, while attraction of foreign students or researchers is difficult due to unappealing conditions [1].

Both Ukraine and Republic of Moldova belong to the 14 middle-income countries outperforming others in their income group [24]. But, in general, Republic of Moldova takes stronger positions in different components of GII than Ukraine. It happens because of more successful government policy in different spheres of knowledge economy.

3. ICT tools used by public sector in the knowledge economy

Information and communication technologies (ICT) provide almost unlimited possibilities of doing business, scientific and research, artistic and other activities in the Internet, and they allow citizens to participate in forming the policy of developing society, economy and education. ICT, which provided the basis for the knowledge economy, continue to develop and offer the possibility of using new approaches to social and economic development [29]. For example, it is done by involving citizens into the innovation activity. The greatest attention should be paid to communication channels and means of communication and exchange of information between citizens (consumers), manufacturers and governments to use the intellectual potential of society [16].

Currently, a set of ICT goes into a new quality of the interaction with public authorities and private companies. Modern citizens have an opportunity to participate in the discussion of public decisions and influence the formation of national and municipal policies by e-government tools. The use of ICT in the economy allows companies to reach new economic effects by adapting to the ever-changing business environment, the creation of mobile offices, continuous communication with partners and customers.

A new type of communication between citizens, producers and governments via ensuring the free exchange of information is one of the main advantages of the knowledge economy [18].

Key changes occur in the field of mass interaction of public authorities with citizens in the following areas: development of electronic interagency cooperation; providing services in electronic form; development of portals and provision of information on the activities of public authorities; implementation of a universal electronic citizen card. They form the primary basis, the foundation of the "electronic government"; provide a transition of traditional bureaucratic functions in the Internet space. In each of these areas, the government makes great efforts: creates and adapts the regulatory framework, develops and distributes software solutions, conducts constant coordination with the regions and municipalities, sets the pace of development, overcomes resistance, allocates huge resources, etc.

The dynamics of ICT development in public sector of the analysed countries is presented in Table 3 and Table 4. These tables consist of the indicators that are the part of (3) Infrastructure pillar of the Innovation Input Sub-Index of the GII. The basic results are gathered and calculated by the World Intellectual Property Organization in collaboration with Cornell University, INSEAD [21; 22; 23; 24; 25]. The authors composed the data of the tables based on Ukraine and Moldova countries' profiles and then calculated the changes by years.

Index	2012	Δ 2013-2012	2013	Δ 2014-2013	2014	Δ 2015-2014	2015	Δ 2016-2015	2016
ICTs	77	2↓	79	5↓	84	5↓	89	2↑	87
ICT access	58	8↓	66	2↑	64	1↑	63	1↑	62
ICT use	81	15↑	66	21↓	87	2↓	89	3↓	92
Government's online service	88	1↓	89	1↓	90	22↓	112	7↑	105
E-participation	78	1↓	79	0↔	79	3↑	76	2↑	74

Table 3: ICTs for Ukraine

Source: composed and calculated by the authors on the basis of [21; 22; 23; 24; 25]

Ukraine is not among the leaders in the world by ICT (Table 3). In 2016 the country takes only 87th place. It could be explained by the fact that several important legislative reforms such as the Law on Citizens' Petitions (2015), Law on Access to Public Information and Open Data (2015) and the Law on the Open Use of Public Funds were passed in Ukraine.

Government's online service, especially the e-declaration system as its key part, is the most discussed topic in Ukraine during 2016. Now everyone has access to the information about assets and revenues of officials as foreseen by the law № 1022-VIII adopted by the Verkhovna Rada on 15 of March this year [10].

The development of e-governance in Ukraine is also one of the main goals of the EU and Council of Europe joint programme „Strengthening Information Society in Ukraine" [3]. This program aims at improving the freedom, diversity and pluralism of the media and strengthening personal data protection.

E-governance in Ukraine is only in its infancy. The country has all the necessary technical equipment to establish a functional system of electronic governance. The main challenge is the insufficient digital literacy of citizens and civil servants [6].

A recent national OMNIBUS public opinion survey showed ordinary Ukrainian citizens are not very aware of the possible benefits of e-government and e-democracy initiatives: 86% did not understand what e-government means, 79% have never heard of the term e-democracy and only 41% thought that they may have some idea of the term's meaning [26].

Ukraine should use its IT as a socio-economic driver for the knowledge economy transformation. Ukraine's 402 universities and colleges annually produce more science graduates than many reputable hi-tech countries in Asia and Western Europe. Ukraine's 90,000 IT professionals is the largest professional IT community in Europe with the numbers expected to rise to over 200,000 in 2020 [26]. So, Ukrainian government just should use this resource in the appropriate way.

Republic of Moldova has better situation with ICT development than Ukraine. The current ICT market in Moldova is primarily in a buildout phase, with major investments focused on basic hardware infrastructure, such as server, storage, infrastructure software, and network equipment implementations. In 2016 Moldova takes 51st position by the ICT indicator in GII Report (Table 4).

Moldova has one of the best-wired Internet connections in the world as well as one of the cheapest in terms of price per Mbit. The overall infrastructure is well developed which allows many users to

experience good quality services throughout the country. However, despite high speeds and cheap prices, the penetration level is quite low when compared with many EU or CIS countries [12].

Index	2012	Δ 2013-2012	2013	Δ 2014-2013	2014	Δ 2015-2014	2015	Δ 2016-2015	2016
ICTs	56	6↑	50	8↓	58	10↑	48	3↓	51
ICT access	55	1↑	54	1↓	55	0↔	55	2↑	53
ICT use	57	2↑	55	19↓	74	17↑	57	4↓	61
Government's online service	61	0↔	61	1↓	62	3↓	65	5↑	60
E-participation	38	0↔	38	0↔	38	2↑	40	0↔	40

Table 4: ICTs for Moldova

Source: composed and calculated by the authors on the basis of [21; 22; 23; 24; 25]

The Republic of Moldova achieved significant progress in the implementation of information society technologies, ICT contribution share to GDP in recent years has reached the level of almost 8-10%, every second citizen is an Internet user, more than half of households have at least one computer, the majority of connected households have access to broadband Internet, the biometric passport, the ID card with electronic signature, the e-Statements system and digital map were implemented, country joined the "Open Government Data" initiative, etc. However, in international classifications the country is not placed among the advanced economies in this field, and the level and speed of information society development do not meet the current international environment requirements, in which the world is becoming even more "hyperconnected" and more digitized [8].

The regulatory framework in ICT field is more or less functional and partial harmonised with European norms. The Government of the Republic of Moldova has recognized the need to use ICT as a crosscutting enabler of sustainable growth, competitiveness and improved governance, and in this context, it has requested the World Bank's assistance to enable the e-transformation of Moldova. The Governance e-Transformation Project is designed to increase efficiency and quality of a selected range of public services to citizens and businesses and improve management of ICT in the public sector [17]. E-Transformation Strategy (from 2011) is a logical continuation of actions undertaken beginning with 1990 (when was started the institutional framework) and 1993 (start of the legal and methodological framework development) and later 2005 when was implemented the National Strategy for Information Society Action Plan „Electronic Moldova".

Among other initiatives, within e-Transformation project a unique platform (servicii.gov.md) for public services provided by the authorities was launched in 2012. The servicii.gov.md platform functions as an electronic catalogue for public services provided by the authorities dedicated to citizens and the business environment. The main purpose of this platform is to offer brief, correct, accessible and complete information on the public services available in the Republic of Moldova. On the platform, can be found information regarding both electronic services, as well as traditional services. Currently, there are 566 services on the portal, of which 125 are e-Services (on-line services) with data opened for access [15]. The Republic of Moldova Government is determined to transform all traditional counter services into e-services by 2020, through the „Open Government action plan" and the „Government technological modernisation strategy". In this way, the citizens will be able to access over 500 e-services.

Referring to e-participation the Moldavian government launched in 2012 the "particip.gov.md" platform. Through this platform citizens can be consulted on various draft laws. Until now almost 2500 drafts of Government Decisions, 775 Law drafts, 170 strategies, 115 Regulations and 300 other draft policies were published for large consultation on the platform.

Talking about IT tools in public sector, it should be mentioned the pilot-project Management System of Documents and Authorities Registrations (SIGEDIA) that is part of the Action Plan for the initiative implementation "Paperless Government" in Moldova, approved through Government Decision no. 262 from 15.04.2013. Through SIGEDIA, the electronic circulation of the documents inside the Government is much more reliable, the system replacing the huge amount of paper that was being used in the executive with electronic documents. The electronic documents used by the ministries have the same juridical power as the ones on paper. Another provision of this project requires clerks to use professional email addresses (gov), so that the use of multiple public communication platforms would be eliminated. The system "sigedia.gov.md" was implemented in the State Chancellery and 7 ministries [19].

The rise in demand for exports in manufacturing, the growing usage of IT in the finance sector, transformations in the telecommunications industry, and demand in the government sector will fuel IT services market growth. Since the public sector (government administration, defence, police, judiciary, healthcare, education, and state-owned public enterprises) accounts for the bulk of IT spending in Moldova, it is crucial for IT vendors to be proactive in their dealings with this vertical market. This means educating policymakers and civil servants in decision-making positions in particular, conducting marketing studies and benchmarking, and organizing conferences, as well as offering attractive financial arrangements, outsourcing, and more. Current and future investments in Government IT will represent the main driving force in the Moldovan IT Services market in the near future [28].

4. Conclusions

In the long term, the IT services market of Moldova is expected to be driven primarily by large government projects, such as new e-government initiatives and technology investments in highly competitive sectors (e.g., banking and telecommunications) and initiatives that support the alignment of IT with business goals. The Moldovan government is expected to continue to upgrade public infrastructure, and remain committed to e-government initiatives aimed at improving the quality of public services [28] countrywide.

Ukraine has less developed ICT sphere than Republic of Moldova. Ukraine has the potential to do much more in modernizing its public administration system and in utilizing domestic human capital in the ICT sphere. Ukrainian government should change its attitude to the country's human capital as a resource to export, but has to consider the ICT sphere's human capital also as a key resource to strengthen the public sector of the state.

5. References

[1] Academy of Sciences of Moldova. The Knowledge Triangle in Moldova. Chisinau, 2016. Available at: http://www.ase.md/files/proiecte/fktbum.pdf accessed on 14.12.2016

[2] BAZHAL IU, M.: Knowledge economy: theory and public policy (Znannieva ekonomika: teoria i derzhavna polityka). Ekonomika i prognozuvannia 2003 Nr 3, pp. 71–86.

[3] Council of Europe Office in Ukraine. Strengthening Information Society in Ukraine. Available at: http://www.coe. int/en/web/kyiv/41 accessed on 27.12.2016.

[4] Emelyanenko L. M.. Synergetic approach in the methodology of managing the economic development of Ukraine (Synergetychnyj pidkhid v metodologii upravlinnia ekonomichnym rozvytkom Ukrainy). Visnyk Lvivskogo universytetu. Seria ekonomichna. Issue 51, 2014, pp. 32-40.

[5] European Commission: Ukraine joins Horizon 2020 to work with EU in science and research, 2015. Available at: http://europa.eu/rapid/press-release_IP-15-4640_en.htm accessed on 27.12.2016.

[6] EU in Ukraine: E-governance in Ukraine: challenges and opportunities, Cooperation News, 2015. Available at: https://euukrainecoop.com/2015/06/02/e-gov/ accessed on 28.12.2016.

[7] FEDULOVA, L. I. and Kotneeva, T. M.: Features of the knowledge economy in the modern phase of development of society. Theory and practice of building in Ukraine. (Osoblyvosti ekonomiky znan na suchasnij fazi rozvytku suspilstva. Teoria i praktyka rozbudovy v Ukraini.). Aktualni problem ekonomiky i praktyky. Nr 4, Vol. 106, 2010, pp. 74–86.

[8] Government of the Republic of Moldova: National Strategy for the development of information society „Digital Moldova 2020", Decision no. 857 from 31.10.2013. Available at: http://www.mtic.gov.md/sites/default/files/transparency/public_consults/hg_857_31_10_2013_nationalstrategymoldovadigitala2020en.pdf accessed on 14.12.2016.

[9] HEYETS, V. M.: Character of transition processes to knowledge economy (Kharakter perehidnykh protsesiv do ekonomiky znan). Ekonomika Ukrainy, 2004 Nr 4, pp. 4-14; Nr 5, pp. 4-13.

[10] HIEMSTRA, J.: E-declaration is a real breakthrough in Ukrainian reforms, 2016. Available at: http://www.ua.undp.org/content/ukraine/en/home/ourperspective/ourperspectivearticles/2016/10/31/e-declaration-is-a-real-breakthrough-in-ukrainian-reforms.html accessed on 28.12.2016.

[11] Innovation Union Scoreboard (IUS): The Innovation Union's performance scoreboard for Research and Innovation, 2010. Available at: https://ec.europa.eu/research/innovation-union/pdf/iu-scoreboard-2010_en.pdf accessed on 10.12.2016.

[12] Internet in Moldova. Wikipedia. Available at: https://en.wikipedia.org/wiki/Internet_in_Moldova accessed on 14.12.2016.

[13] Organization for Economic Cooperation and Development (OECD): OECD Science, Technology and Industry Scoreboard, 2005. Available at: http://www.oecd-library.org/docserver/download/9205071e.pdf?expires=1481630258&id=id&accname=guest&checksum=57B44E4958023D428F1BC2E0215BD7C4 accessed on 10.12.2016

[14] PĂCEŞILĂ, M: The impact of moving to knowledge based economy in the public sector, 2006. Available at: http://www.mnmk.ro/documents/2006/2006-14.pdf accessed on 28.12.2016.

[15] Public services platform of Moldova. Available at: https://servicii.gov.md/ accessed on 14.12.2016.

[16] RABOTA YU, I.: Public Relations as Public Administration Institute (Zv'jazky z gromadskistiu jak instytut derzhavnogo upravlinnia) : PhD Thesis on public management. Kharkiv, 2006, p. 20.

[17] Report on e-Transformation project 2015, Moldova. Available at: http://www.egov.md/en/transparency/reports/governance-e-transformation-project-moldova-report-period-2013-2015 accessed on 20.12.2016.

[18] SIBIRIAKOV, S.: Communication practices in public management in context of the information society development (Komunikatyvni praktyky u derzhavnomu upravlinni v konteksti rozvytku informatsijnogo suspilstva), Derzhavne upravlinnia, 2010. Available at: http://www.nbuv.gov.ua/portal/soc_gum/Pubupr/2010/2010-34/doc/1/16.pdf

[19] SIGEDIA - electronic document management system for Central Public Administration of Moldova.. Available at: http://www.egov.md/en/projects/sigedia accessed on 20.12.2016.

[20] TADROS, M.E.: The Arab Gulf States and the Knowledge Economy: Challenges and Opportunities, 2015. Available at: http://www.agsiw.org/wp-content/uploads/2015/07/Tadros_Knowledge-Economy_Rev1.pdf accessed on 24.12.2016.

[21] The Global Innovation Index 2012, Stronger Innovation Linkages for Global Growth. Available at: https://www. global innovationindex. org/userfiles/file/gii-2012-report.pdf accessed on 12.12.2016.

[22] The Global Innovation Index 2013. The Local Dynamics of Innovation. Available at: http://www.wipo.int/edocs/ pubdocs/en/economics/gii/gii_2013.pdf accessed on 12.12.2016.

[23] The Global Innovation Index 2014. The Human Factor in Innovation. Available at: http://global-indices.insead. edu/gii/documents/GII2014report.pdf accessed on 12.12.2016.

[24] The Global Innovation Index 2015. Effective Innovation Policies for Development. Available at: https://www. globalinnovationindex.org/userfiles/file/reportpdf/GII-2015-v5.pdf accessed on 12.12.2016.

[25] The Global Innovation Index 2016. Winning with Global Innovation. Available at: https://www.global innovationindex.org/gii-2016-report accessed on 12.12.2016.

[26] TOMKOVA, J.: How Is Ukraine Advancing In E-Government And E-Democracy? 2016. Available at: http://odessare view.com/ukraine-advancing-e-government-e-democracy/ accessed on 28.12.2016.

[27] UNESCO: Towards Knowledge Societies, 2005. Available at: http://unesdoc.unesco.org/images/0014/001418/ 141843e.pdf accessed on 11.12.2016.

[28] USAID CEED II Moldova and GIZ GmbH. 2014. Competitiveness Assessment of Moldovan IT Services Industry. November 2014. Available at: http://www.mtic.gov.md/sites/default

/files/staticdocuments/competitiveness-assessment-of-moldovan-it-services-industry.pdf accessed on 14.12.2016.

[29] Webster F. Theories of the information society. 3rd ed. Taylor & Francis Group. Routledge. 2006, 323 p.

[30] World Bank Institute (WBI) 2007. Building Knowledge Economies. Advanced Strategies for Development. Available at: http://siteresources.worldbank.org/KFDLP/Resources/461197-1199907090464/BuildingKEbook.pdf accessed on 11.12.2016.

[31] World Economic Forum: The Global Information Technology Report. (WEF GITR) 2015. Available at: http://www3.weforum.org/docs/WEF_Global_IT_Report_2015.pdf accessed on 11.12.2016.

Digital Divide II

How is technology changing the World landscape? A view over the European continent.

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Abstract
We are used to look at geographical, economic, political or even religious maps of our planet. Cybernetics, which is a relatively new science that forcedly makes its way through already existing sciences, it is creating its own map. Obviously, despite the young age, its complexity does not permit detailing of each component. This article focuses on the digital divide on the European continent. Starting from an analysis on local communities in Romania from 2010 up till now, the intention to extend the study to the entire region and then to the whole continent did not take long to appear, but unfortunately the complexity and lack of resources are proving to be a great barrier. In spite of this, we analysed at a national level (using a series of criteria proposed by the ECDL Foundation, together with those proposed by UNESCO and adapted according to the literature studied) all European countries, which possess as we know, important similarities and differences related to their political, social, and economic contexts. As a result, we created a map of the level of information technology's adoption amongst population. The research question this study investigates is how contextual features serve to influence the adoption of technology among different countries in Europe – focusing in particular at Romania. Due to the fact that high dispersion of results for indicators within the same country raises many questions, we conclude saying that the success of IT&C projects is to a large extent contingent upon political and economic contexts, while being less related to social contexts. The article also wants to be a scientific debates initiator, whose purpose is to present, in a formal framework: university courses, conferences, seminars, solutions and strategies of increasing the value of the indicators in question.

1. Introduction

Nowadays, the globalization and economic competition should make governments to prioritize education – in all of its aspects: quality, equal opportunities for everybody and lifelong learning. Experts and policymakers are agreeing on the fact that Information and Communication Technology (ICT) helps people around the world to compete, despite the geographical borders, by adding new skills to each learner. Moreover, they emphasize the fact that ICT is a multiplier factor for both educators and learners. On one hand, the educators will decrease their expenditure associated with traditional instruction and they improve themselves by an easy access to other trainings and, on the other hand, the learners get new skills and they might get in contact with teachers virtually even if they are living in rural areas.

Beyond all that, there are few questions on the issue of the usage of Information Technology, most of them related to the learning achievements as well as to the ease of retention. Some researchers believe that computers might change the teaching and learning environment [1], [2], [3], while others are saying that all that matters is the pedagogy and the ICT is only providing a way to deliver

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the information from teachers to learners [4]. However, the impact of ICT in education is clear and by that we emphasise the importance of integrating it all-over Europe.

2. ICT in education

Education experts, along with policymakers, are trying for decades to include ICT on the educational reforms around Europe – both at the national level as well as for the entire EU. At the European level, Council of European Professional Informatics Societies (CEPIS) is drawing policies for integrating ICT everywhere, including education. Having as a goal "to promote the development of the Information Society through digital literacy, skills, education & research and professionalism" [5] CEPIS task force creates in 1995 the European Computer Driving Licence (ECDL) concept, supported by the European Commission through the ESPRIT research programme, "to examine how to raise the levels of digital literacy throughout Europe" [6]. Moreover, by its mission, it is undoubtable that ICT is seen as a way to eliminate exclusion and to improve the quality of life.

Even though we assist to this growing demand for information technology in the educational sector, most of the statistics lack basic information about the policies [7]. The European Commission is not providing proper indicators to measure the inputs and outputs from ICT investments in education – however, datasets regarding students and their performance (regarding ICT) are available.

Unfortunately, to the authors' knowledge, the data available are focused on pupils, students and other learners that are enrolled in the educational system; but there are others, that are not. According to Eurostat "digital divide refers to the distinction between those who have Internet access and are able to make use of new services offered on the World Wide Web, and those who are excluded from these services." [8]. Therefore, beyond the available statistics, there are other categories of people who are not in contact with technology.

3. Methodology

Digital divide might be measured by technical indicators, as some researchers are doing it: *Mobile cellular telephone subscriptions*, *Internet users*, *Fixed telephone lines*, *Mobile broadband subscriptions*, *Fixed broadband subscriptions* and so on [9], but we assume that beyond the digital divide there are strong financial factors that should be taken into consideration as well as social factors and education policies – how much money the government invest in education, for example. Of course, ample research has already investigated the extent to which certain factors are influencing the digital divide (like GDP-ICT penetration relationships or even education and ICT use); however, to the authors' knowledge little research has attempted to understand what conditions should be present for reducing it.

The most significant obstacle in collecting the data was the huge variety of sources – not all of them providing the same figures. Although, the differences were not significant, we took into consideration the sources mentioned below because they clearly provide the most accurate and up to date figures by being well known international organisations and by that, we assume they are trustable.

Therefore, in this article we looked over statistics made on all twenty-eight European countries by UNESCO Institute for Statistics, Council of European Professional Informatics Societies (CEPIS), Internet World Stats, EMEA Satellite Operators Association (ESOA) by their program *Broadband*

for all and European Commission by the *Digital Single Market* and *Digital Agenda* scoreboards. The intention is to explore the relationships between economic and social context and the ICT penetration, considering this as being factors that influence the adoption of technology among different countries in Europe [10], [11] – paying a special attention to the Romanian case.

Firstly we looked at the GDP – to have an overall image over the countries, and GDP per capita to better understand the differences among them and then, we had a look at the state investments in the field of education (as percentage of GDP) and in Research and Development (GERD - Gross domestic expenditure on R&D) in the area of Engineering & Technology.

Secondly, but very important in terms of comparison, we looked for the number of Internet users as percentage of population and if they access the global network by a high-speed connection (Broadband).

At the end we draw maps of Europe, highlighting the differences we found, trying to see if, by overlapping them, there are any correlations among the indicators. We must add here that all of the European nations possess important similarities and, of course, differences related to their political, social, and economic contexts. In addition, little to none of the European nations possesses a similar timeline with regard to the evolutions of their democracies, which makes comparisons of ICT use in each of them particularly interesting.

4. Results

The existence of data, collected systematically by different organisations, helps researchers to find correlations among them. However, the figures must be understood in the local / national context. In many countries the integration of ICT is not the main priority of the local government compared to other objectives, including infrastructure investment - Romania and Bulgaria is lacking on highway infrastructure for example [12], or ensuring an adequate number of doctors per thousand inhabitants and so on [13].

In the table below, we present the figures we found by searching the open data bases from the organisations we had in focus for this article.

	Country (year of entry)	GDP in billions - PPP$	GDP per capita - PPP$	Government expenditure on education as % of GDP	GERD as a % of GDP	GERD - Engineering & Technology	Internet Users % Population	Broadband % Internet Users	Digital Skills (Basic)
1	Austria (1995)	412	47,824	5.56%	2.98%	NA	83.10%	99.00%	73.90%
2	Belgium (1958)	496	43,992	6.38%	2.46%	NA	85.00%	100.00%	66.00%
3	Bulgaria (2007)	126	17,512	4.07%	0.79%	23.70%	56.70%	90.00%	54.80%
4	Croatia (2013)	92	21,880	4.59%	0.81%	41.13%	75.00%	94.00%	52.60%
5	Cyprus (2004)	26	30,734	6.44%	0.40%	25.44%	95.00%	100.00%	55.10%
6	Czech Republic (2004)	339	32,167	4.11%	1.99%	50.17%	79.70%	98.00%	66.20%
7	Denmark (1973)	265	46,635	8.61%	3.08%	4.63%	96.00%	98.00%	58.40%
8	Estonia (2004)	37	28,095	4.82%	1.43%	9.12%	84.20%	88.00%	72.90%
9	Finland (1995)	223	40,601	7.16%	3.17%	NA	93.50%	93.00%	72.50%
10	France (1958)	2,651	39,678	5.51%	2.25%	NA	83.80%	99.00%	72.10%
11	Germany (1958)	3,848	47,268	4.94%	2.86%	NA	88.40%	97.00%	74.80%
12	Greece (1981)	289	26,680	NA	0.83%	39.88%	63.20%	99.00%	63.50%
13	Hungary (2004)	252	25,582	4.23%	1.37%	53.89%	76.10%	92.00%	61.30%
14	Ireland (1973)	254	54,654	5.34%	1.51%	NA	82.50%	97.00%	59.70%
15	Italy (1958)	2,183	35,896	4.17%	1.28%	NA	62.00%	98.00%	70.90%
16	Latvia (2004)	48	24,286	4.91%	0.69%	34.00%	82.00%	83.00%	62.50%
17	Lithuania (2004)	81	27,730	4.61%	1.01%	15.15%	82.10%	97.00%	62.10%
18	Luxembourg (1958)	58	101,926	4.14%	1.20%	NA	94.70%	100.00%	79.50%
19	Malta (2004)	13	29,526	8.29%	0.84%	29.56%	73.20%	100.00%	65.70%
20	Netherlands (1958)	821	48,459	5.61%	1.90%	41.47%	95.50%	100.00%	69.50%
21	Poland (2004)	993	26,135	4.94%	0.90%	52.88%	67.50%	69.00%	65.00%
22	Portugal (1986)	302	29,214	5.28%	1.20%	41.56%	67.60%	100.00%	65.90%
23	Romania (2007)	424	21,403	2.95%	0.38%	42.25%	56.30%	87.00%	35.60%
24	Slovakia (2004)	157	28,877	4.11%	0.88%	48.76%	83.10%	75.00%	67.70%
25	Slovenia (2004)	64	31,122	5.49%	2.38%	53.66%	72.80%	74.00%	66.70%
26	Spain (1986)	1,603	34,527	4.30%	1.23%	NA	76.90%	98.00%	65.90%
27	Sweden (1995)	455	46,420	7.72%	3.10%	NA	94.60%	99.00%	64.30%
28	United Kingdom (1973)	2,692	41,325	5.75%	1.70%	5.23%	91.60%	100.00%	72.10%

Table 1: A view over the European countries regarding the GDP per capita and the number of Internet users
Source: UNESCO Institute for Statistics, Internet World Stats and ESOA, European Commission (2016 figures)

As we can see, regarding the GDP per capita (in PPP$ - Purchasing Power Parity, as we found it on UNESCO Institute for Statistics) – we have to mention here that we used for this study the latest of the statistics provided by each organisation (2016) the values for the European countries are widely spread, starting from the highest level – Luxembourg with 101.926 PPP$ per capita, all the way down to Bulgaria with a GDP per capita approximately six times lower (17.512 PPP$). Furthermore, even thought is not our main focus for this article, we were looking at the correlation between the number of years since a specific country is a European Union member and the GDP per capita. We found that the correlation is positive and very strong (Pearson correlation coefficient, *r*, being 0.651). We see this as a very important contextual factor that contributes to the success or failure of the digital divide policies among European countries.

According to the table below (Table 2.), beside the correlations we have mentioned above, between the number of years since the European countries acceded EU and GDP per capita (r = 0.651) the next strongest correlation is between GDP per capita and the number of Internet users – being r = 0.584. If we take into consideration that the Educational expenditure is correlated with the number of Internet users by r = 0.530, we might think that the policymakers should pay attention more on the education (especially on the field of ICT) in order to contribute to the social category of factors. This statement is strengthened by the very weak correlation between the Internet users and the Digital skills indicator which: r = 0.064.

What the above discussion suggests is that for the social factors to contribute to the success of digital divide policies, other factors should be take into consideration as well – such as contextual factors.

		Years in EU	GDP per capita	Education expenditure	GERD from GDP	GERD in E and T	Internet users	Broadband	Digital skills
Years in EU	r =	1	.651(**)	.135	.390(*)	-.287	.330	.507(**)	-.099
GDP per capita	r =	.651(**)	1	.158	.386(*)	-.317	.584(**)	.387(*)	-.186
Education expenditure	r =	.135	.158	1	.527(**)	-.449	.530(**)	.311	.076
GERD from GDP	r =	.390(*)	.386(*)	.527(**)	1	-.180	.535(**)	.236	-.052
GERD in E and T	r =	-.287	-.317	-.449	-.180	1	-.432	-.451	-.279
Internet users	r =	.330	.584(**)	.530(**)	.535(**)	-.432	1	.323	.064
Broadband	r =	.507(**)	.387(*)	.311	.236	-.451	.323	1	.278
Digital skills	r =	-.099	-.186	.076	-.052	-.279	.064	.278	1

Table 2: Correlation between the data sets indicators presented in Table 1

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

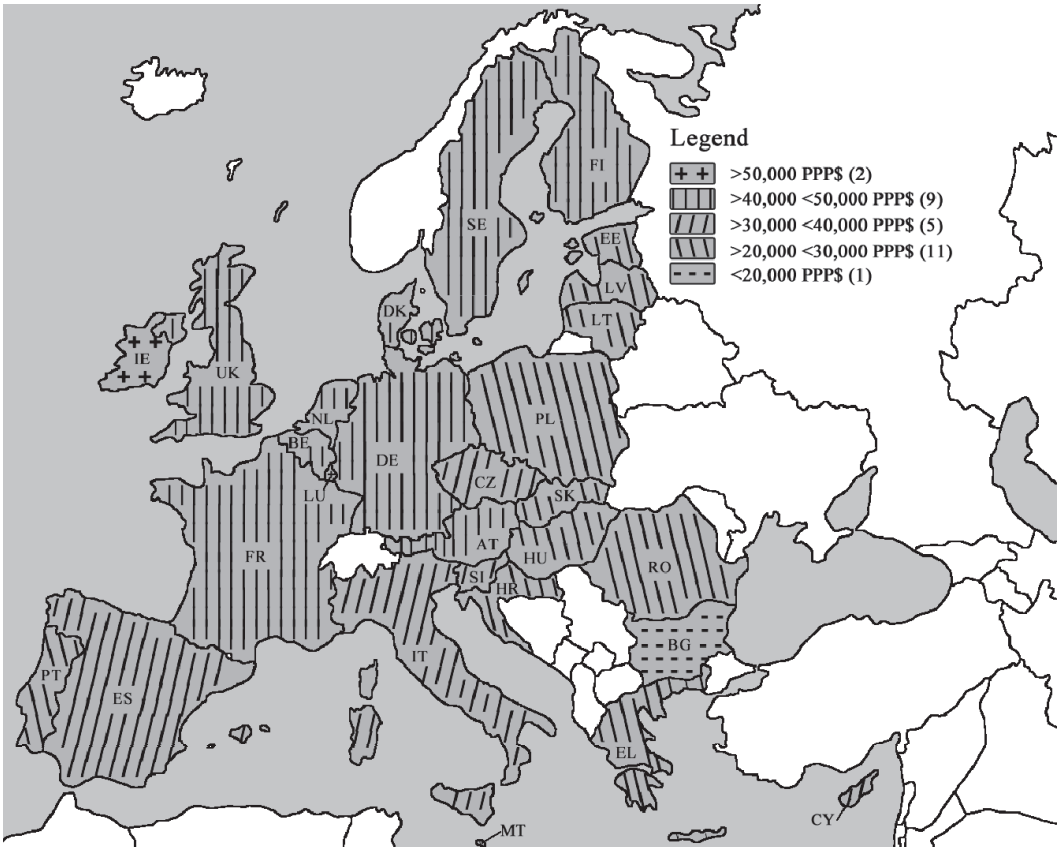

Figure 1: European countries by GDP per capita

On the map above, we can see all twenty-eight European countries by GDP per capita in PPP$ mentioning that France, even though the value for it is 39,678 PPP$, so below 40.000 PPP$ (as on the legend), is has been placed on the upper interval due to the prognoses made by statisticians from UNESCO.

What it is easy to see is the fact that with one exception – Portugal, all of the countries with a value for GDP per capita situated below 30,000 PPP$, are located in Eastern Europe, while all the others are located in Western and Northern part of Europe. An ample body of literature has explored the way in which certain features of an environment influence the sustainability of ICT investments, some taking into consideration the political, social, and economic aspects in such a way that the readers might believe that all of the European countries possesses similar timeline in regard to the evolutions of their democracies. Consequently, it is important for researchers to specify which contextual factors influence the digital divide degree found among the European countries, rather than aggregate data and general level. However, this article is not focusing on the causes for this segregation; we believe that economists and experts in social sciences are already having the answer for this – we only provide a map with the current situation.

Going further on with our research, we made a different map, this time showing the number of Internet users as percentage from the total number of inhabitants.

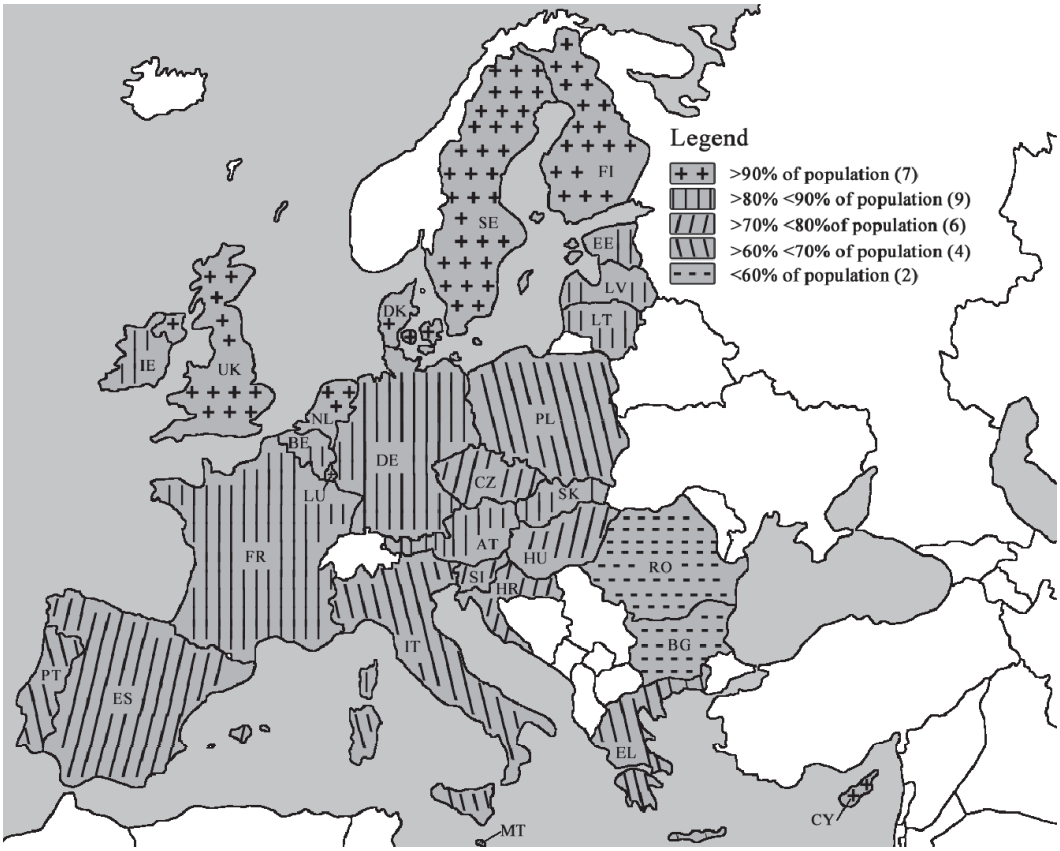

Figure 2: European countries by Internet users

Overlapping those two maps, we can see that twelve countries (43% of the total number of European countries) are perfect match; those are Austria, Belgium, Bulgaria, Czech Republic, Finland, France, Germany, Luxembourg, Poland, Portugal, Slovenia and Spain. As previously demonstrated by the use of SPSS, there is a strong positive correlation in those two sets of data as well – Pearson correlation coefficient, *r*, being 0.584 between GDP per capita and the number of Internet users as percentage from the total number of inhabitants.

The data specified in the last column of the Table 1. – presenting the connection speed for the Internet users (broadband) shows, with very few exceptions, that high Internet speed connection is available all over Europe no matter the GDP or any other indicators we took into consideration for this study.

While correlating the expenditure for education as well as expenditure in Research and Development in the area of Engineering & Technology with the number of Internet users, we found that *r* is 0,530 in the first case – showing a medium positive correlation, and -0.432 in the second case – medium negative correlation. That means education must come first. Even though the country is investing in expensive IT solution for people, if they are not prepared to face the technology, the projects fail in achieving their goals.

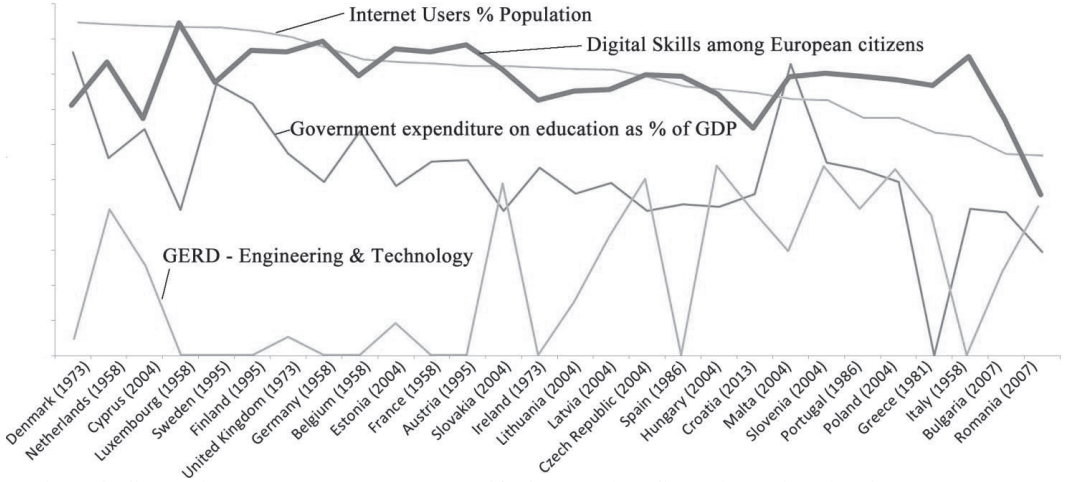

Figure 3: Comparison between Internet users as % of Population, GERD in Engineering & Technology and Government expenditure on education as % of GDP and Digital skills among European citizens

We have to mention here that ten countries did not provide any data about GERD - Engineering & Technology chapter for UNESCO Institute for Statistics; therefore this correlation might not be very accurate.

On the following map (Figure 4.); we present Europe seen by the number of users with basic digital skills [14]. As we can see from it as well as from the chart presented on the Figure 3., the correlation between the number of Internet users (Figure 2.) and Digital Skills among the European citizens (Figure 4.) is very weak (r being equal to 0.064). That proves the fact that Internet users are not necessary prepared for a proper use of ICT. Therefore, we believe that policymakers should be grounded in today's reality, because they are indeed, the only one who can bring about change – nowadays it looks that there are some issues with the resource alignment to the policies intentions. For example, if we are to speak about Romania, even though it has a fast Internet connection [15], it is still lacking on other criteria such as Internet users and Digital skills, as we saw from the present study.

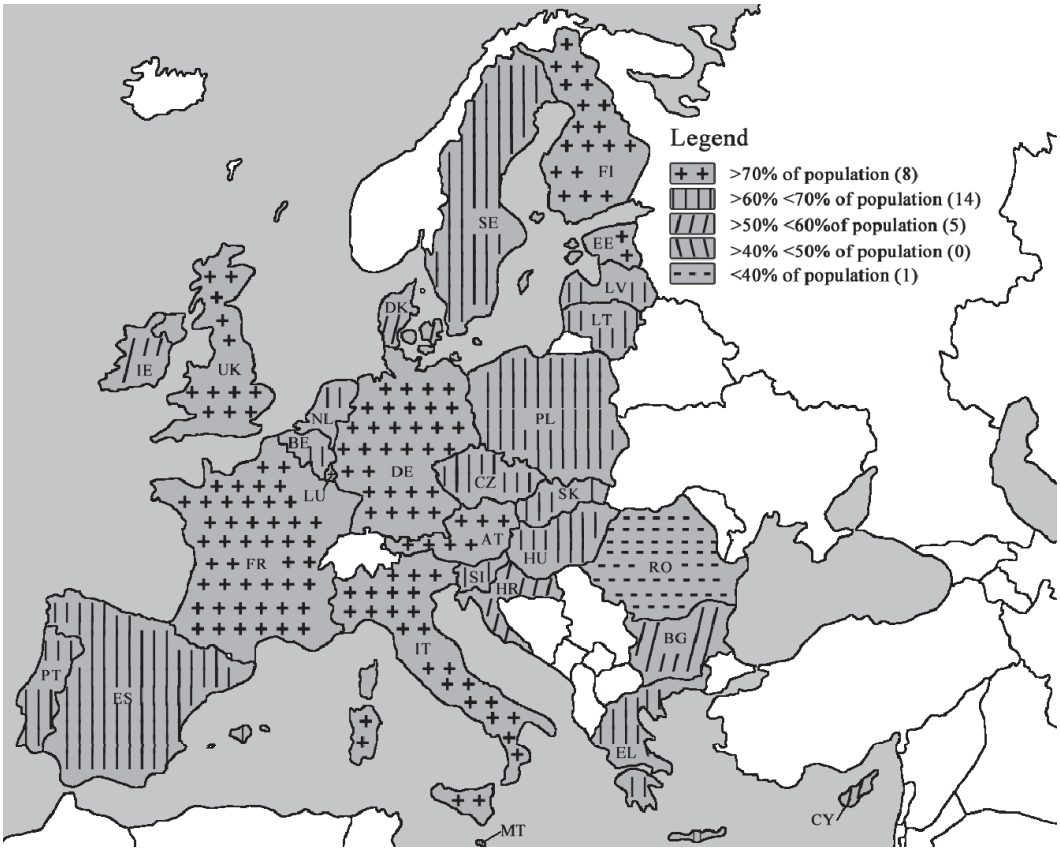

Figure 4: Digital skills in Europe

5. Conclusions and discussions

This research has attempted to provide a view over the European countries for a better understanding of differences among them regarding the ICT sector development as well as, to briefly present some of the conditions toward the viability related policies. At present, literature related to this subject, treated the differences among countries only by looking at the differences in figures and not paying attention to some contextual factor (both external and internal), thereby researchers should focus more upon them then looking on the numbers only.

Following ECDL, in the paper *Perception and Reality: Measuring Digital Skills in Europe* (the study assesses Digital skills and e-literacy in Austria, Denmark, Finland, Germany and Switzerland) we found that people routinely overestimate their abilities [16]. We tend to think that, in Romania at least, policymakers are overestimating citizens as well, and by doing that they don't put too much effort in increasing the level of ICT skills among them.

Some researcher noted that adoption of ICT within a given context is usually seen as contingent upon the prevalence factors related to infrastructure, literacy, income, and perceived needs [17].

ICT Policies and strategies can also fail due to reasons like:

- They are viewed as populist gesture for increasing the political capital [18];
- People from the both sides resist changes that might be seen as imposed [19], [20];
- Unbalanced approaches (e. g. focus on project itself instead of its goals)
- Lack of competences among instructors;
- Unbalanced situations between the resource alignment on one hand and policies on the other [21].

The authors of this study agree that lacks of resources, political interference, and poor policy design or implementation are important reasons of failure for ICT policies – along with, of course, consistency and long term perspectives. That should be taken into consideration on further researches.

Taking into consideration the Romanian case, planning and implementing of the ITC policies are spread across various internal actors – therefore having a single coherent vision is difficult, not to mention that this might bring a lack of consistency as well. The involvement of the European Union, who's serving as a source of pressure, makes it even more complicated because the Romanian officials are focusing more on the projects goals and implementation instead on focusing on the social needs. Given the widespread calls for reducing the digital divide applications, researches addressing successful and less successful applications are needed – in order not to repeat the mistakes made already in the past.

According to the data we took into consideration for this research, only two countries matches perfectly on all the three maps – Belgium and Luxembourg, both of them being very high rated. We might think that only they were consistent in their approach (or it was just by accident – we did not study the political context over years neither in those two countries or anywhere else). However, the correlation we've made should be seen, understood and should be taking into consideration by the policymakers all over Europe. Through such a comparison, it is possible to show differences and similarities between the countries and how these contribute toward to the successful adoption of digital divide applications within the nations.

Beyond the differences, the internal digital-divide on some countries increases rapidly due to the quick adoption of ICT in urban centres versus rural areas. Taking that into consideration, ICT in education should be seen from two perspectives: the first reflects the role of it in providing support to people that cannot access the infrastructure while the other one is regarding the e-learning environment. By the last one, both teachers and the learning process itself is evolving rapidly encouraging collaboration and sharing knowledge.

The findings resulting from such a comparison are fairly intuitive, implying that they should also be easily generalizable to all e-government applications throughout various contexts, ranging from wealth advanced nations to those with fewer resources.

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Further research will bring into the analysis other instruments like *ICT in education*, *e-government*, *the price for Internet connection* and so on, attempting to see if there is any correlation between some indicators already used and those we have just mention.

6. References

[1] TAPSCOTT, D.: Growing Up Digital: The Rise of the Net Generation, McGraw-Hill, 1999.

[2] CARR, N.: The Shallows: What the Internet Is Doing to Our Brains, W. W. Norton, 2010.

[3] BALTAC, V.: Mituri si realitate in lumea digitala [Myths and Realities in the Digital World], Excel XXI Books, 2016.

[4] CLARK, R. E.: Media will never influence learning, Educational Technology Research and Development, 42(2) 1994, pp. 21-29.

[5] CEPIS – Council of European Professional Informatics Societies official Web portal http://www.cepis.org/ (accessed December 2016).

[6] ECDL Foundation official Web portal http://ecdl.org/about (accessed December 2016).

[7] KRUMOVA, M.: Open Data Benchmarking for Higher Education: Management and Technology Perspectives. Smart Cities Conference in Bucharest December 2016. http://administratiepublica.eu/smartcitiesconference/2016/program.htm

[8] EUROSTAT official Web portal http://ec.europa.eu/eurostat (accessed December 2016).

[9] HÎNCU, D., FRĂŁILĂ, L. and TANȚĂU, A.: Gap indicator for measuring digital divide, Management Research and Practice Vol. 3 Issue 2, 2011, pp 74-88.

[10] HRUSTEK, N. Ž., PROSSER, A. and DUŠAK, V.: A Multidimensional Model of E-Inclusion and its Implications, CEE e|Dem and e|Gov Days 2016, Austrian Computer Society, 2016.

[11] MÄNNEL, B.: European eGovernment for a Better Democracy, CEE e|Dem and e|Gov Days 2016, Austrian Computer Society, 2016.

[12] HIGHWAYMAPS.EU official Web portal http://www.highwaymaps.eu/, (accessed December 2016)

[13] EUROSTAT official Web portal Practising physicians, 2009 and 2014 (per 100 000 inhabitants) http://ec.europa.eu/eurostat (accessed December 2016),

[14] EUROPEAN COMMISSION official Web portal, Digital Skills and Jobs Coalition, https://ec.europa.eu/digital-single-market/en/digital-skills-jobs-coalition (accessed December 2016)

[15] ROMANIA-INSIDER.COM media channel: US Presidential candidate Bernie Sanders: Bucharest residents have much faster Internet than most of the US, 2016,

http://www.romania-insider.com/us-presidential-candidate-bernie-sanders-bucharest-residents-have-access-to-much-faster-internet-than-most-of-the-us/166176/

[16] ECDL: Perception and Reality: Measuring Digital Skills in Europe, 2016http://ecdl.org/media/perceptionandreality-measuringdigitalskillsineurope-ecdlfoundationpositionpaper1.pdf

[17] ZANELLO, G. and MAASSEN, P. : Strengthening Citizen Agency and Accountability Through ICT, 2011, Public Management Review, 13(3), 363-382.

[18] SWYNGEDOUW, E.: Apocalypse Forever? Post-Political Populism and the Spectre of Climate Change, Theory Culture & Society 27(2-3), 2010, pp 213-232.

[19] TYACK, D. and CUBAN, L.: Tinkering toward Utopia. Cambridge: Harvard University Press, 1995.

[20] TORBEN, R.: Change is not the problem – resistance to change is the problem, Change Management by Meliorate, 2013, https://www.torbenrick.eu/blog/change-management/change-is-not-the-problem-resistance-to-change-is-the-problem/

[21] BULL, J.W., JOBSTVOGT, N., BÖHNKE-HENRICHS, A., MASCARENHAS, A., SITAS, N., BAULCOMB, C., LAMBINI, C.K., RAWLINS, M., BARAL, H., ZÄHRINGER, J., CARTER-SILK, E., BALZAN, M.V., KENTER, J.O., HÄYHÄ, T., PETZ, K. and KOSS, R.: Strengths, Weaknesses, Opportunities and Threats: A SWOT analysis of the ecosystem services framework. Ecosystem Services Volume 17, pp. 99–111.

CIVIC ENGAGEMENT IN A DIGITAL TIME – IS THERE A DIVIDE IN TERMS OF SOCIAL CIVIC BEHAVIOR?

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Abstract
ICT's and social media dramatically reshape the way citizens communicate and get involved into the civic life of a city and country. As a consequence of these developments, we would expect people to be more engaged citizens, active participants in both their online and offline communities. However, two questions arise: do people actually become more civic minded due to the digital evolution? Does social involvement in online virtual communities translate into real life actions? Answering these questions is the aim of the present study, which intends to analyze if there is a divide in terms of social civic behavior on two axes – attitude towards civic engagement and stated civic participation, online and offline behavior. We used survey as main research method in order to answer our research questions, and the study is a descriptive one. The investigated population consisted of a purposive sample of internet users from cities with possible different degrees of civic attitude (measured through a classical Civic Engagement Scale).

Key words: *civic engagement, civic attitude, offline and online civic participation, stated civic behavior.*

1. Introduction: context and theoretical background

The starting point of our study was the increasing importance of civic values and civic participation for the modern economy and society. The huge importance of people's involvement in all aspects of economic and especially societal life, through various civic actions, was recognized through the development of new models, like the quadruple helix, in which civism plays a major role: industry – academic environment – government – civil society [32], [33]. The civil society can act as catalyst, accelerator, guardian and helmsman, at the same time, leading to synergic effects between all economic and social actors. The social capital obtained through civic participation produces economic growth effects, as previous research showed [44], and leads to new participatory models [42], to the development of the field of various and complex civic services [10] and to a new type of economy, something that can be labeled a real "economy of engagement" [25]. In such a civic engaged economy, new mechanisms of communication and participation can change the way in which the entire society functions. Although it might sound like a big word, this change can be dramatic, as noticed by Kleinhans, van Ham and Evans-Cowley [30], when they refer to the organized demonstrations in Egypt (the Arab Spring) or those of riots in London and Manchester, 2011. Not at all less dramatic were the demonstrations against corruption organized in Bucharest and several other big Romanian cities, in January – February 2017. All these manifestations have in

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common ICTs and social media as powerful tools for citizens' quick mobilization and self-organization.

Civic education and civic engagement lead to youth empowerment and long term positive effects on various economic and social issues – wellbeing, intelligence, creativity and innovation, democratic values and behavior, happiness – and all these contribute to personal growth and economic development [1], [2], [3], [14], [28], [31]. Participation and civic engagement are associated with psycho-sociological wellbeing, social intelligence, social innovation, democracy supportive behaviors or happier societies [14], [15], [25], [36], [41], [46]. Effects are found on various levels - academic, personal, social and citizenship level outcomes [8]. All these lead, in the end, to a better quality of life, as a terminal or end value, through a simple mechanism similar to that described by Zanoli and Naspetti [49] for something very pragmatic, like organic food. For example, if we get involved in civic issues, we can fight for concrete attributes, like school abandon, get to abstract attributes, such as better educated people or better democracy, obtain functional competences or consequences, such as ability for continuous learning or ability to understand societal issues; one step further, this leads us to psycho-social consequences, like feeling good, and then to obtaining instrumental values, such as own physical and mental health, translated finally to a higher quality of our life.

Numerous factors influence civic engagement, at both individual and social group level. Some of the previous studies focused on personal factors [9], [35], [39], while other analyzed educational or cultural factors [4], [25], [39], [48]. Among all these factors, social media seem to have a significant impact on all aspects of life, including societal issues and civic participation [5], [27], [37], [43], [47], [50]. Although the effects of internet and social media on civic engagement and participation are mostly positive, not all dimensions of internet use are linked to civic engagement [37], and there might be thresholds in internet use – as previous investigators noticed, the time spent online has the potential to actually erode social capital [43], thus having a negative effect. The relationship between democracy and Internet is controversial [6], but Internet could become a less coerced public sphere and a place for fruitful debates, despite inherent risks of fake news or manipulation. Social media seems to play a very important role especially for cynics and skeptics [5], who rely more on citizen generated news, specific for social networks.

Encouraging and supporting civic attitudes and engagement seem an undisputable desiderate. However, the positive civic attitude is not enough, because positive attitudes towards civic engagement do not necessarily translate into real life actions – real civic behavior. There is a rather normal human gap between attitude and behavior [38], [45]. Efforts for measuring civic attitude, civic competence and civic behavior were made, all over the world, and sometimes large differences across countries, persistent in time, were found [21], [22], [23], [34], suggesting that situational factors, besides cultural ones, exercit an influence, as well.

Resuming the logical framework of our study in just a few words, civic attitude and engagement are important present issues; their influence factors need to be known; effects on various economic and social aspects are significant, and large differences are found in different countries; there is a gap between civic attitude and civic behavior, and social media is a common mediator, plays an important role in all these subjects. This is the general context in which our main research questions were raised: Do people become more civic minded due to the digital evolution? Does social involvement in online virtual communities translate into real life actions? Answering these questions is the aim of the present study, which intends to analyze if there is a divide in terms of

social civic behavior on two axes – attitude towards civic engagement and stated civic participation, online and offline behavior.

2. Objectives and methodology

The main objectives of our study were, at this stage, descriptive ones, namely to measure the stated general civic behavior of an Eastern European Country, EU member, to find out potential relationships between online civic engagement (online_CE), offline civic engagement (offline_CE), civic attitude (CEA) and the stated general civic behavior (CEB), to analyze the results and use them for a future explanatory research.

We assume positive relationships between online civic engagement and civic engagement attitude (Hypothesis1), between civic engagement attitude and general civic engagement behavior (Hypothesis 2), as well as between both online and offline civic engagement and civic engagement behavior (Hypotheses 3 and 4): (H1) online_CE → CEA; (H2) CEA→ CEB; (H3) online_CE→ CEB; (H4) offline_CE→ CEB.

Following aforementioned study objectives, as well as literature indications, we developed and tested a research model (fig.1), using structural equation modeling (PLS-SEM method) for data analysis, and a questionnaire based survey administered online on a convenience sample for data collection.

The questionnaire contained 22 items for measuring the four constructs of interest (CEB, CEA, online_CE, offline_CE) as follows: 8 items for measuring CEA - civic engagement attitude and 6 items for measuring CEB - engagement behavior (taken from the Civic Engagement Scale of Doolittle and Faul, [12], as well as 3 items for measuring the stated offline civic engagement (offline_CE) and 5 items for measuring the stated online civic engagement (online_CE) adapted from the Online Civic Engagement and Offline Civic Engagement scales of Jugert et al. [27]. Although Jugert et al have used larger scales for offline and online civic engagement, after carefully analyzing the items and talking to 3 experts, we decided to clearly separate online and offline based on the final civic action, not on the channel of information or transmission; from this perspective, for example, money donations or volunteering can be done both entirely or partially offline and online. Therefore, we retained only two items specific for entirely offline and added an item which separated respondents in NGO members and non-members. Also, on the online civic engagement we added one item for measuring the stated perceived easiness of online versus offline civic participation. To these items we added profile questions and demographics: type of social network used, place of residence, gender, age, civil status, revenue, work experience and field of studies.

The 8 items for CEA - civic engagement attitude were *I feel responsible for my community, I believe I should make a difference in my community, I believe that I have a responsibility to help the poor and the hungry, I am committed to serve in my community, I believe that all citizens have a responsibility to their community, I believe that it is important to be informed of community issues, I believe that it is important to volunteer, I believe that it is important to financially support charitable organizations.*

The 6 items used for measuring CEB - general civic engagement behavior were: *I am involved in structured volunteer position(s) in the community, When working with others, I make positive changes in the community, I help members of my community, I stay informed of events in my*

community, I participate in discussions that raise issues of social responsibility, I contribute to charitable organizations within the community.

The 5 items for measuring online civic engagement (online_CE) were: *I liked or shared link news, music or video with a social or civic content to my contacts, I discussed societal or civic contents on the net, I participated in online based petition, protest or boycott, I've visited websites of civic organizations, In general, I consider that is easier to participate or support civic actions online than offline.*

Finally, 3 items were used for the offline civic engagement (offline_CE): *I've worn bracelets or any other type of symbol of support for civic and social cases, I've taken part in a physical, offline demonstration, I am (or I used to be) an active member of a civic, non-profit organization.*

All 22 items were measured on Likert type scales with 5 steps. The questionnaire was administered in Romanian, after a content validation process of back translation, in order to ensure the appropriate connotations. We used Google forms for the survey, and the questionnaire was distributed both on Facebook and to a list of e-mails. The data was collected during a week, in January 2017.

3. Results and discussion

We obtained a sample of 217 complete answers, with the following structure of respondents: 27.1 % males and 72.9% females; 73.4% age 18-25 years, 17.4% age 26-35 years; 88.5% higher education degree; 47.7% have been NGO members. The majority of the sample consists of students with a background in economic and social studies. This can be explained by the fact that we used the Facebook accounts of the authors, who are academics and have many former student connections; also, the e-mails were sent to former students, with the kind request of distributing the questionnaire to their friends, as well – we especially targeted youth. Although a convenience or purposive sample, not representative for the whole population, it is a good pilot for our descriptive research.

Complying with PLS-SEM methodology [20] for testing the four assumptions included in the research model regarding the positive effects: (H1) online_CE→CEA; (H2) CEA→ CEB; (H3) online_CE→ CEB; (H4) offline_CE→ CEB, the overall goodness of fit, measurement model and structural model were evaluated, and relationships between variables were reported as outlined in fig.1. Model evaluation indicated the overall goodness-of-fit (GoF), the value of SRMR (SRMR= 0.075) being below the 0.08 limit of Hu and Bentler [24], as recommended for PLS-SEM method.

Also, the measurement model complied to the reliability and validity requirements, all reflective constructs ($\alpha > 0.7$; rho_A > 0.7; CR > 0.8; AVE > 0.5 detailed in Table 1), as well as composite constructs (no collinearity among indicators) fulfilling methodological criteria.

Construct	α	rho_A	CR	AVE
CEA [composite: the sum-scores of the 8 items measuring CEA]	1.000	1.000	1.000	1.000
CEB [reflective: 6 items]	0.867	0.877	0.900	0.602
offline_CE [composite: 3 items]	-	1.000	-	-
-online_CE [reflective: 5 items]	0.838	0.876	0.883	0.605

Table 1: Construct Reliability and Validity

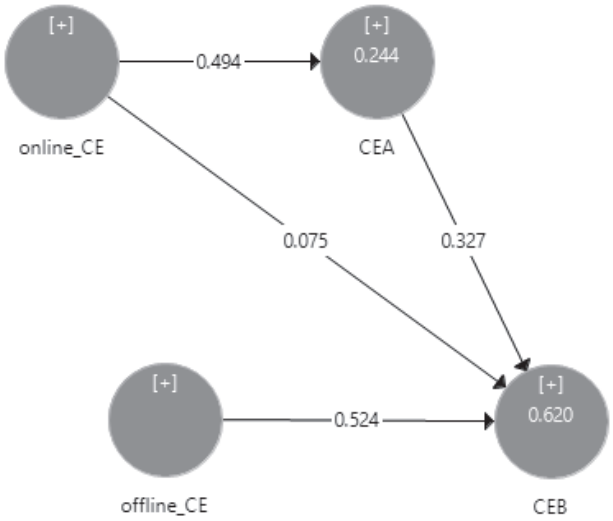

Figure 1: Research model with determination coefficients and path values

As indicated by Diamantopoulos and Siguaw [11], the variance inflation VIF < 3.3 indicated no multicollinearity among latent variables. Discriminant validity criteria of Fornell and Larcker [16] were meet (detailed statistics in Table 2) and HTMT values (Table 3) were below 0.85 as indicated in Henseler et al [19], [20].

Construct	CEA	CEB	offline_CE	online_CE
CEA	**1.000**	-	-	-
CEB	0.605	**0.776**	-	-
offline_CE	0.459	0.723	-	-
online_CE	0.494	0.578	0.652	**0.778**

Table 2: Discriminant Validity: Fornell and Larcker criterion

	CEA	CEB	online_CE
CEA			
CEB	0.645		
online_CE	0.512	0.629	

Table 3: Discriminant Validity: HTMT criterion

Bootstrapping procedure with 5000 re-samples employed for the structural model evaluation indicated that the relationships included in the model explain 62% of CEB variance (R^2=0.620), while 24,4% of CEA variance is explained by online_CE, as observable from Fig.1.

Bootstrapping results (Table 4) indicated the significance of the positive influences that were hypothesized, highlighting 3 direct effects: *online_CE→CEA*; *CEA→ CEB*; *offline_CE→ CEB* (H1, H2 and H4 confirm) and the indirect effect *online_CE→ CEB* (H3 partially confirms).

In the *online_CE→ CEB* relationship, the significance of the indirect effect and the lack of the direct effect highlight the mediator role of CEA, the online civic engagement (online_CE) influencing general civic behaviour (CEB) via civic engagement attitude (CEA), as observable from Table 4 and Figure 1.

Effects	Effect Type	Path coef β	Mean	StDev	T	P	2.5% C.I.	97.5% C.I.
CEA → CEB	direct	0.327	0.325	0.048	6.824	0.000	0.227	0.418
offline _CEA → CEB	direct	0.524	0.529	0.051	10.246	0.000	0.425	0.626
online_CE → CEA	direct	0.494	0.496	0.054	9.087	0.000	0.385	0.597
online_CE → CEB	direct	0.075	0.078	0.059	1.264	0.206	-0.043	0.191
online_CE → CEB	indirect	0.162	0.161	0.030	5.326	0.000	0.105	0.224

Table 4: Direct and Indirect Effects

As results outline, while civic engagement attitude and offline civic engagement are directly influencing civic behavior, the online engagement exerts a direct positive effect on civic attitude which mediates the indirect effect of online civic engagement on civic behavior.

Finally, a multigroup analysis (MGA) employed to control for potential differences that might appear due to participant's demographics indicated no significant influences, highlighting that the presented model holds.

4. Conclusions, limits and further research

Coming back to our research questions and hypothesized relationships, based on the results of the study we can say that people just partially become more civic minded due to the digital evolution, their attitude being affected more than their stated behavior. Although the online civic engagement positively affects the civic engagement attitude, and civic engagement attitude positively affects civic engagement behavior, the online civic engagement attitude has just an indirect effect on online civic engagement behavior. That is, the online civic engagement affects civic behavior only indirectly, through civic engagement attitude (which acts as a mediating variable). This implies that we could use social media and digital instruments in order to increase positive civic engagement

attitudes. Social involvement in online virtual communities partially translates into real life actions. The positive effect of offline civic engagement on civic engagement behavior is much stronger. No differences were found based on demographic characteristics of respondents.

The main limit of the present research comes from the non-probabilistic sample, not representative for the total population. Also, the sample was a rather small one. The analyzed population consisted mainly from students, and although previous studies have shown that youth civic engagement is a good predictor for future civic participation, we don't have enough data to describe the situation for other categories of age and education. Thus, the results are specific for an exploratory, pilot type of research.

Future research needs to specifically address other categories of age and education, as well as to include other variables than demographic ones in order to explain civic attitude and civic engagement behavior. A second stream for a future research will focus on the nature of the social capital created through civic engagement. In this respect it would be really interesting to test the type of civic engagement, and see if it is a bonding or bridging type. The term "bonding" refers to the value assigned to social networks between homogeneous groups of people (in terms of age, studies, interests, opinions etc.) and "bridging" refers to that of social networks between socially heterogeneous groups [29]; bonding and bridging ties can lead to different types of social capital, some positive and some negative, based on Putnam's work. [40] Social capital development on the internet via social networking websites tends to be bridging capital [13], but social capital formation through civic engagement is still a new area, and more research is needed. As previous studies have shown, memberships in bridging groups are more strongly linked to positive civic values than those from bonding ones [17]. This is why a future research direction will be to test the bonding or bridging nature of online civic engagement, since the desired result of stimulating civic participation is to obtain positive civic values and effects.

5. References

[1] ALTMAN, D. and FEIGHERY, E.: Future directions for youth empowerment: Commentary on application of youth empowerment theory for tobacco control, *Heath Education and Behavior,* 31 (641), 2004, p. 641-647.

[2] ASTIN, A. W., SAX, L. J. and AVALOS, J.: The Long-Term Effects of Volunteerism During the Undergraduate Years. *The Review of Higher Education*. 21(2), 1999, p. 187-202.

[3] BRENNAN, M.A. and BARNETT, R.V.: Bridging Community and Youth Development: Exploring Theory, Research, and Application, *Community Development*, 40:4, 305-310, DOI: 10.1080/15575330903279515, 2009.

[4] BROCKNER, J., CHEN, Y.-R, MANNIX, E. A, LEUNG, K. and SKARLICKI, D. P.: Culture and procedural fairness: When the effects of what you do depend on how you do it, *Administrative Science Quarterly,* 45, 1, 2000, p. 138-161.

[5] CARR, D.J., BARNIDGE, M., LEE, B.G and TSANG, S.J.: Cynics and Skeptics: Evaluating the Credibility of Mainstream and Citizen Journalism, *Journalism & Mass Communication Quarterly,* Vol. 91(3) 452–470, DOI: 10.1177/1077699014538828, 2014.

[6] CERON, A.: Internet, news and political trust: the difference between social media and online media outlets, *Journal of Computer-Mediated Communication,* vol.20, 2015, pp. 487-503.

[7] COLLINS, C.R., NEAL, J.W. and NEAL, Z.P.: Transforming Individual Civic Engagement into Community Collective Efficacy: The Role of Bonding Social Capital, *Am Journal of Community Psychology,* 54, 2014, p. 328–336, DOI 10.1007/s10464-014-9675-x.

[8] CONWAY, J., AMEL, E. and GERWEIN, D.: Teaching and Learning in the Social Context: A Meta-Analysis of Service-Learning's Effects on Academic, Personal, Social and Citizenship Outcomes. *Teaching Psychology*. 36(4), 2009, p. 233-245.

[9] DAWES, C.T., SETTLE J.E., LOEWEN, P.J., MCGUE, M. and IACONO, W.G.: Genes, psychological traits and civic engagement, Phil. Trans. R. Soc. B 370: 20150015, 2015, http://dx.doi.org/10.1098/rstb.2015.0015.

[10] DEKKER, P.: Civicness: From Civil Society to Civic Services?, *Voluntas,* 20:220–238, DOI 10.1007/s11266-009-9089-9, 2009.

[11] DIAMANTOPOULOS, A. and SIGUAW, J.A.: Formative versus Reflective Indicators in Organizational Measure Development: A Comparison and Empirical Illustration, British Journal of Management, Vol. 17, No 4, 2006, pp. 263-282.

[12] DOOLITTLE, A. and FAUL, A.C.: Civic Engagement Scale: A Validation Study, *SAGE Open,* July-September*,* 1–7, DOI: 10.1177/2158244013495542, 2013, sgo.sagepub.com.

[13] ELLISON, N. B., VITAK, J., GRAY, R. and LAMPE, C.: Cultivating social resources on social network sites: Facebook relationships maintenance behaviors and their role in social capital processes, *Journal of Computer-Mediated Communication,* vol.19, 2014, pp. 855-870.

[14] FINLEY, A.: The Joy of Learning: The Impact of Civic Engagement on Psychosocial WellBeing, *Diversity & Democracy,* Vol.15, Iss.3, 2012.

[15] FINLEY, A.: Civic Learning and Democratic Engagements: A Review of the Literature on Civic Engagement in Post-Secondary Education, Paper prepared for the United States Department of Education as part of Contract: ED-OPE-10-C-0078, 2011.

[16] FORNELL, C. and LARCKER, D.F.: Evaluating structural equation models with unobservable variables and measurement error, Journal of Marketing Research, Vol. 18, No 1, 1981, pp. 39-50.

[17] GEYS, B. and MURDOCH, Z.: Measuring the `Bridging` versus `Bonding` nature of social networks: a proposal for integrating existing mmeasures, *Sociology*, vol.44, iss.3, 2010, pp. 523-540.

[18] GRIEVE, R. and MAHAR, D.: Can social intelligence be measured? Psychometric properties of the Tromsø Social Intelligence Scale –English Version, *The Irish Journal of Psychology,* 34:1, p. 1-12, DOI: 10.1080/03033910.2012.737758, 2012.

[19] HENSELER, J., RINGLE, C.M. and SARSTEDT, M.: A new criterion for assessing discriminant validity in variance-based structural equation modeling, Journal of the Academy of Marketing Science, Vol. 43, No 1, 2015, pp. 115-135.

[20] HENSELER, J., HUBONA, G. and RAY, P.A.: Using PLS path modeling in new technology research: updated guidelines, Industrial Management & Data Systems, Vol. 116, No 1, 2016, pp. 2-20.

[21] HOSKINS, B., SAISANA, M. and VILLALBA, C.M.H.: Civic Competence of Youth in Europe: Measuring Cross National Variation Through the Creation of a Composite Indicator, *Soc Indic Res,* 123, 2015, p. 431–457, DOI 10.1007/s11205-014-0746-z.

[22] HOSKINS, B., VILLALBA, C. and SAISANA, M.: Measuring Civic Competence across Europe: 10 years, 2012, on, https://ec.europa.eu/jrc/sites/jrcsh/files/20120618COINCivic CompetenceIndex _Brussels.pdf.

[23] HOSKINS, B., VILLALBA, E., VAN NIJLEN, D. and BARBER, C.: Measuring Civic Competence in Europe, *JRC Scientific and Technical Reports,* 2008, *http://publication.jrc.ec.europa.eu/repository/bitstream/JRC42904/bryonycci_jrc42904_final.pdf*

[24] HU, L.T. and BENTLER, P.M.: Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives, Structural equation modeling: a multidisciplinary journal, Vol. 6, No 1, 1999, pp. 1-55.

[25] HUDDART, S.: Open Source, Social Innovation and a New Economy of Engagement, *Open Source Business Resource*, 2008, http://timreview.ca/article/184.

[26] JENNINGS, M.K. and STOKER, L.: Social Trust and Civic Engagement across Time and Generations, *Acta Politica*, 39, 2004, p. 342–379.

[27] JUGERT, P., ECKSTEIN, K., NOACK, P., KUHN, A. and BENBOW, A.: Offline and Online Civic Engagement among Adolescents and Young Adults from Three Ethnic Groups, *J Youth Adolescence*, 2013, 42: 123–135, DOI 10.1007/s10964-012-9805-4.

[28] KAHNE, J.E. and SPORTE, S.E.: Developing Citizens: The Impact of Civic Learning Opportunities on Students' Commitment to Civic Participation, *American Educational Research Journal,*Vol. 45, No. 3, 2008, pp. 738-766, DOI: 10.3102/0002831208316951.

[29] KAWACHI, I., KIM, D. and COUTTS, A. *et al*: Reconciling the three accounts of social capital. *Int J Epidemiol* Aug, 33(4), 2004, p. 682-90.

[30] KLEINHANS, R., VAN HAM, M. and EVANS-COWLEY, J.: Using Social Media and Mobile Technologies to Foster Engagement and Self-organisation in Participatory Urban Planning and Neighbourhood Governance., *Planning Practice & Research,* vol.30, iss.3, 2015, pp. 237-247.

[31] LENZI, M., VIENO, A., ALTOE, G., SCACCHI, L., PERKINS, D., ZUKAUSKIENE, R. and SANTINELLO, M.: Can Facebook Informational Use Foster Adolescent Civic

Engagement?, *Am J Community Psychol,* 55, 2015, p.444–454, DOI 10.1007/s10464-015-9723-1.

[32] LOMBARDI, P., GIORDANO, S., FAROUH, H. and YOUSEF, W.: Modeling the Smart City Performance, *Innovation: The European Journal of Social Science Research* 25: 2, 2012, p. 137–149.

[33] MACGREGOR, S.P., MARQUES-GOU, P. and SIMON-VILLAR, A.: Gauging Readiness for the Quadruple Helix: A Study of 16 European Organizations, *Journal of Knowledge Economics,* 1, 2010, p. 173–190.

[34] MARCHENKO, A.: Comparisons of Civic Engagement in Europe: Evidence from European Values Study, *Slovak Journal of Political Sciences*, Volume 14, No. 4, 2014, p. 331-361.

[35] MONDAK, J.J., HIBBING, M.V., CANACHE, D., SELIGSON, M.A. and ANDERSON, M.R.: Personality and Civic Engagement: An Integrative Framework for the Study of Trait Effects on Political Behavior, *American Political Science Review* Vol. 104, No. 1 February 2010, doi:10.1017/S0003055409990359.

[36] MOORE MCBRIDE, A. and MLYN, E.: Innovation Alone Won't Fix Social Problems, *The Chronicle of Higher Education,* 2015, http://www.chronicle.com/article/InnovationAloneWont Fix/151551.

[37] MOY, P., MANOSEVITCH, E., STAMM, K. and DUNSMORE, K.: Linking Dimensions Of Internet Use And Civic Engagement, *Journalism and Mass Communication Quarterly;* Autumn 2005; 82, 3, 2005, p. 571-585.

[38] PADEL, S. and FOSTER, C.: Exploring the gap between attitudes and behaviour: Understanding why consumers buy or do not buy organic food, *British Food Journal*, Vol. 107 Iss: 8, 2005, pp. 606 – 625.

[39] PANCER, M.S.: *The Psychology of Citizenship and Civic Engagement,* Oxford University Press, 2015.

[40] PUTNAM, R. D.: Bowling alone: America's declining social capital. Journal of Democracy, 6(1), 1995, pp. 65-78.

[41] QUINTELIER, E. and VAN DETH, J.W.: Supporting Democracy: Political Participation and Political Attitudes. Exploring Causality Using Panel Data, *Political Studies,* Volume 62, Issue S1, 2014, p. 153–171.

[42] REDDICK, C.G.: Citizen interaction and e-government: evidence for the managerial, consultative and participatory models, *Transforming Government: People, Process and Policy,* Vol. 5, No.2, 2011, pp. 167-184.

[43] SHAH, D., SCHMIERBACH, M., HAWKINS, J., ESPINO, R. and DONAVAN, J.: Nonrecursive models of Internet use and community engagement: questioning whether time spent online erodes social capital, *Journalism and Mass Communication Quarterly;* Winter 2002; 79, 4, 2002, p. 964-987.

[44] TEMPLE, J.: Growth Effects of Education and Social Capital in the OECD Countries, *OECD Economic Studies* No. 33, 2001, pp. 57-101.

[45] TERLAU, W. and HIRSCH, D.: Sustainable Consumption and the Attitude-Behaviour-Gap Phenomenon - Causes and Measurements towards a Sustainable Development, 2015, file:///C:/ Users/Administrator/Downloads/460-1537-1-PB.pdf.

[46] WALLACE, C. and PICHLER, C.F.: More Participation, Happier Society? A Comparative Study of Civil Society and the Quality of Life, *Soc Indic Res* , 93, p.255–274, DOI 10.1007/s11205-008-9305-9, 2009.

[47] WARREN, A.M., SULAIMAN, A. and JAAFAR, N.I.: Social media effects on fostering online civic engagement and building citizen trust and trust in institutions, *Government Information Quarterly,* Vol.31, Iss.2, 2014, p. 291-301.

[48] WHITLEY, C.T. and YODER, S.D.: Developing social responsibility and political engagement: Assessing the aggregate impacts of university civic engagement on associated attitudes and behaviors, *Education, Citizenship and Social Justice*, Vol. 10(3), 2015. p. 217–233.

[49] ZANOLI, R. and NASPETTI, S.: Consumer motivations in the purchase of organic food: a means-end approach, *British Food Journal,* vol.104, iss.8, 2002, pp. 643-653.

[50] Zhang, W. and Gearhart, S.: The Effects of Internet Use and Internet Efficacy on Offline and Online Engagement, *Online Journal of Communication and Media Technologies* Volume: 5 – Issue: 4 October – 2015.

OPENNESS IN HIGHER EDUCATION

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Abstract
The purpose of this study is to analyze the phenomenon of openness in higher education and its trends and technologies of expanding educational opportunities in the digital information society of Moldovan universities. The main concepts of openness in education are associated with the practice of online learning and constructivist approaches, technical optimization of delivering information, continuous professional development and globalization of higher education. Since skilled knowledge becomes the main value of the market, then higher education perspective as a tool of knowledge reproduction is transformed into the basic space of openness and accommodation to innovative use of educational resources. The key issues related to openness in order to impact higher education target the development of Open Educational Resources (OER), as well as implication of Massive Online Open Courses (MOOCs), relatively new online learning trend. There are institutional practices of the adoption and use of open education technologies in some international universities and organizations, which could be extended as well to create an open learning system in the Republic of Moldova, focusing on national practices of education. Openness of Moldovan HEIs is a strategic choice for the future in a rapidly changing educational market that should proliferate.

1. Introduction

In recent years open education and its technologies of expanding educational opportunities became significant in the European policy agenda. The main reasons of its impact are related to widening participation in higher education, increase of academic institutional visibility and team-based internationalization, enhance of learning outcomes and employability results. A review of literature on open education [3], [7] pointed out the necessity to become aware of open education in higher institutions and the importance of all features of openness in education by emphasis open best practices in teaching and learning and quality of them for regular students.

There are many European initiatives that support openness in online and flexible education (i.e. SCORE2020[2], HOME[3], ECO[4] etc.) in order to offer theoretical, practical and methodological approach, planned to help users to implement new pedagogical experience into learning process as well as to create open courses. Boudreau (2014) affirms that "openness in education can be exemplified through expressions of iterative socio-technological innovations that erode barriers and create multiple opportunities for practice-learning, teaching, and the development of content and learning environments" [1].

A lot of Internet technologies are available to enable openness, when Moldovan higher educational institutions are willing to involve multiple functionalities and approaches.

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This article presents a short analysis of the key issues related to open education models, which represent diverse kinds of openness due to multiple possibilities of interpretation, as well as how this trend are running in the Republic of Moldova.

2. General principles

Open education is the emergent paradigm of interaction between education and information technology and includes free tools, resources and practices used and shared in the digital environment. Open education underlines the power of the Internet tools and systems by offering free access, choice of start times and open availability of content and resources to every individual. In most cases, open education is a generic broad notion under which different meanings of openness could be fitted, such as Open Educational Resources (OER) and Massive Open Online Courses (MOOCs).

The concept of Open Educational Resources recommended by UNESCO Forum in 2002 is: "the open provision of educational resources, enabled by information and communication technologies, for consultation, use and adaptation by a community of users for non-commercial purposes" [4, p.24]. Up to now many other OER descriptions have been offered. Basic understanding of OER is broadly defined and includes different types of learning supports for course material, lists of references and lectures, experiments and demonstration materials, curricula and guides for teachers, educational articles, modules, simulations and so on. OER is a primordial term that comprises open textbooks and open courseware. Besides learning materials themselves, the Open Educational Resources may include tools and software required to develop, use and deliver education materials, including content organization within virtual learning and training communities.

The Open Educational Resources are generally characterized by the following specifications [5]:

- open content means free open access for educational institutions and individual users;
- licensed content, so it can be reused / modified in educational activities;
- educational applications are open source and can be modified / adapted.

Use of the OER leads to the following advantages for institutions and educational networks:

- provide lasting cooperation framework during creation and use of educational resources;
- make efficient public funds investments by sharing collective resources of institutions and professional communities;
- encourage development of digital competences, critical thinking and creativity;
- innovate curricula and teaching-learning methodologies, including resources of public libraries, museums and other cultural organizations;
- facilitate continue learning and social inclusion through open access to resources that otherwise would be unattainable for many user groups.

Thinking about learner facilities, use of the OER has the following advantages:

- open educational resources cover a wide variety of topics;
- materials and references can be used / reused for teaching, learning, evaluation;
- ORE allow teachers to participate in validation and improving of resources through given feedback;
- participation in learning communities via blogs, wikis, social networks;
- focus on promoting learning and education during the whole life;
- acquire essential skills necessary to knowledge society: critical thinking, personal development and creativity, solving practical problems, collaboration and communication.

Another technology of open education is the content of Massive Open Online Courses (MOOCs). MOOCs are open, free and online higher education courses. A MOOC course can always be accessed by anyone anywhere as long as they have an internet connection. Usually MOOCs are designed for large numbers of participants and offer a complete course experience online.

"MOOCs started in Canada and the US, and their rise to prominence was to a large extent driven by service providers such as Udacity, Coursera and Edx." [2] Each of these platforms could be joined by open students, who pay nothing to participate in the course activities, which might include reading educational materials, watching videos, making home works and writing exercises, discussing and commenting via social platforms. The enrolled students have access to recorded class lectures and course materials, as well as to a set of social networking tools that allows group interaction, resulting in a new learning collaborative and conversational chances for students to discuss the course content.

The MOOCs allow universities to open its curriculum to a larger audience, extending the institution's prestige into the community and removes barriers to learning.

Open strategies are essential for the continuous learning – online free education is introduced by both OER and by MOOCs. Open access in higher education from the world's top universities (Stanford, Princeton, Harvard, University of Edinburgh, University of Toronto and so on[5]) was already proven to be profitable for society. Open education should be next essential, integrated step to enhance the circulation and quality of knowledge in Moldova universities.

3. Pedagogical principles

The open frame for higher education foresees a pedagogical strategy to widen access to learners and thus to increase both the institution's reputation and visibility and the quality of the university courses. This strategy includes different dimensions to open up education, specifically methodological approach, content and educational material, technology, research, and collaboration.

[5] https://www.coursera.org/, https://www.edx.org/

Each dimension has an intrinsic relationship with one another and allows for different degrees of openness [3].

Improvement of the educational outlook via open tools requires new skills and attitudes, if they are to concur successfully to an open pedagogy. Through open pedagogical approaches, every learner can have suitable and meaningful educational opportunities, which comprise the access to courses, guided support, assessment and certification in a modern and flexible way. Designing open education strategy brings opportunities to adopt and promote modernization, collaborative learning, learning through discovery and so on. Open strategy offers multiple means of teaching and learning, building and sharing knowledge and enables institutions to be eligible for international collaboration. Thus, university knowledge, practices and opportunities can be available to learners outside their geographical position.

Considering the role of openness in Higher Educational Institutions of Moldova, OER and MOOCs could be some excellent tools to produce and exchange teaching and learning materials, to gain world trustability and consideration, and thus to attract more international students. According to [10], HEIs "should aspire both to create OER and to use OER from elsewhere. (...) By making such resources an integral part of the teaching and learning process, limited face-to-face teaching time with students can be more effectively used to foster engagement and to nurture discussion, creativity, practical applications and research activities".

The case study of Open Education Research Hub shows that good qualitative courses available online appeal new students, enhance institutional reputation and impact professional development [11]. Institutions that use open education are collaborative and outside looking, are characterised by their international level quality and support the creation, development and transmission of social, cultural and economic values. The open technologies not only enlarge teaching and learning practices, but also create possibilities for new resources and teacher education materials to be fitted to the national context in terms of culture, habits, learning practices and needs, e.g. pedagogy, language, and cultural thesaurus. Also, the success and recognitions of open education technologies is conditioned by the quality of educational content and is valued by students and employers.

According to open education dimensions that establish openness of educational practices there are four aspects to be considered in designing and delivering OER: (1) designing an opening up education strategy for a university, (2) configuring the technological infrastructures and software which facilitate opening up education, (3) strengthening the quality of open education, (4) and promotion of leadership in open education. [3]

Thinking through these issues, it is significant to discover certain interpretations of openness which can revive educational opportunities, be fully accessible throughout their circumstances and ensure quality improvement of Moldovan university courses.

The goal of bringing openness in Moldovan HEIs is to establish pedagogical practices via ICTs for the purpose to intensify the effectiveness of learning design and growth students' involvement and collaboration. Open pedagogy makes pedagogical practices visible, transparent and available and also permits learners to plan their own learning way by offering them a large selection of learning resources. Collaboration connects individuals and institutions to exchange educational practices and resources with a view to improving education. By collaborating with each other and with the institution and community via networks, learners and institutions remove boundaries of education in order to produce knowledge, determine their learning route and achieve their aims.

Moldovan universities, like Pedagogical State University and others, have a traditional and durable educational system that attract a narrow range of potential students from Moldova and very few from abroad. Inner students practice an education that is opportune and responsive to their personal growth, becoming fully engaged citizens within society, but all system rather is isolated than open. That's why open education can introduce a robust penetration for innovation education implementation in quotidian pedagogical processes and brings significant impact and international visibility of Moldovan HEIs. Or, integration of open dynamic components into a range of university activities could develop critical approaches to pedagogy.

Nevertheless, most universities of Moldova use e-learning online platforms, mainly Moodle, to train students and support learning process, whose materials are produced by university course teachers of their own initiative, voluntary. These university courses, opened just for discipline students, during one or two semester, consist of a suite of distance learning resources and tools. Each Moodle course focuses on subject modules related to university discipline, with a curriculum designed and developed by subject matter teachers. The modules are being constructed using blended e-learning methods, also providing interactive activities for self-paced learning. These e-learning initiatives are modern and flexible, but all these courses offered within Moodle platforms at the moment are opened just for a dozen of disciplines' learners, not free for everyone to use (e.g. moodle.upsc.md[6]).

In order to improve higher education systems through given potential of OER, UNESCO and the Commonwealth of Learning have developed Guidelines about all aspects of OER to support and make suggestions for integrating OER into higher education. [10], [12] In this way, considering UNESCO strategies and good worldwide experiences[7], Moldovan open education initiatives, in present very modest, have started to develop with the regards to education institutions and academic staff. In author's opinion, improving the quality of teaching and learning through openness will develop a flexible and strong path that even led to future structural and quality reforms of Moldovan HEIs.

4. Legislative Framework and Case Studies of Open Education in Moldova

Developing human potential is one of the main responsibility of the process of modernization of the educational system in the Republic of Moldova. Considering to be a national priority, the Moldovan educational system acts in the base of legislative laws which are applied for the reform of the entire education system and follow to the best educational practices of the world. According to *Activity Program of Moldovan Government 2016-2018* [6], upgrading the infrastructure of public institutions oriented towards innovation, relevance, efficiency, equitable access to education and implementation of mechanisms to ensure openness requires educational institutions to be prepared to develop, provide and use information services anytime, anywhere and via any device in a secure way.

The National Strategy for Information Society Development "Digital Moldova 2020"[8] [8] underlines the necessity of increasing efficiency, expansion and diversification of national education through the opportunities offered by Information and Communication Technology. Another strategic document, *the Education Development Strategy for 2014-2020 years "Education*

[6] Learning Management System of Pedagogical State University
[7] Open Education Consortium – http://www.oeconsortium.org/, Commonwealth of Learning – http://www.col.org/, OpenStax – http://cnx.org/, OER Center - http://owli.org/oer/ etc.
[8] approved by Government Decision no. 857 on October 31, 2013

2020"[9] [9] specifies concrete directions and priority actions referring to digital literacy by developing and applying digital educational content into didactic process, including use of existing open digital educational content (e.g., Discovery School, Khan Academy and others) and enhancing quality of higher education by integrating online courses (Massive Open Online Courses - MOOCs) into the university curriculum. Thus, open, accessible and quality education is declared by Government and Ministry of Education of Moldova as one of the most important priorities, which must be based on human capital development and growth of competitiveness of national economy.

However, the issue of openness is still on the agenda and is closely linked to the financial coverage and profound crisis in the field of educational system of Moldova.

With regard to good practices in the case of Europe, there are policies developed at the level of the European Union: Open Data, Open Access and Open Heritage policies. Some of the European states (UK, France, Denmark, Netherlands and Sweden) are among the leaders in the development of open policies. [13] There are many examples found by review of the specialized literature and website searches, which demonstrate the positive impact of open education in different European countries through the access to OER and MOOCs, that could be implemented in national educational system as good practices of openness in education, namely: France Université Numérique provides free classes in every discipline, Delft University of Technology actives in the area of open teaching, Madrid University provides MOOCs, Virtual University of Bavaria offers free online courses and others examples [3]. Open education projects can expand the approach to learning for everyone, but most of all for non-traditional groups of students, and thus widen participation in higher education.

In Republic of Moldova, open education production activities are at the incipient phase, but there are significant opportunities for the future. OER represent educational resources that can be used and reused freely by anyone without any technological, legal and cost restrictions. Making public programs by means of OER constitutes one of the basic principles of good governance: what is produced with public money should be publicly available free. In this context, during November 2015 - July 2016, the Educational Center Pro Didactica[10], implemented the project *Open Education in Moldova: Here and Now*, with the financial support of the Institute for Open Society in cooperation with the Support Program of Education Foundations for Open Society. The purpose of the project was to promote the access of the interested public (academic staff, researchers, etc.) to create OER and to develop the concept of open educational resources, through awareness, support, coalition formation that may lead to ensure access to quality education for anyone. Another project *Continuous Training of Teachers through Development of Massive Open Online Courses (MOOC),* 2016-2019 implemented by Pedagogical State University of Chisinau is designed to establish open education strategy and to develop and implement a MOOC course into the Moldovan educational space.

These few projects emphasis the acute necessity for Moldova universities to find opportunities to integrate MOOCs and OER that could be particularly attractive and useful to vocational, part-time and international students. In this regard, more information concerning open education models should be discussed and disseminated in Romanian, because the majority literature and developers of OER and MOOCs are in English-speaking countries. Involving Moldova institutions in open

[9] approved by Government Decision no. 944 on November 14, 2014
[10] http://red.prodidactica.md/

education initiatives will broaden participation in higher education, improve training facilities and promote lifelong learning.
At the same time, the Moldovan Government and Ministry of Education need to stimulate the development of a National Open Learning Environment and to support actively all academic providers (teachers, schools, universities, and even the private sector) to become creators of digital resources and incorporate ICT in didactic activities. There is a need to examine the stimulus in order to get academic staff interested in contributing to open education.

Currently, in Republic of Moldova there is no a national framework and strategic policy for the development and use of open education.

5. Conclusion

The phenomenon of openness in higher education covers multiple opportunities to innovate teaching and learning context, including the ability to improve the affordability of education and enable better personalization of instruction. Openness impacts the main pylons of education – curriculum, teaching, learning, research, context, and others. Open online model of learning can bring significant impact to HEIs of Moldova, because it gives the opportunities to implement pedagogical practices in accordance to digital society knowledge. The scope of using open resources in higher education of Moldova via OER and MOOCs is to enhance learning, to share qualitative knowledge and to strengthen social employability.

6. References

[1] BOUDREAU, A. Z., Openness in Education, Systems Thinking, and the Practitioner. In Proceedings of World Conference on Educational Multimedia, Hypermedia and Telecommunications Vol. 2014, No. 1 (Jun 23, 2014) pp. 1065–1071. Chesapeake, VA: AACE. Retrieved August 31, 2014 from http://www.editlib.org/p/147624. Accessed 23/11/2016.

[2] INAMORATO DOS SANTOS, A., et all. Opening up Education, A Support Framework for Higher Education Institutions, European Union, 2016, ISBN 978-92-79-58537-1, http://publications.jrc.ec.europa.eu/repository/bitstream/JRC101436/jrc101436.pdf. Accessed 05/12/2016.

[3] SOUTO-OTERO, M., et al.: OpenCases: Case Studies on Openness in Education, JRC Science for Policy Report, European Union, 2016, ISBN 978-92-79-58536-4 http://publi cations.jrc.ec.europa.eu/repository/bitstream/JRC101533/jrc101533_opencases%20case%20st udies%20on%20openness%20in%20education.pdf. Accessed 10/11/2016.

[4] Programul de activitate al Guvernului Republicii Moldova 2016-2108, Chişinău 2016. http://www.gov.md/sites/default/files/document/attachments/guvernul_republicii_moldova_-_programul_de_activitate_al_guvernului_republicii_moldova_2016-2018.pdf. Accessed 02/10/2016.

[5] Strategia de dezvoltare a educației pentru anii 2014-2020 „Educaţia-2020" (Aprobată prin hotărîrea guvernului nr.944 din 14 noiembrie 2014). http://lex.justice.md/index.php?action=view&view=doc&lang=1&id=355494. Accessed 02/10/2016.

[6] Strategia naţională de dezvoltare a societăţii informaţionale ,,Moldova Digitală 2020" (Aprobată prin Hotărîrea Guvernului nr. 857 din 31 octombrie 2013), http://www.mtic.gov.md/sites/default/files/transparency/public_consults/strateg_857.pdf. Accessed 02/10/2016.

[7] Forum on the Impact of Open Courseware for Higher Education in Developing Countries, Final report UNESCO Paris, 1-3 July 2002, http://unesdoc.unesco.org/images/0012/001285/128515e.pdf. Accessed 02/10/2016.

[8] JANSEN, D. and SCHUWER, R.: Institutional MOOC strategies in Europe. Status report based on a mapping survey conducted in October - December 2014. EADTU, February 2015, ISBN 978-90-79730-15-5. http://eadtu.eu/documents/Publications/OEenM/Institutional_MOOC_ strategies_in_Europe.pdf. Accessed 10/12/2016.

[9] PAVEL BURLOIU, V., CHIRVASE, T., MANOLEA, B. and VOICU, O., et alia: Ghid de bune practici RED, 2014, http://www.apti.ro/sites/default/files/Ghid-Resurse-educationale-deschise_0.pdf. Accessed 18/12/2016.

[10] Guidelines for Open Educational Resources (OER) in Higher Education, UNESCO and Commonwealth of Learning 2011, 2015, http://unesdoc.unesco.org /images/0021/002136/213605e.pdf.

[11] The Open Education Research Hub of Institute of Educational Technology, UK. Case Study. http://oerhub.net/what-we-do/case-studies/.

[12] BUTCHER, N.: A Basic Guide to Open Educational Resources (OER), UNESCO and Commonwealth of Learning 2011, 2015, http://unesdoc.unesco.org/images/0021/002158/215804e.pdf.

[13] Global Open Policy Report 2016, Creative Commons Attribution 4.0 International License. https://creativecommons.org/wp-content/uploads/2016/12/StateofOpenPolicyFullReport_FINAL-1-1-1-1.pdf.

Transparency I

THE ROLE OF INFORMATION INSTRUMENTS IN ENSURING TRANSPARENCY IN SCIENTIFIC RESEARCH (THE CASE OF THE REP. OF MOLDOVA)*

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Abstract
The present paper shows several information instruments created in the Republic of Moldova for the purpose of ensuring transparency in science, innovation and scientific staff training. Their evolution, the way in which they could help enhancing transparency in Moldovan research-development-innovation system, shortcomings in ensuring greater visibility, have been investigated. Three information instruments developed (or under preparation) by the Information Society Development Institute have been examined in detail: i) National Bibliometric Instrument – a digital information system which is a database for collecting, classifying and processing public data on scientific publications in Moldovan scientific journals; ii) EXPERT online – an online information system for applying and assessment of draft programs and projects in the area of science and innovation; iii) Digital Map of Science – a platform in which the functions of existing systems are to be integrated under a common roof in order to provide one-stop-shop services.

Key words: *transparency, information systems, open science, digital content, research management*

1. Introduction

The information instruments give more opportunities for enhancing the transparency of scientific activities and contribute to the quality growth of the obtained results. This is provided by both the increased access to scientific information and the decision making process (selection of the projects, financial distribution, granting awards, scientific degrees etc.). In this way, transparency may contribute to a higher efficiency in using the resources.

The transparency of scientific content fits on the concept of Open science, the importance of which is widely acknowledged in the world. Thus, transparency is a basic element of the Horizon-2020 framework program of the European Commission and 4 global scientific organisations (the International Council for Science, the InterAcademy Partnership, the World Academy of Sciences and the International Social Science Council) stipulate in an international agreement, that opening and transparency are the main elements for the progress of science nowadays [6].

However, the information instruments can't assure transparency by their own and their impact may differ in different contexts. Their success in the ensuring of transparency and the prevention of

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deviations from the norms of right conduct depends on the way of implementation, education and acceptance by the citizens etc. [1].

Transparency in research-development is closely linked to the concepts of digital science and Science 2.0, which presuppose new ways of research (use of web technologies, computer resources, research and analytical instruments etc.) and of evaluation of the research results (webometrics, altmetrics). In the European Union, the goal is to support as much as possible digital science in order to assure more opportunities for science and society. As a whole, the opening up access to the results and processes of research by digital means and the involvement of people as active participants in the processes of research, stimulate the development of ethical and responsible research models if the citizens and society contribute to the results and shape the process of research [5].

2. Issues of ensuring transparency in scientific research in the Republic of Moldova

Until 1991, the Republic of Moldova was part of the Soviet Union. Many key functions, such as the development of science and the training of scientific staff, were directed by Moscow. After the declaration of independence, the Republic of Moldova was trapped into a long transitional period from a planned economy to free market, which had an impact on all fields of activity, including the research-development. Currently, one of the biggest problems is the lack of transparency and the corruption. According to Transparency International, in 2015 the Republic of Moldova was the 103rd in this matter [7].

The current situation in the field of research-development is a consequence of several factors, both objective (economic collapse, scarce funding of research, exodus of experts) and subjective ones (incapacity or unwillingness to learn about new organisational forms of the research process, based on principles of competitiveness; lack of qualified experts or random selection of experts; no incentives for the experts etc.). Although after the year 2000, the competition became a normal element in the field of research-development, the objectivity of the evaluation, of the selection of the most performant projects, of the distribution of financial resources still remains a problem. This happens because of the small size of the scientific community and the lack of mechanisms to promote meritocracy.

In order to make the evaluation objective and to assure the transparency of the process, it was imposed to create databases regarding the existent scientific potential and transparency-improving instruments for the research institutions. Several attempts of elaborating some functional platforms regarding this cause were made, but the structural reorganisations of the institutions responsible for these activities and the lack of a normative, coherent framework regarding the maintenance, the teaching-reception of the databases by activity fields, made these attempts unsuccessful.

Simultaneously, the intensification of the use of information technologies into the solving process of diverse problems, including the assurance of transparency of scientific activities, is assumed at national level by:

- Moldova–European Union Association Agreement (chapter 18 and 24), and by relevant national strategies:

- “Digital Moldova 2020” Strategy (pylon II - Digital content and electronic services),

- "Strategy of research-development until 2020" (section 5: Ensuring of information support of the project evaluation; building of digital content based on the results of scientific research and its dissemination through the use of the TIC solutions),

- "National Program of computerisation of the cultural sphere 2012-2020" (section 2: Digitisation of the material and immaterial cultural patrimony).

Taking into account the state of affairs, but also considering the role of transparency for the improvement of the situation, we want to see how the most important information instruments contribute to the transparency ensuring of scientific activities in the Republic of Moldova. We analysed the websites of the most important actors and the specialised information instruments with the highest impact. The analysis of the instruments has been conducted according to the following methodological scheme: 1) the instrument's key features - 2) its role within the RDI system and in ensuring transparency - 3) the instrument's strong and weak points in ensuring transparency - 4) its impact on ensuring transparency and on well-functioning of the national RDI system. Even though it was not always possible to fully elucidate all these aspects, we think that the key elements which were highlighted, allow us to observe their effect on the system's transparency.

3. The main information instruments that contribute to transparency ensuring in scientific research in the Republic of Moldova

3.1 The websites of the institutions that administrate/coordinate scientific activities

3.1.1 The website of the Academy of Science of Moldova - http://asm.md/

The Academy of Science of Moldova (ASM) has the main organisational role in the field of science in the Republic of Moldova. After concluding of a partnership agreement with the government, the functions of elaboration of policy in this field are delegated to the Academy, which therefore has the role of a science ministry. ASM is also the most important body for politics implementation: it is a finance agency of research and innovation (administrating almost all public resources in the field of science through its agencies), it is the main organisation doing research at national level and it has its own university. From here arises the outstanding importance for transparency ensuring of research-development activity at national level.

The ASM website is a traditional one, with rubrics characteristic for both a public authority and a scientific structure. Although it is the only site which could have synthesised and presented relevant research information, it is a static one, without any information instruments supplying automatically synthesised data. For example, there is a "Scientific researchers" rubric, but when one tries to click on it, it turns out to be a redirection to the respective rubric on Expert-online.

An important rubric of an authority in this field is "Regulatory framework". Unfortunately, the decisions of the Supreme Council for Science and Technological Development (SCSTD) (executive body of ASM) are placed selectively. Moreover, elaborated normative acts and acts waiting for approval are not placed on the website for discussions.

There also exist "satellite" sites of the subordinate administration agencies/structures (e.g.: http://www.acd.asm.md/, http://cpi.asm.md/, http://aitt.md/). Besides the fact that they take some information from the main ASM website, they also publish original material. They neither do not have incorporated specific information instruments for calls and online sending of project

proposals, evaluation, project management or result reporting. In fact, they do not contain databases. Overall, these websites give a general image of the national system of research-development, but there aren't interactive possibilities or instruments for generating information requested by the users. However its impact is a major one. In the last (January 2017) edition of *Webometrics – Ranking Web of Research Centres*, the Academy of Sciences of the Republic of Moldova ranks 25th in Central and Eastern Europe (659th worldwide).

3.1.2 The website of the National Council for Accreditation and Attestation - http://www.cnaa.md/

The National Council for Accreditation and Attestation (NCAA) has an important role in the national research-development system design because, on one hand, it confers scientific and scientific-didactic titles and degrees and on the other hand, it accredits and evaluates scientific organisations. In the Republic of Moldova, only organisations accredited by the NCAA may benefit of funding from the state scientific research budget.

The website of the NCAA includes all decisions of the institution in the field of attestation and accreditation, assuring the access for the users to the data regarding the evaluation of staff and organisations. Whereas at the beginning of the website development the institution had no responsibilities in the field of accreditation (which have been attributed in 2005), the site assures a high degree of transparency and interconnection of data regarding the attestation of scientific staff. There is information regarding the preparation of scientific frameworks (nomenclature of scientific specialities, institutions organising the framework preparation, doctorate commissions - specialised scientific councils, profile scientific seminars and PhD theses) and the existent scientific potential (PhD supervisors, holders of scientific degrees, PhDs and post-PhDs). The website is based on relations between content knots. One of the used mechanisms is the contextual filtration method, used for the implementation of alternative means of site navigation. The application of this method accentuates the link between the site and other parts of the site and contributes to the awareness of the site content position in the information space of the site. [2].

An important element is the embedding of different elements of the thesis defending, the scientific degree granting and the interconnection between these two processes. In fact, the rubric dedicated to the theses is the most dynamic one on the website, because in the Republic of Moldova, 200 theses are defended every year. The elements of the thesis (title, author, degree, scientific field, speciality, date, scientific supervisor, official referents, the institution where the thesis was elaborated, the doctorate commission, key words, annotations, summary in pdf-form, the thesis in pdf-form) are kept separately and are interconnected. Thanks to this, the thesis is represented by relations with other knots, giving the possibility to search/filter according to several parameters. Thus, apart from the thesis in pdf-form (which is very important for transparency ensuring in the scientific degree granting process as it can be evaluated by everyone), we can see the repartition of the theses by institutions, specialities, scientific supervisors etc. A particular importance for ensuring transparency and preventing cheating comes to a statistic regarding the links between different persons participating in the process of thesis taking (between the PhD supervisor and the members of the doctorate commission, between different members etc.), thus finding the existent conflict of interests.

The introduction of the instrument, by placing doctoral theses in Open access (since 2005), as well as the online broadcasting of doctoral theses defenses (since 2013), has contributed to a quality improvement of the theses and to a reduction of scientific frauds, but also helped involving some foreign experts in evaluation of theses. Thus, while an average of 108 foreign experts participated in

doctoral committees in 2007-2010, the figure has grown up to 144 in the years 2013-2016, which is 17.5% of the total number of doctoral committees' members.

It is noteworthy that NCAA, by its theses database, is the only national repository of the Republic of Moldova in the Register of Open Access Repositories (ROAR), being included in 2010, therefore enhancing the transparency and allowing the execution of bibliometric studies. Simultaneously, there are some shortcomings of the NCAA website which decrease the impact of transparency: the annual rapports of NCAA are not posted, the PhD theses are posted only for a limited period of time (only the summaries are permanent), with the change of the nomenclature of scientific specialities in the Republic of Moldova, the website hasn't yet the capacities of presenting the information according to the new standards, there is little information regarding the decline of scientific degree requests, what doesn't discourage people from making deviations from the rules of good conduct in research, there isn't a theses discussion forum, that could be interesting and enhance the transparency in the process of PhD defending.

3.1.3 The website of the State Agency for Intellectual Property - http://agepi.md/

The State Agency for Intellectual Property (AGEPI) is the main public authority in the Republic of Moldova in the field of intellectual property protection (intellectual property objects (IPO), author rights). Besides the protection ensuring and the legal interests of the authors, AGEPI has the attributions to develop and enforce the national system of intellectual property, to fight and prevent the violation of rights of intellectual property and to fight counterfeit and piracy.

The AGEPI website is a complex one, with good interaction between different components. This allows the presentation of diverse information to a diverse audience. All aspects regarding intellectual property that could be of interest for the public are covered, for professional purposes or just for curious users. The users are faced to very detailed information, accompanied by online services and application mechanisms (using digital signature), for brand and industrial model protection, the protection of inventions, plants, literary, scientific, musical or art work, but also for making documented researches.

The transparency regarding the activity of intellectual property protection is very good. The website incorporates a lot of well structured databases (fig.1). All of the 9 existent databases allow the search and display of information regarding intellectual property objects (IPO) by several parameters/criteria. Moreover, there are instruments that generate certain rapports. Thus, for inventions, the National patent landscape is generated, which presents generalised information regarding the patent activity at national level, and the Patent Profile of the Person (inventor/applicant/patent owner), which allows for performing a multilateral analysis of every person's patent activity. The information generated by these instruments is very interesting, both for a large public and for decision-makers.

The information solutions incorporated on the AGEPI website allow a detailed monitoring of the process of intellectual property ensuring and a real opening at a large spectrum of users. In 2016 the number of online applications for registration or renewal of IPO doubled comparing to last year, thus reaching 42% of the total. Transparency of the patenting procedure provided for this indicator's large scale utilization in the procedure of scientific accreditation of institutions, especially that the website automatically generates different ratings for individuals and legal entities. The stimulation of the creative activity through the AGEPI website could be regarded as a

contribution to Moldova ranking the 46th worldwide, before some countries in the region, like Romania, Ukraine and Croatia, according to The Global Innovation Index 2016.

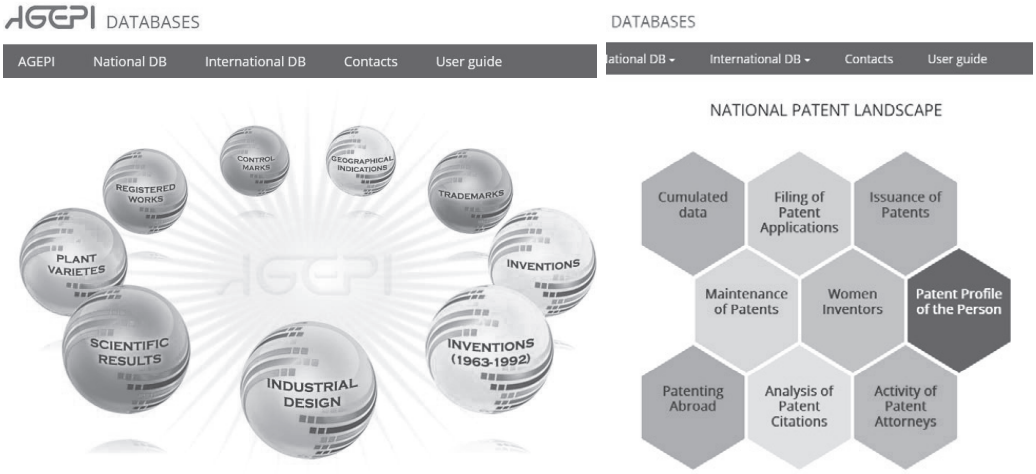

Figure 1: Examples of sites/interfaces of databases on the AGEPI website
Source: http://www.db.agepi.md/

3.2 Specialised informatics instruments

3.2.1 National Bibliometric Instrument - http://ibn.idsi.md/

The National Bibliometric Instrument (IBN), elaborated by the Information Society Development Institute (ISDI), represents an electronic scientific library regarding the scientific contributions of researchers in the Republic of Moldova. That contributes to the transparency ensuring of research results [3]. The project started in 2010 and today it includes articles published in scientific journals in the Republic of Moldova. The instrument offers the possibility to visualise and download the content of all scientific articles from the system, moreover, it provides information regarding the journals where the articles have been published, author names, the projects, the institutions, the countries of the authors and the scientific fields to which they belong. This information, taken from over 100 journals, is given dynamically (tab.1).

IBN also assures transparency in the process of making the decision if a journal should be accredited in the Republic of Moldova (in order to be considered as scientific, the journals have to satisfy a lot of criteria, the fulfillment of the criteria is verified by an evaluation commission, the SCSTD and NCAA making the decision of accreditation (with the attribution of the category A, B and C or the decision to not accredit). On one hand, the objectivity of the commission can be verified, on the other hand, because of the keeping of all evaluation and accreditation decisions, the evolution of every journal can be followed.

The transparency of the articles in the national journals has both a utilitarian role, as it offers possibilities to the researchers to find the needed information in one place, and a role of support for the evaluation and the decision making process in the scientific field. Simultaneously, the quality of the publications increases, as both the authors and the editorial boards of the scientific journals are

more careful about the publications that become a public good for all users. Thanks to the available application, the transparency for the collaboration with other authors is also provided (fig.2).

Content	*Number*	*Content*	*Number*
Included accredited journals	64	Number of journals	2212
Category A journals	5	Articles	49152
Category B+ journals	1	Unique authors	24500
Category B journals	28	Institutions	2328
Category C journals	30	Downloaded articles	39370
Unacknowledged journals	38	Number of downloaded journals	1602

Table 1: The content of the National Bibliometric Instrument
Source: IBN, on the 23th of February 2017

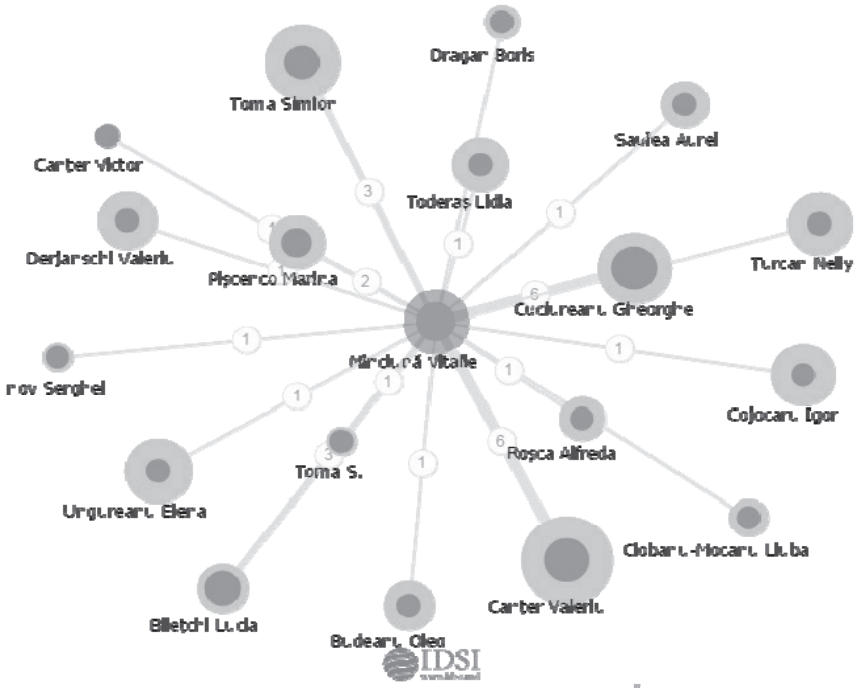

Figure 2: Example of transparency assurance of collaborations in the IBN
Source: http://ibn.idsi.md/ro/displayGraph_page?id=25636

The IBN impact is reflected in the dynamics of the number and quality of scientific journals in the country. Thus, the number of accredited journals droped from 77 in 2013, to 64 in 2016, including due to monitoring through the IBN of the publication frequency, of the compliance with technical requirements and rules of good conduct in publishing (some journals which allowed plagiarism were excluded). At the same time, the number of higher quality journals (A class) increased from 1 to 5 due to their access to the most important international databases, like *Thomas Reuters Web Of*

Science and *Elsevier Scopus*. The number of journals from the Republic of Moldova in the D.O.A.J. increased up to 17, of which 11 being registered during last two years.

The impact is limited because not all publications of Moldovan researchers are included in this database. The pieces of work from abroad and some types of work published in the Republic of Moldova are missing (conference proceedings, monographs etc.). Simultaneously, the introduced metadata do not always permit the finding of the searched information. Thus, the bibliographic references are not included separately into the database and at the moment, citations cannot be followed. Currently, ISDI works both on the bringing in the system of missing publications and on the increasing of the number of publications. Other causes that decrease the effect of IBN as a transparency instrument of scientific activity are: lack of compulsoriness for including the publication into a database in order to be taken into consideration at the reporting, delay of the editing of publications by some journals, delayed transmission of a journal publication to IBN, non-conformation to the demands of the Regulation of evaluation and accreditation of journals. We shouldn't forget the general level of transparency culture in the Republic of Moldova either.

3.2.2 Expert-online - https://expert.idsi.md/

The platform Expert-online was designed by the ISDI (2009-2010) initially as an information system for reception and evaluation of projects proposals in the field of innovation and science. At the debut, it represented a source of independent data, regarding the existing human resources, then it was extended by the taking of the registers that reference to the training and attestation process of scientific frameworks and of research projects in the field of science, then it was interconnected with IBN and the AGEPI website. This allowed the import of IPO from AGEPI. The registers of human potential with scientific degrees and scientific-didactic degrees and titles, the registers of journals, projects, organisations allowed the search and displaying of information by diverse criteria. Thus, the register of persons with scientific degrees and scientific and scientific-didactic degrees and titles allows the generation of data regarding the repartition of persons according to the held title or degree, by organisations, fields of research, specialities, a statistic that is unique in the Republic of Moldova and is necessary for scientific research.

Having as an initial goal to make the expert selection process more objective, the mentioned instruments have significantly contributed to the rise of transparency of the decision making process, showing the competency level of the experts, at the level of argumentation for the distributed financial means volume, cost-efficiency relations etc. ISDI has taken into its responsibility to maintain and develop these platforms of documentation in the field of science and innovation, but this task makes it necessary to involve other persons, holders of information or persons responsible for the activity management in the field of science.

An example for the impact of information instruments is the relation of the informational instruments with the process of scientific accreditation of organisations. In the Republic of Moldova, at least at the early stage, the adoption of activity standards and extern evaluation standards has imposed a higher transparency level on the real situation in the institutes.

The evaluation of the institutes has allowed to intervene with corrections and to develop the database platforms in the field of science and innovation. Among the scientific accreditation standards stipulated by the regulatory framework there also is the requirement of the involvement of the organisation into the editing process of the scientific journals. This element provided the possibility of an approach of the problems regarding the editing of the scientific journals at another

level, of promotion of Open access policies to the scientific results achieved by public financing. The requirement to obligatorily adopt scientific journals by the IBN, laid down by additional documents, has contributed to the development of the IBN and to the expansion of scientific and information possibilities of this instrument.

IBN has assured a certain level of transparency on the scientific results, but the situation regarding resources in the field of science and innovation is elucidated by Expert-online. The procedure of scientific accreditation has allowed the evaluation of human potential entrained into the RDI activities, the level of qualification, the involved organisations, the applied logistics, the national and international projects. The undertaken evaluation activities have made it possible to intervene with corrections and supplements for the platform Expert-online, specifying the held resources in the public sector, and to make proposals for the change of the organisation financing principles, in conformity with the demonstrated performance. We can assess, that Expert-online made the selection procedure of the NCAA and SCSTD experts more objective, being now applied also in drafting efficiency ratings of the scientific personnel.

3.2.3 The digital map of science

In order to enhance the quality of the available digital services, the ISDI has started a project for integration at data level in 2015, based on the scientific-information network, on the existent information systems that function separately (IBN, Expert-online, Indicatori-2020, E-Rating etc.), on a new platform. The new platform is based on the CERIF standards [4], which will have the digital map of science as an interface. The platform tends to complete the information articulation between the stage of launch of creative activities and the stage of publication of the digital content and the offering of information support for the application of the criteria of scientific quality into the financing decisions and into the important evaluations of scientific literature. The realisation of this instrument is based on the following hypotheses:

(1) the production of digital scientific content is a framework for the development of the information society in the Republic of Moldova;

(2) the Open access ensures the transfer of new scientific knowledge to other scientific branches, society and application of these in economics, education, culture and public administration;

(3) quality and intern and international visibility of digital scientific content ensuring favours the development of the information society in the Republic of Moldova on the routes that are in concordance with the Association Accord of the Republic of Moldova to the European Union.

The platform should be an information support for the creators and beneficiaries of digital scientific content in the Republic of Moldova regarding: a) the assurance of quality into the creation of digital scientific content and b) the enhancement of content visibility by Open access.

The innovations of the platform are: supply of a variety of information, visible at national and international level regarding the RDI, that will lead to a higher transparency of the activities in the field of science and innovation, with the following consequences:

- the area of dissemination of new knowledge will increase;

- technical facilities and the fact that the access to digital content is free favour the appliance of research results in industry, education, culture and other activity fields;

- the implementation of other national registers in the RDI field will be ensured, including the reutilisation of information based on the interoperability framework in the RDI field;

- collaboration and efficient communication between institutional actors and professional communities from the country will be facilitated in order to design and apply public policy regarding the development of the information society in the context of European integration.

4. Conclusions

The study showed that the information instruments are important and necessary in ensuring transparency in RDI. In the conditions of the Republic of Moldova, the instruments can help overcoming specific problems, issued from the fact that the Republic of Moldova is a post-soviet country (with a mentality and organisation that leads to a high degree of corruption), with a small scientific community, where there are strong relationships between its members, also of relatedness, and a small number of honest and competent experts.

It is hard to quantitatively evaluate the utility of the described instruments, but the general perception and some results/changes observed upon their introduction, indicate that they play a positive role in respecting rules of good conduct in research and professional training of scientific staff.

The impact of the instruments is limited because of the low level of transparency culture in the local scientific community and because of the lack of functioning of some mechanisms. These lead to the fact that some scientific frauds or arbitrary administrative decisions, that can be established by information instruments, are ignored. This demotivates honest behaviour. In this context, it is highly necessary to develop/enhance transparency culture in RDI in the Republic of Moldova.

The increase of the degree of transparency in national science is necessary, both for enhancing the quality of scientific production and for national goals, regarding the integration of the Republic of Moldova into the European Research Area and the European Area of Higher Education, as elements of European integration, including the commitments resulting from the status of an associated country stipulated in the European Digital Agenda 2020.

5. References

[1] BERTOT, J., JAEGER, P. and GRIMES, J.: Using ICTs to create a culture of transparency: E-government and social media as openness and anti-corruption tools for societies, in: Government Information Quarterly, 27, 2010, pp. 264-271.

[2] BURLACA, O. : Sistem de management al conţinutului pentru Web, teză de doctorat, 2006, available at http://www.cnaa.acad.md/thesis/4735/

[3] COJOCARU, I., CUCIUREANU, G. and MORARU, O. : Instrumentul Bibliometric Naţional – sistem informati c performant, deschis, flexibil, scalabil, in Intellectus nr. 2, 2010, pp. 44-55.

[4] EUROCRIS. Main features of CERIF, available at http://www.eurocris.org/cerif/main-features-cerif

[5] EUROPEAN COMMISSION. Concept paper of the Digital Science vision, and its integration in the Horizon 2020 programme, 2013, available at https://ec.europa.eu/digital-single-market/en/news/digital-science-horizon-2020

[6] LYON, L.: Transparency: the emerging third dimension of Open Science and Open Data, in: LIBER Quarterly. 25(4), pp.153–171, 2016, DOI: http://doi.org/10.18352/lq.10113

[7] TRANSPARENCY INTERNATIONAL. Corruption Perceptions Index, 2015, available at https://www.transparency.org/cpi2015/

CONTENT ANALYSIS OF NEW MEANS OF COMMUNICATION IN CONTEMPORARY DEMOCRATIC STATES

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Abstract
The previous period of United States presidential elections of 1996 has redirected the relevant scientific research to investigate the correlation online communication - political sphere. Consequently were formulated various paradigms and the most discussed was the democratic paradigm, according to which the representation serve as a basic principle of modern democracy. The study of the level of influence of new communication technologies on political sphere became, for a number of scientific investigations carried out in USA, Canada and later in some European countries such as France, Italy, the UK (in 2000 and since 2007 in Romania), an important objective of empirical research. In most cases, the first stage of the investigation of online political communication has been marked by some methodological problems such as: the changeable nature of web space, the necessity to elaborate new indicators able to represent basic aspects of studied reality, the temporal validity of the data. The elaboration of A Model of Cyber –Interactivity by Sally J. McMillan has contributed to overcome these difficulties and has demonstrated the effectiveness of content analysis as research method used for the study of Web Space dynamic reality. Later, the research team from the University of Rochester (Paul Ferber, Frantz Foltz, Rudy Pugliese) have perfected the two-way interactivity model (elaborated by Sally J. McMillan) and have it completed with three-dimensional model of interactivity for the purpose of quantitative investigation of political websites and to argue that these forms of new media correspond to the ideals of cyberdemocracy.

Key words: *content analysis, research method, online communication, political sphere, interactivity, democracy.*

The elaboration of models and the formulation of theories of new media were, in most cases, a research process marked by some methodological difficulties. As mentioned by Benjamin Barber, the fluctuating nature of web space is the main disadvantage for the empirical and quantitative approach of new media. In the opinion of Steven Jones, the investigation of online environment is a real provocation for researchers in the field of human sciences. The author of the book *Doing Internet Research* has described the web space as changing environment and ephemeral information flow. The same methodological problems were identified by Rosanna De Rosa and presented as theses at one of the Annual Conferences of Italian Political Science Association (September 2000, Naples). In his opinion, the period preceding the United States presidential election of 1996 has reoriented the scientific research to investigate the correlation *online communication - political sphere.* Consequently were formulated various paradigms, but the most discussed was the paradigm of democratic representation, according to which the representation serve as a basic principle of modern democracy. The trend of change of emphasis from representation to participation, remarked in the recent years, was conditioned by the development and the increased application of new

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communication and information technologies. In this sense, the interaction between the Internet and the political sphere corresponds with hypermediation process of public sphere and high level of receiver control in the online environment.

All these changes were taken into account by scientific community, focused, in the future, on the argumentation of the hypothesis that new media have influenced the field of political communication. So, the study of the level of influence of new communication technologies on political sphere became, for a number of scientific investigations carried out in USA, Canada and later in some European countries such as France, Italy, the UK (in 2000 and since 2007 in Romania), an important objective of empirical research. New indicators able to represent basic aspects of studied reality, new elements of evaluation of the information flow and the temporal validity of the data (for a period of max. 3 months) were the main methodological problems that marked the debut period of scientific investigations in the field of online political communication. A first attempt of classification of scientific publications in the field, as specified by Rosanna De Rosa, allows emphasizing three main types of analytical approaches of new communication technologies. In this context, the *structural approach* is described as investigation of main technical characteristics of websites, conducted to determine the functionality of the studied units in the communication process. The level of navigation on the website, the interactivity and personalization can be evaluated as a result of meticulous examination of structural components of these forms of new media, including: the number of pages, the quantity of information units and items classification, the presence of elements of interactive communication. For the researchers who opt for the second type of analytical investigation, named *rhetorical approach,* it is important to study "what is communicated, but especially how we communicate" [2, p. 199]. In this case, the contents of websites are examined under the following units of analysis: form, style, language, theme, significance. The third type of theoretical investigation – the *socio-cultural approach* is based on the study of new media as integral parts of a complex social process. It is obligatory for such scientific investigations not only understanding the phenomenon itself, but also the delimitation of certain contextual characteristics. As an example can be, in this case, the analysis of political websites used by candidates during the pre-election period, which sums up not only the examination of contents posted on these online communication platforms, but also the competitiveness of political actors, the dialogue that they have with their opponents or messages sent via the traditional media. Another good example of socio-cultural approach of new media is theoretical and practical study of web space density, research conducted by Pippa Norris in 2001. The analysis of web sites of political parties and governments from different countries was conducted under the following variables: the level of socio-economic development of the country, the degree of democratization, the type of political system, the information system functionality. The results demonstrated the tendency of technological innovation implementation to a higher level in the case of representative political institutions unlike studied political parties. Also, it was established that the utilization rate of new media as a channel for political information depends on the level of economic development of each country [6].

As a result of the analysis of 19 publications in the field of communication sciences, Sally J. McMillan concluded that the web space is a flexible reality, but it can be scientifically investigated. The content analysis is, according to the conclusions made on the basis of this theoretical study, the most appropriate approach to dynamic reality that represents the web space. The unique problems that may occur in the case of empirical investigation of online communication are the rapid development of websites and continuous exchange of contents in digital space. However, this method allowed at that stage (the early 2000s), studying the following three themes: diversity, marketing and use of new communication and information technologies.

Aiming to develop recommendations for the use of this method for studying online communication process, Sally J. McMillan considered useful to find answers to the following main questions: 1. How were readapted content analysis principles to this emerging form of communication from virtual environment? 2. What are the main problems of application of this method for researching the Web?

In brief presentations of the notional evolution of content analysis were mentioned Krippendorff, Berelson, Lazarsfeld - those who formulated in theory and demonstrated in practice the advantages of this method of research. Citing Krippendorff, the author of that paper defines four opportunities offered by this method: 1. is discreet, 2. can be used when the research subject is the unstructured material, 3. take account of context, 4. has the capacity of processing a large volume of data. In his opinion, the possibility of examining a large volume of data is the main advantage "in terms of Web analysis" [5, p. 81].

According to the recommendations made by Sally J. McMillan, concerning the future research in the field of new media communication, the content analysis is an effective method of scientific investigation, but only with respect of two basic principles:

1. are followed the five steps - key for applying this method:
    a) defining theme / working hypotheses,
    b) identification of the material for analysis (sample selection)
    c) establishing units of analysis,
    d) data collection and data processing,
    e) analysis of the results.
2. are examined the defining particularities of new media: multidirectional dissemination of contents, continuous flow of information over long distances, hypertextuality, interactive communication options.

In this context, the specialists in the field noted that political websites - first forms of new media applied to facilitate the dialogue between the government and the governed, are continuously updated and readapted to information needs of users. Mainly integrated in pre-election communication strategy of the states with high development level (US, Canada, UK, Italy, France), the static websites (as booklets) served for the rapid transfer of information to a large number of people and for the increased unidirectional communication. The new age of online political communication has been marked by the development of Web 2.0, the emergence and use of blogs, social networks, microblogging systems and the dissemination of information in audio and video file formats. The interactivity is the basic characteristic of new emerging media forms as a result of using Web 2.0 techniques. This feature of new media allows the conversation between two or more persons in the online environment and in the case of political communication – the direct dialogue between politicians and citizens. Therefore, occurs the exceeding of limits of the unidirectional communication, asymmetric, specific for traditional media and is going on the democratization of political dialogue thanks to new mechanisms for the active involvement of citizens in decision making process. The integration of new media in the communication strategy of political actors,

both during the election period and the period of exercise of political power, are effective tools for the mobilization of electorate and to increase the credibility of the voters. Direct and transparent dialogue, the trend of personalization of the political discourse and to overcome the inefficiencies of previous message, especially observed in the case of presidential and parliamentary communication, are the guarantee of political capital for leaders and functional optimization of representative institutions.

As mentioned by John C. Tedesco, the study of the application of new media in political communication has contributed to the diversification of problems and, consequently, to the renovation of research methods [7]. Following the example of Wimmer and Dominick, the American researcher delimits, in the basis of the criterion *the thematic of the research*, the next four steps:

1. defining characteristics of the new medium of communication (investigation period of the advantages of using NTC by political leaders and representative institutions, are mentioned: Selnow, Barber, Sparks etc.);

2. analysis of the use and users of new media (includes: the study of new environment as digital device, the investigation of political candidates websites and of the correlation *Internet - politics - public sphere,* are mentioned Bennett and Entman who argued the thesis concerning the ideal emergence of a public sphere devoid of political constraints on receiving information, Blimber who predicted that the Internet will become a system of hyperpluralism, Gamson who studied the importance of public discourse for the development of democracy etc.);

3. determining the effects of new media (in this thematic compartment are mentioned the results obtained by researchers who have investigated the structural obstacles of the Internet (Entman, Barber, Gandi), the civic engagement (Garramone, Gamson) or political mobilization (Norris, Sparks, Keane), the new generation of the Information Society (Putnam, Delli Carpini) and the credibility of information posted online (Whillock, Glas));

4. the approach of investigation perspectives of online political communication.

In the description of step 4 are listed the main results of American experts, presented in various reports in the years 1996-2001, and most important scientific publications that contain recommendations and suggestions on new media research methodology. As an example, in the first case, is mentioned the project *Congress Online*, focused on the complex investigation of 605 political websites and ended with the presentation of a detailed report in 2002. For the investigation of politicians' online communication platforms it was applied a mixed method, derived from a combination of the following processes: focus groups, interviews, public opinion poll, qualitative and quantitative analysis of key structural elements of political websites. According to the analysis of final results, the following conclusions have been formulated: websites are used mostly for the promotion of politicians; online information disseminated in this way is not as expected by users; this situation can be improved if you take into account the five elements that serve to determine the effectiveness of online communication: the public, the information disseminated to citizens, the interactivity, the level of use, the innovation.

The scientific papers of Sally J. McMillan (Professor at the University of Tennessee Knoxville) were appreciated for the complex approach concerning the application of content analysis in the

case of web space investigation. Based on the analysis of 108 websites, the elaboration of the *Model of Cyber –Interactivity* has demonstrated the use of this method and served to formulate some important answers on multi-structural nature of the current online communication. According to this model, presented by Sally J. McMillan in 2002, in the paper *Four-Part Model A work of Cyber-Interactivity: Some Places That and More Interactive Others*, the communication through new media can have four representations for each of the three main types of interactivity and may vary depending on the level of receiver control. The sender, the receiver and participants are key elements of this model and serve to describe the different roles that individuals have in the process of one-way and two-way communication. The high level of receiver control is possible for the interactivity of category *user-to-user*, in the case of unidirectional or bidirectional information flow, the achievement of feed-back or mutual discourse. The monologue and the responsive dialogue are indicators of low level of receiver control in the case of the same type of interactivity [4]. The research team from the University of Rochester: Paul Ferber, Frantz Foltz, Rudy Pugliese have perfected the two-way interactivity model (elaborated by Sally J. McMillan) and have applied it to determine "political Web sites' progress toward the ideals of cyberdemocracy" [3, p. 391]. The *Six-Part Model of Cyber-Interactivity* has maintained the same graphic elements used previously to describe the process of online communication and took over the two key concepts: *level of receiver control* and *direction of communication.* To describe the mechanism of public deliberation, they formulated the concept *three-way communication*, which defines the exchange of information, where the third party has the role of knowledge and conferring of a surplus of transparency by publishing message. In this case, the level of receiver control is low if the message is influenced by the source and we have high level of receiver control when communication is made in form of public discourse. The content analysis of 50 political websites, by quantification of its interactive elements, conducted by Ferber and his colleagues, argued the thesis according to which only online platforms of two-way and three-way communication can contribute to the achievement of public deliberation and democratic dialogue [3].

By definition, the presidential communication is formulated as the dissemination, by the president or the presidential institution, of the public or national interest information. The president's interventions as the symbolic leader of a nation, most often, are decoded by the public as special moments. These addresses to the citizens, in the form of speeches, are usually made on special occasions: political ceremonies, crisis situations or major governmental actions. The sober style, ritualized, established by tradition, is specific to this type of institutional political communication.

At present, the new media are important means of optimization of presidential political communication, able to modify the solemn speech, giving it a surplus of veracity and realism. In this sense, we note that the majority of chiefs of democratic states have a personal website and an official website. Unlike other forms of new media (Facebook, Twitter, YouTube, etc.), these online communication platforms have the highest degree of applicability, contributing to political speech personalization and media coverage of presidential action. Content analysis method, applied by the researchers of the University of Rochester (Paul Ferber, Frantz Foltz, Rudy Pugliese), was appreciated and taken up by different researchers in order to determine the effectiveness of political communication. This method consists in quantification of interactive features of investigated new media, analysis of elements involved in online communication process, determination of the level of receiver control. Therefore, the development of a grid for analyzing personal or official websites of Presidents would require the identification and quantification of important elements for the promotion and visualization of political activity such as: information indicators and interactivity indicators. The category of information indicators corresponds to the unidirectional dissemination of messages from political actor to citizens, being considered "use of the Web by top-down scheme"

[1, p. 213]. One of the main features of the informational content is that these messages can be disseminated not only online, but also through traditional media (newspapers, radio, TV). Usually these elements that serve to the achievement of asymmetric communication include (in the case of Presidents' websites): information about the President, the presidential institution or the country that he represents, political leader activity data, slogan, fragments of speeches, the agenda of events, press releases, photo gallery, external links. The list of interactivity indicators includes a number of items that contribute to the establishment of public deliberation. These elements are derivatives of the new options of Web 2.0 technologies, contribute to the achievement of two-way and three-way communication, allow for Internet users to be in the direct dialogue with political leaders: they can ask questions online and receive answers, to express their opinions or participate in debates on specific topics. Following the example of Ferber and his colleagues, on these political websites can be determined the following indicators of interactivity: functional e-mail to political leader or contact forms, active e-mail or contact forms of the staff of presidential institution, site search engine, e-subscription, virtual tours or educational material, online surveys, public forums.

The official websites, Facebook pages, Twitter, YouTube, are the main forms of new media currently applied in governmental communication process of the most European democratic states. These new means of communication and information serve to visualize the activity of government, increase the level of political participation of citizens and contribute to the promotion of electronic democracy. As objects of some researches carried out with the application of quantitative method content analysis, the websites of governments can be evaluated in terms of compliance of representative institution at two basic principles of effective functioning: the representativity and the accountability. The list of information indicators will include in analysis grid the following contents: government program, plan of actions, agenda of events, informative notes on the main activities of the Prime Minister, links to official websites of ministries, extracts of minutes of government meetings, press releases on the activity of the Prime Minister, ministers, members of the government, reports and statistical information. The complex analysis of technological aspects of the official website of this representative institution involves determining the applicable structural elements to achieve direct dialogue between political leaders and citizens such as: e-mail address of the Prime Minister, ministers, members of the government, or contact forms to government communicators, public forums, online surveys, links to Facebook pages, Twitter.

In the case of the investigation of governments' official websites or of online communication platforms, created by the representatives of this institution in order to conduct projects aimed at increasing the level of political participation of citizens, it is advisable to take into account the theoretical and practical value of the concept *e-democracy.* Transparency and access to information, partnership and public deliberation of some major problems are the main objectives of electronic democracy. The procedure of online consultation with civil society before approving a series of normative acts, drafts of laws, proposals for government decisions, public policy proposals, etc. is an example of successful implementation of e-Government Project and its objectives thanks to the integration of new media in the process of government communication.

The investigations carried out by the Inter-Parliamentary Union experts and the results presented in various reports confirmed the thesis of using the new media as renovation means of parliamentary political communication. According to statistics, in 2000 approximately ½ of total legislatives across the world had an official website, used for the purpose of rapid distribution of the information regarding the activity of drafting and approving law, in order to respect the basic principles of these representative institutions (representation, accountability, transparency) and for effective communication with citizens. The contrastive analysis of 125 websites of national

legislative institutions, carried out by the IPU's experts, demonstrated the presence of similar structural elements and the trend of compliance of these online communication platforms to a standard model of political website. These websites contained a multitude of contents about legislative institution, on its structure and activity, tools to facilitate the access to information (sitemap, search engine, information in international languages, section *News*), interactive communication elements that help achieve bidirectional communication between political leaders and citizens and contribute to consolidating the good image of democratic institutions in the 21st century. Content analysis of these online communication platforms can be useful for studying the evolution of these forms of new media and their applicability in the context of parliamentary political communication. The main items recommended to be included in the list of information indicators are: information regarding the parliamentary system and the structure of legislative institutions, data about the Speaker of Parliament and Vice-Presidents, the list of Members of Parliament, information on parliamentary or electoral system, the full text of the Constitution, agenda of the parliamentary sessions, information about legislative, budget and oversight activities, information on decisional transparency. The list of interactivity indicators includes the main structural elements of the website that allow the direct dialogue between politicians and citizens: online services to send messages (MailTo), e-mail addresses of parliamentarians, external links to the official websites of central public authorities and those of major international parliamentary organizations.

A first analysis of the main forms of new media used by European parliamentarians in the political communication process allows us to conclude that blogs, social networking sites and microblogging systems are used, first of all, for the rapid information and for the knowledge of public opinion. The investigation of these types of online communication platforms requires the determination and quantification of a series of visual, discursive, audiovisual elements. For example, the analysis grid of a Facebook page may include the following indicators: quantity, thematic and frequency of posted messages, audience share, expressed by the number of likes, presence and significance of visual (audiovisual) elements, the level of interactivity (calculated in accordance with the quantity of forwarded messages, the number of likes and comments).

The analysis of main forms of new media integrated in communication strategy of Moldovan parliamentarians allows us to note that Facebook and Twitter are the most popular and frequently used. These online communication platforms were appreciated for the possibility of posting concise messages and for the rapid flow of information. In 2016, Marian Lupu and Mihai Ghimpu were the most active users of new media and Iurie Leanca is recognized as Moldovan politician with the largest audience in the online environment.

Facebook page of Iurie Leanca, the actual President of European People's Party of Moldova, was created in 2013, contains a variety of discursive and visual elements used effectively in order to consolidate the image of the politician and is appreciated by 45 985 persons. The rubric *information* includes: data on marital status and regarding the activity of political leader, his biography and the welcome message on his Twitter account, a link to the official website of the European People's Party of Moldova. Despite the large number of posted contents, the video (posted on November 27, 2014, with a total of 111 519 views) is the unique element of personalization of his political discourse. There the political leader participate at the interpretation of the song *A new day, a new life* - musical work that, in his opinion, serves to expressing the pro-European position of Moldovan young people. Messages posted on the wall of this Facebook page are made by the person I singular, sometimes contain links to primary sources of information or video fragments. Unlike other political actors that intervene with answers to some user comments, the communication

strategy of Mr. Iurie Leanca is focused on providing timely the information on the most recent political events. We observe, in this case, that the posted messages are similar to informative notes and serve as a theme for public debates.

References

[1] BASTIEN, FR., GREFFET, F. : Les campagnes électorales à l'ère d'Internet: une comparaison des sites partisanes en France et au Québec. In: Hermès 54. Paris: CNRS Editions, 2009.

[2] DE ROSA, R.: Fra comunicazione e politica. Gli spazi virtuali della democrazia che cambia. In: Domenico Frungillo. La transizione incerta. Vol. 5, Avellino: Studi Meridionali, 2001.

[3] FERBER, P., FOLTZ, FR. and PUGLIESE, R.: Cyberdemocracy and Online Politics: A New Model of Interactivity. In: Bulletin of Science, Technology & Society, 2007.

[4] MCMILLAN, S. J.: A Four-Part Model of Cyber-Interactivity: Some Places and More Interactive that Others. In: New Media and Society, 2002.

[5] MCMILLAN, S. J.: The Microscope and the Moving Target: The Challenge of Applying of Content Analysis to the World Wide Web. In: Journalism & Mass Communication, Vol. 77. No. 1, 2000.

[6] NORRIS, P.: Digital Divide: Civic Engagement, Information Poverty and the Internet Worldwide. Cambridge: Cambridge University Press, 2001.

[7] TEDESCO, J. C.: Changing the Channel: Use of the Internet for Communicating about Politics. In: Handbook of political communication research. Mahwah, New Jersey: Lawrence Erlbaum Associated, 2004.

CORRUPTION IN THE EXTRACTIVE INDUSTRY SECTOR REINVENTING TRUSTED GOVERNANCE "IRAQI CASE"

Paiman Ahmad[1]

Abstract
In the natural resource governance, corruption and transparency both got high attraction from the public and worldwide institutions, which focus on transparency, corruption and good governance. Tackling corruption in extractive industry in countries endowed with natural resources is the core concern for the people, yet governments in most developing countries are not concerned about being prepared for the transparency and accountability initiatives for creating open governments. This study offers a review existing literature aiming at evaluating the impact of E-Government for transparency and accountability in the extractive industry sector in Iraq since 2003. In fact, the natural resource governance needs good governance principles to be enforced for improving transparency and accountability between the government and the companies during, licensing, exploration, contracting, extraction, revenue generation and the allocation process of the revenues. While, E- Governance has got international attention from developed and developing countries, the initiative started with Kimberly Process Certification Scheme (KPCS), followed by the Global Witness/ Publish What You Pay Coalition (PWYP), with the recent emergence of the Extractive Industries Transparency Initiative (EITI). Many resource abundant countries such as Iraq, Nigeria, Venezuela, Angola, etc, underperform in terms of socio-economic development, those countries face the 'the resource curse' as an economic phenomenon, which is interlinked to the politics of resource governance. Indeed, corruption and transparency as the main principles of pure governance in natural resources set the picture of government for being accountable for his populations. ***This study aims in answering this thesis:***

- *In the absence of E-Government, corruption hampered the revenues in Iraq similarly as many other rentier states*

Key words: *Iraq, Extractive Industry, Corruption, E-Governance, Transparency*

1. Introduction

Corruption has got intensive literature; for the purpose of this study corruption is defined as "principally a governance issue – a failure of institutions and a lack of capacity to manage society by means of a framework of social, judicial, political and economic checks and balances." [UNDP, 2006]. Comparably, the World Bank (1997) defined corruption as "the misuse or the abuse of public office for private gain." According to the United Nations Convention against corruption (2004) noted "corrupt officials will in future find fewer ways to hide their illicit gains, especially in the developing countries where corrupt official have plundered the national wealth while governments badly need resources to reconstruct and rehabilitate their societies." A straight forward

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definition is given by Danish International Development Agency (DANIDA), which defines corruption as the "misuse of entrusted power for private gain" that corresponds to the concept of corruption in the Danish Penal Code and in international anti-corruption conventions. CleanGovBiz (2014) highlighted corruption "as one of the main obstacles to sustainable economic, political and social development, for developing, emerging and developed economies alike." Argued by Transparency International (TI) "when essential institutions are weak or non-existent, corruption spirals out of control" such as the case in "Iraq, Afghanistan and Somalia."[BBC, 2009]. Consequently, "rules and regulations are circumvented by bribes, public budget control is undermined by illicit money flows and political critics and the media are silenced through bribes levering out democratic systems of checks and balances."[CleanGovBiz, 2014]. This study is about corruption in a specific sector, which is the source of income and economic well-being of the entire community in Iraq. Therefore, combating corruption in Iraq has recently been the main issue of the government in power. Even though the Iraqi government was late in boarding the ship of e-government due to the chaos the country is in since 1980s. Admitting that corruption is a serious threat to economic development and stability in Iraq and elsewhere, bearing in mind that corruption creates a cycle that would make sure that benefits are concentrated on these small sector of the populace. [Balboa& Medalla, 2006]. Responding to this need, "corruption is nurtured by politicians who coddle supporters and followers, who in turn pressure them to engage in corruption to spread the benefits of a corrupt regime." [UNDP, 2004]. Accordingly, corruption thrives when government policies for transparency and integrity are poorly designed, like in Iraq. Governance by disclosure has become the heart of the global governance trend, in transparency the government's role is asserted to clear corruption in the natural resource sector, a sensitive question is, why corruption is a pervasive phenomenon in developing rentier states? Theoretically governments abundant with natural resources pretend that they fight corruption, but in practice corruption alarms in those countries.

1.1 "Theory of War Trap and Corruption"

The enforcement of sanctions in 1990 under the Security Council Resolution 665, till, lifting of the sanctions following the Iraqi invasion in 2003 under the UN Security Council Resolution 1483, the process has created the climate for systematic corruption. [CNN, 1999]. In the broadest sense, for the economic coercion to work, target elites must suffer as much as the target population. In parallel to this, sanctions permit target regimes to strengthen state control over the economy, especially if the target regime is authoritarian; this was typically true for the Iraqi Saddam Hussein's regime. [Drezner,1999: 13]. According to the economic argument, waging war and military intervention is very expensive as it was for the United States in the case of Iraqi intervention, yet the truth is the economic spill-over is much more for the Iraqis compare it to the Americans, since for almost 3 decades since the invasion, the Iraqi economy is maneuvered by high levels of corruption. According to this logic, costly sanctions have created a suitable climate for corruption to spread in Iraq since 1990. As, Keohane (1993) has well championed the economic coercion, since imposing sanctions and economic leverage is used to extract political concessions," but in Iraq the Ba'ath regime instead of concession had tried to get more funds by corrupting the economy and the high governmental officials. This has helped the government to power direct the petroleum sector illegally to target the benefits of the resources for a particular group. In the post invasion era, the logic of corruption was well coded, and the networks were present. It is claimed that "each war is a unique event with its own idiosyncratic causes and its own idiosyncratic consequences." [De Mesquita, 1981:3]. In a sense, Saddam Hussein is well-known for his military and authoritarian leadership in the Middle East and globally, his image is known as a tyrant who devastated the economy of three states including Iraq, Iran and Kuwait. Since, the Iraqi economy and the

population suffered from the eight years' war with Iran, plus the invasion of Kuwait, the embargo and the sanctions all in all has devastated the economy. The economic consequences of wars and economic blockade has further framed the economy in a Prebendalism system that has further deteriorated and crippled the public well-being of Iraqis and the misuse of revenues in favor of government supporters. Referring to Hussein's attempt in singling out a specific program during the humanitarian emergency October 1994, it decided to favor the military, police, security and other elite forces with special monthly allowances and other privileges. Some of the privileges were extended to civil and military pensioners. While these privileges cover some 3.5 million people the other 17.2 million Iraqis, or 83 percent of the population was left out of the program of privileges [FAO 1995: 7-8 and 19]. In sum, a clientelist regime, in a predatory system the public and private resource are melded and public office serves as a means for the creation of private wealth. [Alnasrawi, 2000]. Broadly, clientilism and prebendalism is at stake in the absence of active media, high public awareness, and absence of E-government in Iraq. In essence, Prebendalism was first addressed by Richard Joseph to describe a central feature of Nigerian politics. In examining this unusual term, this phenomenon is widespread in most rentier economies, especially in the case of poor governance and dysfunctional system such as in Iraq. Remarkably, Joseph envisioned "prebendalism" as "the state offices are regarded as prebends that can be appropriated by officeholders, who use them to generate material benefits for themselves and their constituent and kin groups. [Joseph, 2013]. It could be noted that the Iraqi corruption did not start yesterday; it started almost 35 years ago, and sparkled in the 90s, as a need to feed the government's military hunger for the Ba'ath regime's survival. In conceptualizing prebendalism in Iraq, in practical term, it is comparable to the similar situation in Nigeria, to begin; the Iraqi political landscape as a fragile state is featured as a short time-horizon in which resources accruing to the office can be diverted for personal and related uses, or for the capital accumulation, which it facilitates.

In the current situation with the absence of a competitive government, and lack of good governance, the Iraqi economy is floated with prebendalism, for understanding prebend. In their contribution Adams and Brock (2004) argued that conglomerate giants were portrayed as superior to decentralized capital markets in allocating financial funds among alternative uses and in ensuring that these funds would flow to their most socially desirable uses. [p.71]. Referring to transparency in the absence of E-Government in Iraq, the entire system, and revenues are poorly generated, for example; recruitment, procurement, employment are oriented in more patrimonialism base, like Max Weber states "*the most universal form of human political interaction is a patron-client relationship in which a leader exchanges favors in return for support from a group of followers."* [Joseph, 2013]. There is a lack of literature on Prebendalism and Patronage in regard to Iraq and the use of natural resources, adding Van De Walle's (2007) contribution in addressing patronage as "the practice of using state resources to provide jobs and services for political clienteles." On the basis of this analysis, corruption alarms as a consequence of state dynamics in the Iraqi extractive industry, the misuse of revenues by corrupted politicians marginalize the Iraqi public. According to, information during the interim government period in Iraq, the quest for "greater transparency in oil governance should start with oil flow metering, a public consultation on oil policy, and the publication of all revenues derived from the oil sector. Strong accountability mechanisms are also required, through independent media, auditing and judiciary." [Le Billion, 2005]. In fact, petroleum sector was hampered by the central role of Saddam's regime, adding, Sayne and Gillies (2016) pointed out that "between 1996-2003, certain traders taking part in the United Nations monitored Iraq Oil-for-Food Program (OFFP) negotiated secret side payments to the Iraqi government in exchange for the oil they received. Actors involved in the scheme used shell companies, disguised corporate ownership, and offshore banking services to facilitate the payments." As a consequence, the Iraqi government was able to generate over $ 1.8 billion for Saddam Hussein's regime. This

shows how governments can monopolize even international organization such as the UN for maximizing their governmental interest from their resources. Uprooting corruption in Iraq needs a strong will of the government, to combat the networks of corruption in the public sector especially in the energy sector. According to Cockburn (2009) the UN sanctions imposed a tight economic siege and were designed to keep oil revenues out of the hands of the ruling elite. In the light of this, in 2004-5 the government allocated $1.3billion for weapons purchases." It is claimed that war has created a power vacuum for spreading corruption, and lack of checks and balances has further deteriorated the situation. In a similar case, during the 2004-7 in which $600 million in food rations supposedly sent to Anbar and other Sunni provinces at a time when those places were partially controlled by the insurgents, due to violence there is no clue that goods paid by the government had ever been delivered. Combined with this, Cockburn further emphasized the effect of the sanctions sow the seeds of corruption, as the Iraqi regime was in economic stagnation, currency collapsed, thus government officials found a way of evading sanctions to accumulate resource illegally to generate funds for government survival. In responding to need, government officials in Iraq during the Ba'ath regime for the first time involved in a systemic corruption, hence "the men who orchestrated these black market deals under Saddam Hussein found they could quickly establish the same sort of corrupt relations with post-Saddam government." [Cockburn, 2009]. The rising of new public administration and E-Governance for Iraq was in a period where the level of corruption and poor governance prevailed in the system and it has still remained very high. Since the sanctions, Iraqi oil sector was marred by political and economic strife in particular because of a 10 years history of the corrupt military regime. Looting of the public treasury is the serious concern for the new government of Haider Al-Abadi, who has committed to uproot corruption and grappling kleptocracy, which is facilitated by sectarianism and power sharing, and struggling to reform a political system beleaguered by corruption. In respond to reforms his recent effort was a contested cabinet reshuffle aimed at depoliticizing governance. [Karam, 2016]. Arguably, corruption in extractive sector is quite different, in line with this; EITI might be enacting disclosure, transparency and accountability, yet cases such as UNAOIL company huge bribery scandal give a brief on how high level officials are involved to gain the big shares from contracts and projects. Indeed, a case such as UNAOIL which has been on social media needs a sound governmental response. [Baumann et al, 2016]. Indeed, cash flow from energy sector is very big and it represents a very serious temptation to corruption. The lack of e-government complicates the process of revenue flow in Iraq and limits the government capacity in avoiding the abuse of revenues for political and individual gains in general. In fact, corruption in the energy sector is endogenous since the sector is monopolized by the Iraqi government, while the exogenous part is from foreign oil and gas companies, which desire to make huge gains from the contracts and projects. In this context, for the Iraqi government to control corruption is pursuing zero tolerance policy to combat corruption within the sector, by uprooting endogenous corrupt practices in the energy industry. In tackling corruption, for the efficacy of e-government development, USAID (2007) in the list of top "10" database driven E-Government initiatives, which supposed to be prepared after long in depth consultation with a selected group of Government of Iraqi Chief Information Officers (CIOs), ten ministries and entities of the Iraqi government are places as the top priority, while Ministry of oil "energy sector" is not listed," the objective of excluding energy sector is very odd, since petroleum products makes a variety of useful contributions to the Iraqi economy.

Based on the same USAID 2007-2010 strategy for E-Government, it was expected that the part of the Ministries involved will achieve the desired results of delivering at least 50% of these projects within their estimated time frame, whereas after 6 years in post planned strategy even 10% is not achieved in E-Government in Iraq yet. Besides, in mentioning the benefits of E-Government in Iraq nothing is mentioned about "integrity, transparency, accountability, corruption" which conveys that

E-Government strategy was only a starter. One of the most serious barriers to E-Government in Iraq besides; security, lack of hard and soft capital, "the silo" agency-centric approach of government, where information sharing is limited, thus for E-Government transformation to success, a shift will need to occur at every level of government in Iraq. (USAID, 2007). In the global e-Government indexes, the Iraqi government performs poorly as being counted as a rich country besides, in some indexes for ICT Iraq has no existence such as ICT Development Index 2016.[2]

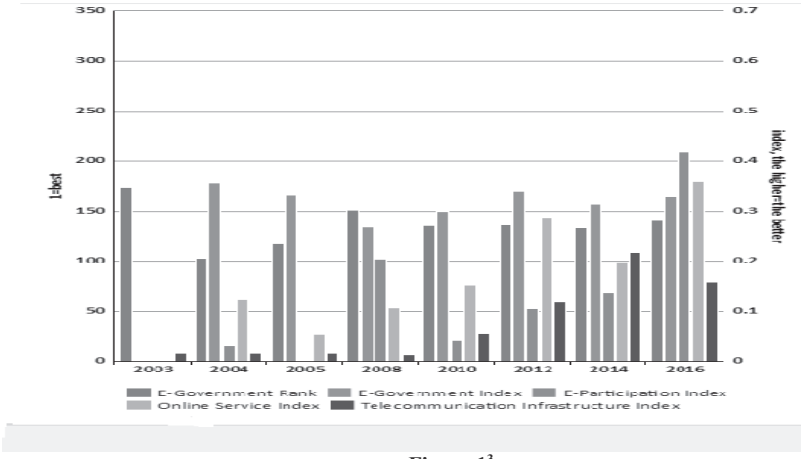


Figure 1[3]

1.2 Corruption in the Extractive Industry "Iraq"

Corruption is generally harmful to any community and to economics; in fact corruption in the extractive industry is very sensitive, it is not like a tax or a fee it is more than that. In the case of the resource abundant countries the rents from natural resource are the source of fueling the economy like in Iraq. In developing resource abundant countries in certain cases the rents from resources are not channeled properly to the economic growth and welfare of the citizens instead, it goes into private pockets or to officials who are involved in the extractive industry. In economic terms, corruption in extractive industry means exhausting the scare resources for unproductive deeds similarly means "economic development is difficult in countries where corruption undermines the development of fair market structures and distorts competition."[Hama, 2016]. The Transparency International /Corruption Perception Index (CPI), ranked Iraq 161/168 countries with the score of 16/100 which shows that Iraq is in high level of corruption scale. According to Business Anti-Corruption country profile for Iraq, "corruption in the public and private sectors is a serious challenge for business in Iraq. Besides, "companies can expect to contend with several forms of corruption, including a deeply entrenched patronage network, and investors may face pressure to take on well-connected local partners to avoid bureaucratic hurdles."[Iraq Corruption Report, 2015].

The factors that affect mitigating corruption are many in any country context, in getting to analyze why industrial countries are less corrupted comparing them to highly corrupted resource abundant

[2] See: ICT Development Index 2016 at: http://www.itu.int/net4/ITU-D/idi/2016/#idi2016map-tab.
[3] Source: https://knoema.com/UNEGR2015/un-e-governmant-ranking-2003-2016?country=1001260-iraq

countries. In available literature few factors are seriously discussed and investigated; including type and structure of the economy, level of income, institutional capacity, and type of governments, culture, yet incentives for corruption are key drivers for stimulating the process. An appropriate approach that can combat corruption effectively is E-government and openness, which pushes government towards transparency and effectiveness in the natural resource governance. Comparing extractive industry to the other industries it is more sensitive, and it is harder to avoid corruption, because this sector is governed by the government institutions and the high officials. In the rentier states, Carmody (2009) contends in a "win-win bonanza" where foreign firms benefit from bad governance through securing favorable contract terms by networking with domestic political elites who serve as gatekeepers from natural resource extraction. Accordingly, "the extractive industry is ailing the economy of Iraq, and escaping the natural resource curse is hard for a weak state, improving economic performance in a single commodity driven country is highly critical, the Iraqi main natural resource is oil and that is the single commodity that fuels the economic sector, besides natural gas. In fact, Iraq is more prone to corruption in petroleum sector compare it to the rest of the other sectors, this does not mean that corruption is lower, but extractive industry generates huge money, and the rents are under the control of government. In this regard, "corruption has been cited as one of the most prevalent and persistent challenges in enhancing economic growth and improving the quality of life of citizens across the globe."[Mistry& Jalal, 2012].The lack of open government in Iraq has led to further devastation of the economic system of Iraq, the petroleum sector is an opportunity for the future generation and this vision can only be guaranteed by enforcing a strong E-governance system in the sector. As, the extractive industry "is regarded as the country's key source of financial resources and the driver of economic and national development."[EITI, 2014:12]. Adding to corruption from Peter Eigen chairman of Transparency International, "corruption is a major cause of poverty as well as a barrier to overcoming it."(Transparency International's (TI) Corruption Perception Index 2005). Addressing Iraq as a country suffered for more than two decades from security and ethno-sectarian, Iraq has worst performance in the governance and economic growth, as Prime Minister Al-Maliki in 2006 defined corruption as the threat to state building and the nation's second insurgency. [SIGIR, 2013].

The public of Iraq has been pressuring the government for serious reforms for eradicating the systematic corruption, which pervades the Iraqi economy for years. The E-Government aims for more transparency and accountability of the government. The quota system in the Iraqi new cabinet under Al-Abadi faces a systemic crisis, in which the quota system is a structural problem in the system. With the economic crisis undermining the power of the government and the security crisis accumulating since 2014, Moqtadar Sadr was a stimulator and champion for triggering change in the government and presenting the anger of the public for anti-corruption on July 31, 2015. While, Abadi hinted in his speech that Sadr's behavior is not in line with reform, as he has no right to claim that he is defending reform. Furthered, he added that "when someone's institutions and associates are plagued by corruption, then he cannot claim to be fighting corruption, and Sadr is part of the government. [Saadoun, 2016]. In the vacuum of E-Government in Iraq, for the extractive industry transparency, it is necessary to think of media as a toolkit for transparency and openness. Thus, transparency as media openness can contribute to anti-corruption efforts by uncovering cases of misappropriation and nepotism. The Iraqi chronic corruption "exists at the highest levels of government and is sustained by widespread nepotism and clientelism, the climate of fragile institutions in Iraq has encouraged militia and political leaders to create their own support base by redistributing jobs and public funds. Thus, lack of open system, especially e-government "the patronage based on party, family or community determines who gets a job. Indeed, the lack of e-government led to embezzlement of resources, funds, and abuse of the public interest. [Al-Hawat, 2016].

2. Iraq towards E-Government in Extractive Industry the Role of Extractive Industries Transparency Initiative (EITI)

In accordance with the role of the Extractive Industries Transparency Initiative (EITI), the role of EITI is defined in setting "global standard for transparency in the oil, gas and mining industries. The EITI's objective is to achieve a standard for review, analysis and publication of revenue flow between extractive industry companies and governments. In this manner, EITI aims to promote transparency in order to prevent corruption, and to provide citizens with a basis for demanding a fair use of revenue. Importantly, Iraq made a commitment under "the Prime Minister Nouri Al-Maliki in May 2008 to initiate stepping to EITI commitment for enforcing transparency and accountability in the extractive industry in Iraq, in two years by February 2010, Iraq has become candidate in EITI." [EITI, 2014]. The mission of EITI is crucial for Iraq, as for the first time since the discovery of petroleum sector, the Iraqi government accepted to publish data, yet disclosing the data on revenues does not mean Iraq is free from corruption. The EITI is successful in making revenues more transparent and this impact transcends into other areas of the economy. [Oge, 2016]. Apparently, EITI supports the dissemination of information and data from the government, this promotes the government towards openness and pursuing E-Government model for Iraq in the future. The Iraqi government commitment to openness is yet very weak generally in the public sector. However, in petroleum sector, government is more committed especially with EITI, which creates doubts for scholars and citizens. Thus, there is a serious debate on whether Iraq is really transparent and accountable drawn from EITI reports, or it is part of transparency. According to EITI "the government of Iraq committed itself to publishing all revenues from its export sales from the oil sector. In addition, international companies buying oil from Iraq shared the same commitment of publishing what they have paid to the government."[EITI, 2014:12]. In line with this, EITI (2015) brief has emphasized that "Iraq has gone beyond basic EITI reporting requirements by including reconciled oil sales and figures in its reports." While, the Natural Resource Governance Institute (NRGI)'s Resource Governance Index gives Iraq a score of 9/100 for the enabling environment, highlighting the lack of an open budget, low levels of accountability, government effectiveness and rule of law.

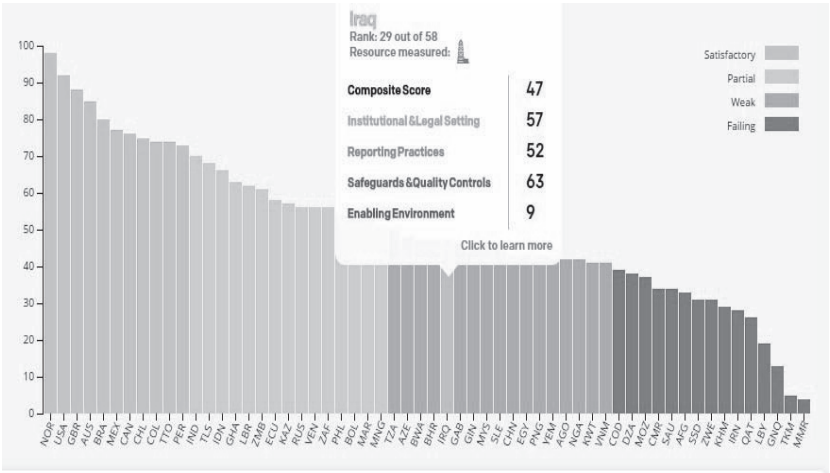


Figure 2

In the rentier states it is difficult for the public to hold the governments accountable, because of disclosure of rents from natural resources. Recognizing, "Publish what you pay" campaign was very interesting for transparency and accountability, because both government and companies were to publish their information on payments to each other and for the public. Importantly, PWYP can help provide a double-entry check on government revenues, since companies' reported payments should match governments reported natural resource revenues from companies (including state-owned companies). [Palley, 2003]. The right to get access to information in Iraq is still under the government's control, and the right of citizens to access information is not considered as a mechanism for creating transparency especially in the extractive industry. Protecting the right of citizens is the responsibility of the government, commitment to open government means government advocates the freedom of information to citizens regardless of the sector, but there are many controversies about petroleum sector information, petroleum sector has secrecy history in Iraq. The institutional infrastructure for open government is vulnerable to political and ethnic tension in Iraq, drawing on freedom of information in Iraq is more related to the media, the main attempt towards open governance and transparency is made in July 2009, "the Journalistic Freedom Observatory in Iraq called upon the Constitutional Review Committee of the Council of Representatives, and The Office of Constitutional Support (OCS) of the UN Assistance Mission for Iraq (UNAMI) to conclude constitutional provisions that grant the right of individuals to access information held by the state." [WNA, 2009]. In responding to "the need of access to information and openness, Tamken, a group of experts, journalists, and academics, drafted the "Information Access Right Draft Law" in late 2009. [Article 19 Global Campaign for Free Expression, 2010]. Article 19 commented on the draft law and suggested a number of amendments to ensure the bill's compliance with international standards. Few important amendments were proposed since some crucial provisions were missing. Such as; the Draft Law does not refer to "public interest." In line with this, few important recommendations are emphasized, including; "guarantying the right of everyone to access information, securing the right to get information, availability of information for the public, in reviewing the disclosure of information private bodies to do independently of government. Insofar, the right of access to information is fundamental human rights right, which is stipulated in "International Human Rights Law and the Anti-Corruption Conventions that signed by the Iraqi government. Overall, the aim of this law is to promote "openness in the government." [Iraqi Constitution/article 19, 2005].

2.1 E-Government as a tool for anti-corruption in Iraq

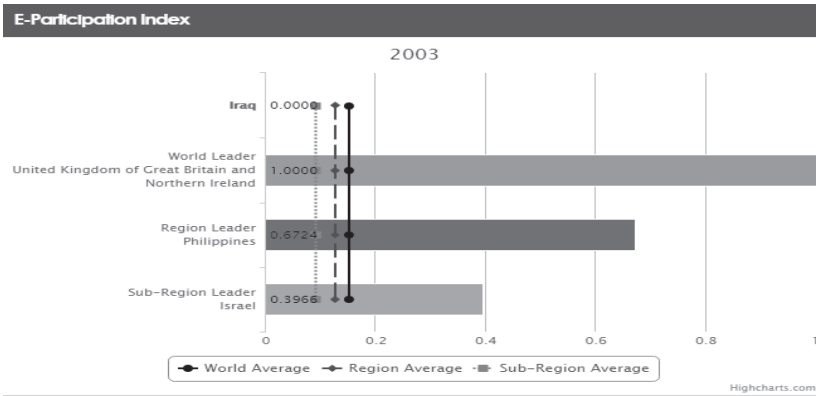
According to UNDP (2006) Electronic Government (e-Government) refers to government's use of ICTs to work more effectively, share information and deliver better services to the public. Moreover, a well-planned e-government strategy can make leaps into building a more efficient, accountable and transparent government. Accordingly, combating corruption is complemented with: strategies to reduce corruption include:

- *Prevention: reform administrative procedures, accounting and procurement practices.*
- *Enforcement: institute proper record-keeping and put in place an effective system of surveillance and enforcement.*
- *Access to Information and Empowerment: promote access to information and enable public and media oversight.*
- *Capacity Building: strengthen governance systems and processes, and provide training*.

In the light of this, E-governance is already being used around the globe to lower instances of corruption. Moreover, ICTs are mainly used by governments for ridding the public sector of corrupt practices, and it urges transparency and accountability by encouraging the reporting corruption. [GTC, 2015]. Accordingly, E-Government can cut corruption, and increases transparency and access to information, the digital government performance in Iraq is still at the beginner phase. When can e-government be effective in the case of a fragile state like Iraq, as Kjar (2004) pointed out that governance in weak states is often an uphill task, economic governance in these states is about managing institution that have often developed in such a way that they constitute obstacles to development. In fact, using ITC since early 1990s got serious importance from the private sector to deliver service to customers effectively and efficiently, thus governments considered this opportunity to install e-government to strengthen the public sector and electronic service delivery, as an easy channel of communication with citizens, e-government has targeted to enhance service to business and citizens, and promote participation and democracy. [Rowley, 2011]. Indeed, Iraq is one of the developing resource abundant countries that have the dubious increase of corruption with each year passing. Comparing Iraq as an abundant natural resource country to the Asia-Pacific region, which perform much better in delivering services electronically and adopting e-government, Iraq is far lagging behind in e-governance. In this way, Iraqi E-governance and E-government in fact has the different historical background, since 2003 Iraq is open to "ICT" and modern technology "for the public" since the Iraqi Ba'ath regime has restricted the use of ICT till 2003. Thus, Iraqi exposure to e-government is a decade late compares it to the rest of the world. The first new Iraqi interim government in 2004 has signed a Memorandum of Understand between the Iraqi Minister of Science and Technology and the Italian Minster for Innovation and Technology. According to the Memorandum, the Italian Government commits to provide technical and financial assistance for the construction of an Intranet linking the ministries of the new Iraqi Administration and built an e-Government project. (Al- Dabbagh, 2011). Noted, it is known that the first initiative was in 2004, in which the Iraqi institutional capacity was entirely collapsed due to the wars, and security, as a result the project failed. Once again the United States Agency for International Development (USAID) and the Iraqi Ministry of Science and Technology put a strategy from 2007-2010 for developing the Iraqi electronic government, from USAID (2007), accumulated that "the entire process needs to be carefully supported, resourced and funded." Besides, Iraq needs to coordinate its e-government strategy with project implementations in order to compete in the region, and to be recognized as a country serious about the public sector reform.[USAID, 2007].

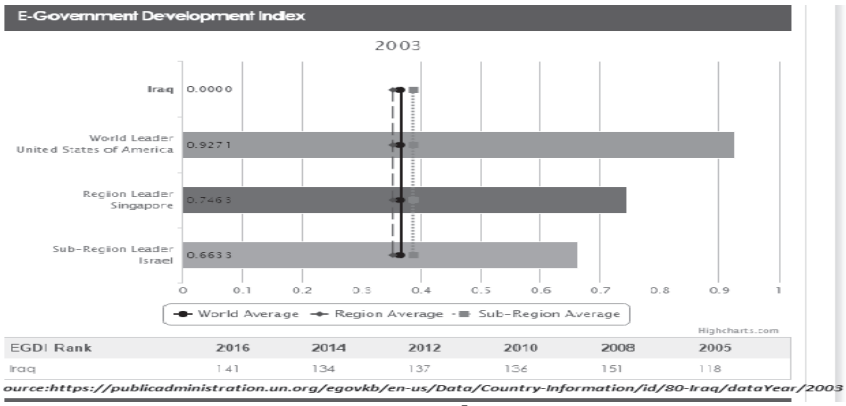
During the 23 years since the Iraqi liberation, the government is floated with websites and the goal is not to reduce the paperwork, yet approaching a paperless administration is not the target for the government in practice yet. Adding, it is crucial to realize why the Iraqi government failed, since the E-Government project was supported by the US government and Italy initially? Indeed, mentioning the reasons of the Iraqi E-government failure is centered on the lack of proper infrastructure, human capital, and resources, yet the country's situation is peculiar with an ongoing crisis and chaos, which has paralyzed the government attempts for innovation and ICT development. Basically speaking, the phases of adopting E-government is proposed in 2002 by the United Nations and the American Society for Public Administration, the model consist of five stages, including: the "emerging state: in this stage an official online government presence is formed, in the following stage it is "enhanced "here the number of government sites increases and become more dynamic. The "interactive" stage is more progressive in fostering interaction of users and the officials through the Web. Then in the "transactional" stage, the users have ability to make online transactions. Lastly, the "seamless" stage which makes the integration of electronic service across the government agencies possible. [Yildiz, 2007]. To evaluate the Iraqi performance in Open Government, open data in the frame of E-Government, it is crucial to look at the E-Government

Readiness Index; which is among the most accurate indices in the world for tracking the aspects of e-governance globally. In more detail, this index assesses the e-government readiness of the 193 selected countries, according to a quantitative composite index involving the website assessment, telecommunication infrastructure, and human resource endowment. Considering the data for Iraq in 2003 including; E-Government was (0.0000), E-Participation Index was (0.0000), and E-Government Development Index was (0.0000).



EPART Rank	2016	2014	2012	2010	2008	2005
Iraq	104	152	101	135	60	151

Figure 3[4]



EGDI Rank	2016	2014	2012	2010	2008	2005
Iraq	141	134	137	136	151	118

ource:https://publicadministration.un.org/egovkb/en-us/Data/Country-Information/id/80-Iraq/dataYear/2003

Figure 4[5]

In the Revenue Watch Index country ranking, Iraq stands as the first in partial revenue transparency, with a score of 63.8.

[4] See: https://publicadministration.un.org/egovkb/Data-Center.
[5] See: https://publicadministration.un.org/egovkb/Data-Center.

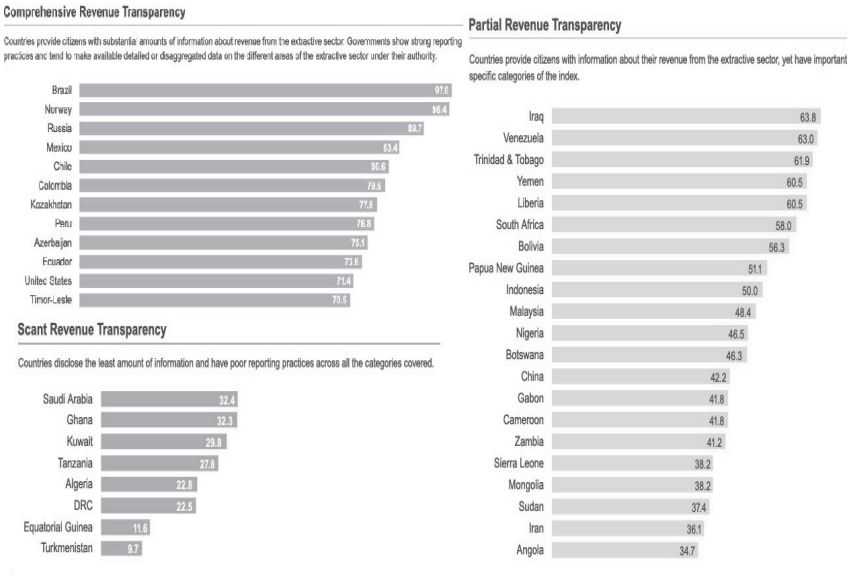


Figure 5[6]

3. Conclusion

The E-government implementation in Iraq has encountered serious milestones; as Iraq encounters political, economic, security, ethnic tension and social challenges, including the lack of infrastructure and technological architecture, and human capital, therefore; to the date the government of Iraq is not able to install E-Government properly, and Iraq is still in the early stages of E-Government development process. In fact, E-Government as a serious measure can reduce corruption especially in the energy sector, which is the source of cash flow that fuels the Iraqi economy. Hence, for the government to protect the public good, cutting corruption and preventing the abuse of public funds is only safeguarded by pursuing E-Government and a transparent approach in the extractive industry in Iraq. It is crucial to remember that the Iraqi membership in EITI is important for the government, the public and globally, because EITI was the first attempt for Iraq for reporting and disclosure of data on revenues generated from energy sector.

4. References

[1] AARON, S. and GILLIES, A.: Initial Evidence of Corruption Risks in Government Oil and Gas Sales, EITI Briefing/ Natural Resource Governance Institute, June, 2016, p.10.

[2] ALNASRAWI, A.: Iraqi: economic embargo and predatory rule, CASI, May, 2000, available online at: http://www.casi.org.uk/info/alnasrawi9905.html. (Accessed on December 12, 2016).

[3] HAMA, A.: adhere to laws to weed out corruption, the National, August 10, 2016, available online at: http://www.thenational.com.pg/adhere-to-laws-to-weed-out-corruption. (Accessed on December 28, 2016).

[6] See: http://www.revenuewatch.org/rwindex2010/rwindex.html.

[4] KJAR, A.M.: Governance, key concepts, Malden/MA. USA, Polity Press, 2004, p. 140.

[5] Anti-corruption, UNDP February 2004, cited in: Jenny,Balboa.,&Erlinda, M. Medalla. anti-corruption and governance: the Philippine experience, APEC Study Center Consortium Conference, Ho Chi Minh City, Vietnam May, 2006, 23-24.

[6] Article 19 Global Campaign for Free Expression, Legal Analysis of draft law on the Right to Access Information, January 2010. Available at: http://www.article19.org/pdfs/analysis/iraq-analysis-of-draft-access-to-information-law.pdf.

[7] BBC, War-torn nations 'most corrupt, November 17, 2009, available online at: http://news.bbc .co.uk/2/hi/8363599.stm. (Accessed on December 15, 2016).

[8] BUENO DE MOSQUITA, B.: The war trap, New Haven, the United States of America, Yale University Press, 1981, p. 3.

[9] CARMODY, P.: Cruciform sovereignty, matric governance and the scramble for Africa's oil: Insights from Chad and Sudan, *Political Geography*. Vol. 28. Issue 6. 2009.

[10] CleanGovBiz Initiative, the rationale for fighting corruption, Organization for Economic Co-operation and Development, Paris France, 2014.

[11] CNN, Sanctions send Iraq on downward spiral, July 12, 1999, available online at: http://edition.cnn.com/WORLD/meast/9907/12/iraq.sanctions/. (Accessed on December 27, 2016).

[12] Corruption Perception Index, 2015, available at: https://www.transparency.org/cpi2015.

[13] DREZNER, D. W.: The sanctions paradox, Cambridge, UK, Cambridge University Press, 1999, p.13,.

[14] EITI Brief, the EITI, NOCs & the first trade, issued by EITI International Secretariat, Oslo, Norway, 2015, p.10.

[15] EITI Iraq Oil Revenues 2012, oil export, local consumption and field development, December, 2014.

[16] FAO/World Food Program, FAO/WFP Crop and Food Supply Assessment Mission to Iraq, Rome, FAO. 1993. In Abbas, Alnasrawi, Iraqi: economic embargo and predatory rule, CASI, May, 2000, available online at: http://www.casi.org.uk/info/alnasrawi9905.html. (Accessed on December 12, 2016).

[17] GTC, how ICT is cutting out corruption, February 25, 2015 available online at: http://blog.thegtcgroup.com/how-ict-is-cutting-out-corruption. (Accessed on December 10, 2016).

[18] BAUMANN, N., AKBAR, S.A., SCHULBERG. J. and BLUMENTHAL, P.: Unaoil's huge new corporate bribery scandal explained, The Huffington post, March 30, 2016,

available online at: http://www.huffingtonpost.com/entry/unaoil-scandal-explained_us_56fbd2f 0e4b0daf53aee0cff. (Accessed on December 10, 2016).

[19] Iraq Corruption Report, Iraq, May, 2015. Available online at: http://business-anti-corruptioncom/country-profileiraq. (Accessed on December 11, 2016).

[20] JAMSHED, J.M. and ABU, J.: An empirical analysis of the relationship between e-government and corruption, the International Journal of Digital Accounting Research, Vol.12, pp (145-176), 2012, available online at: http://www.uhu.es/ijdar/10.4192/1577-8517-v12_6.pdf.

[21] BALBOA, J.,E., MEDALLA, M.: Anti-corruption and governance: the Philippine experience, APEC Study Center Consortium Conference, Ho Chi Minh City, Vietnam May 23-24, 2006.

[22] JOSEPH, R.: *Epilogue, the logic and legacy of prebendalism in Nigeria*, in: Wale, Adebanwi., & Ebenezer, Obadare. (eds.). Democracy and Prebendalism in Nigeria, Critical interpretations, New York, the United States, Palgrave Macmillan 2013.

[23] KEOHANE, R.: Institutional theory and the realist challenge, after Cold War, in David Baldwin, ed. Neorealism and neoliberalism. The Contemporary Debate, New York, Colombia University Press, 1993.

[24] KEREM, O.: Which transparency matters? Compliance with anti-corruption efforts in extractive industries, Resource Policy/ Elsevier, 2014, pp, 41-50.

[25] Weber M., RICHARD, J.: Prebendalism and dysfunctionality in Nigeria, Africa Plus, July 26, 2013, available online at: https://africaplus.wordpress.com/2013/07/26/prebendalism-and-dysfunctionality-in-nigeria/#_edn14. (Accessed on December 14, 2016).

[26] Memorandum on the Draft Access to Information Draft Law of Iraq – ARTICLE 19, London, 2010 – Index Number: LAW/2010/01/Iraq, available online at: https://www.article19.org /resources.php/resource/331/en/iraq:-constitution.

[27] AL-DABBAGH, M.: Electronic Government in Iraq: challenges of development and implementation, Project work, summer, Swedish Business School at Orebro University, 24 August, 2011.

[28] SAADOUN, M.: Iraq's civil movement breaks Sadr Protests, Al-Monitor, July 31, 2016, available online at: http://www.al-monitor.com/pulse/originals/2016/07/sadrists-protests-civil.html. (Accessed on December 24, 2016).

[29] KARAM, P.: Oil identity politics and the struggle for reform in Iraq, April 6,2016, Natural Resource Governance Institute, available online at: http://www.resourcegovernance.org /blog/oil-identity-politics-and-struggle-reform-iraq. (Accessed on November 17, 2016).

[30] COCKBURN, P.: Why Iraq is now the most corrupt country on the planet, June 29, 2009, available online at: http://www.counterpunch.org/2009/06/29/why-iraq-is-now-the-most-corrupt-country-on-the-planet. (Accessed on December 24, 2016).

[31] LE BILLION, P.: Corruption, reconstruction and oil governance in Iraq, Third World Quarterly, Vol. 26, No. 4/5, 2005.

[32] ROWLEY, J.: E-Government stakeholders—who are they and what do they want? International Journal of Information Management, 2011, pp,53–62.

[33] Al-Hawat, S.: Walking a tightrope: the dilemma of the anti-corruption campaign in Iraq, Guacu, March 9, 2016, available online at: http://weareiguacu.com/walking-a-tightrope-the-dilemma-of-anti-corruption-campaign-in-iraq. (Accessed on December 27, 2016).

[34] Special Inspector General for Iraq Reconstruction (USA), Final Report - March 2013 available at:http://www.sigir.mil/files/learningfromiraq/Report_-March_2013.pdf.

[35] The World Bank, Helping countries combat corruption, the role of the World Bank, September, 1997.

[36] PALLEY, T.I.: Lifting the natural resource curse, Global Policy Form, December, 2003, available online at: https://www.globalpolicy.org/the-dark-side-of-natural-resources-st/water-in-conflict/40112.html. (Accessed on December 17, 2016).

[37] UNDP, fighting corruption with e-Government application, APDIP, e-Note 8, 2006.

[38] United Nations Convention against corruption, United Nations Office on Drugs and Crime, United Nations, New York, 2004.

[39] United Nations E-Government Survey, E-Government in Support of Sustainable Development, United Nations Department of Economic and Social Affairs, 2016, p.103.

[40] USAID, Government of Iraq E-Government strategy 2007-2010, USAID-Funded Economic Governance II Project Bearing Point Inc, 2007.

[41] USAID-Funded Economic Governance II Project Government of Iraq e-Government Strategy, June 20, 2007

[42] VAN DEL. WALLE, N.: The path from neopatrimonialism: democracy and clientelism in Africa today, working paper series No.3-07, Mario Einaudi Center for International Studies, 2007.

[43] Adams, W. and Brock, J.W.: The bigness complex, industry, labor and government in the American economy, (2nd ed), California, Stanford University Press, 2004, p.71.

[44] WNA news, the Committee on Constitutional Amendments and internationalists experts are required to approve the right of access to information, 2009, available online at: http://www .wna-news.com/inanews/news.php?item.24722.7 (Arabic, accessed on March 02,2017)

[45] LEOPOLD, W.: Is prebendalism a global phenomenon today? January 17, 2014, available online at: https://news.northwestern.edu/stories/2014/01/is-prebendalism-a-global-phenomenon-today. (Accessed on December 26, 2016).

[46] YILDIZ, M.: E-government research: reviewing the literature, limitations, and ways forward," Government Information Quarterly, Vol. 24, 2007, pp. 646-665.

Open Data

OPEN LEGISLATIVE DATA: FROM UKRAINIAN PERSPECTIVE

Nadiia Babynska (Virna)[1]

Abstract
Structured, open by default, accessible, timely data are important source for understanding the parliament, engaging citizens to legislation processes, political analysis and prognosis. Data about voting, MPs, finance and legislation-flow in the parliament are vital and having access to the whole bulk of data – is the main source of information for researchers, journalists, think tanks, parliament itself.

Parliaments all around the world produce terabytes of information each year. These are voting records, drafts of laws, legislation, amendments, information about plenary session meetings, speeches, videos, photos, financial information etc. Is this information used by parliament, think tanks, other stakeholders? Or is it hidden in the shelf in offices of parliamentarian clerks?

In this article author tries to explain the importance of open legislative data, how they can be used by and for society. Nadiia Babynska describes her path on opening parliament data in Ukraine, failures and successes in this process. Nadiia Babynska shows the initial need of open legislative data for good governance, engagement citizens, transparency and anti-corruption in parliament. She proposes the main steps to make parliament data open.

1. Legislative openness and open data

Access to information, openness, transparency, citizens engagement. These are the key features of open society. All these processes could be passive: citizens write requests for public information and state bodies (parliament, government, local authorities) give it, citizens want to attend plenary meetings, visit state bodies, influence on decision making processes and they receive it on the demand. All these processes could be proactive as well.

If state body (legislation, government, municipality) decides to be proactively open it publishes the whole data it produces and gathers (despite of sensitive information, of course). Data are published in machinereadable format, accessible, free for reuse and timely. This is open data.

According to The International Open Data Charter [1] "open data is digital data that is made available with the technical and legal characteristics necessary for it to be freely used, reused, and redistributed by anyone, anytime, anywhere".

Government, parliament, municipality can produce millions of documents and publish it on their portals is not open data format. In this case it makes the work with this information harder and longer. First, researcher or other analyst have to spend hours and days to digitalize all documents

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for making it machinereadable data. This means that computer, program can not work with this information directly. It is not only about openness of data. It is about open data as a format.

There are a lot of progress in open data on the governmental level and on the city level as well. There are at least two big global initiatives that measure the open data development (Open Data Barometer [2] and Global Open Data Index [3]). They are focused on government data. There is also the Local Open Data Census [4] developed "to survey and compare the progress made by different cities and local areas in releasing open data".

It is very little interest to legislative data though. This is very strange as the legislative data are crucial for understanding what is going on (laws), will be going on (drafts of laws), who decides the main questions (members of parliament (MP) in the country, how state money are going to be spent (budget development, finance) and what kind of interests MPs have (voting records, speeches etc). Lack of interest to the data that produce parliament which is representing the electorate, making laws, and overseeing the government [5] leads to lack of fundamental information and understanding, tools for explaining parliamentarian processes and logic.

Legislative data are as important as information about the fuel for the car (even if we know everything about its specification, details).

Open legislative data – is an instrument for analyzing parliamentary processes, monitoring MPs and committees, oversight and accountability. Open legislative data products help citizens understand how parliaments work, involve citizens in legislation, explain the law-making logic, develop and increase their political culture.

In 2016 me with my colleague Grygorij Sorochan explored open data in parliaments around the world ("Open Parliament Data: from a trend to a necessity")[6]. The parliaments of Austria, Bosnia and Herzegovina, Brazil, Bulgaria, Chile, Costa Rica, Czech Republic, Denmark, France, Italy, Norway, Paraguay, Russian Federation, Sweden, Switzerland, Ukraine, United Kingdom and Scotland have their own websites or special sites dedicated to open parliament data. Open data portal of British Parliament [7] is one of the best. It contains 34 groups of data sets, and the number is constantly increasing. The portal contains information about electronic petitions, electoral constituencies, agenda, voting results etc.

Open data portal of French Senate [8] contains four large data sets (law-making, amendments, questions and reports), as well as information about MPs and election outcomes.

Sweden Parliament [9] has 200,000 documents available on its portal, dating from 1971. For example, calendar, list of speakers, legislation, information about MPs, voting results, and speeches of MPs.

Norwegian Parliament's open data website [10] contains information about voting, legislation, questions and representatives.

The European Parliament does not have its own open data portal. 51 datasets about the European Parliament are published on the European Union Open Data Portal [11]. There are mostly results of surveys and very little information in machine-readable format on legislation, MEPs etc.

Open data portals of parliaments should have such kind of functions as raw data download, use of an API (application programming interface), examples of using open data, support, consulting and trainings for users.

Open legislative data are used by parliaments itself as well as parliament monitoring organizations (PMO) for developing different products on the base of open legislative data. For example, The Law Factory / La Fabrique de la Loi [12] in France (tracking the evolution of a legislative initiative), They Work For You in UK, They Vote For You in Australia and Ukraine (gives statistical information per faction or an MP to see whether he is consistent in his choices, who votes contrary to his faction's policy etc.)

There is a lot about open data in the annual report on e-parliament, conducted by Inter-Parliamentary Union. Researchers admit in the World e-parliament report 2016 [13], that "open data heralds a potentially seismic shift in the relationship between parliament and citizens. No longer is the citizen solely a recipient of broadcast information, whether from parliament, members or the media. Today many are able to participate because of access to the information, documents and data that parliaments generate. Making documentation and content more available is a critical trend too, whether this is through web-based technologies or through open data".

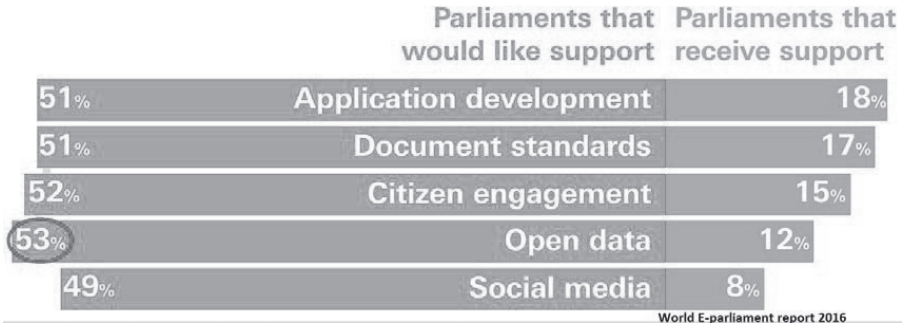

Figure 1: What kind of support would parliaments around the world like to have and have indeed according to "World E-parliament report", 2016

2. Open legislative data in Ukraine

Parliamentary openness in Ukraine became the public commitment of Verkhovna Rada (Ukrainian Parliament) on February 2016. Ukrainian parliament has joined to the global open parliament movement by endorsing the Declaration on Parliamentary Openness [14]. The National Action Plan [15] on the implementation of the main principles was developed and adopted by the order of the Chairman. Verkhovna Rada took 21 commitments to become more open and transparent, One of the main chapters of Declaration is "Technology and Innovation". According to this chapter parliament data should be open by default and the Open data portal should be developed and sustained by the ICT department of Administrative office of Parliament ("Providing public access to data sets in the form of Open Data on Parliament's web-resources").

In the National Action Plan is written, that "the Resolution of the Cabinet of Ministers of Ukraine No. 835 of 21 October 2015 "On approval of the Regulation on Data Sets to be Published in the Form of Open Data" establishes the obligation of the Ukrainian Parliament to provide public access and timely updates of data sets on its official web-resources within six months. Thus, by April 2016

the Administrative Office of the Ukrainian Parliament must publish its datasets in formats provided by the Regulation:

- Guide of companies, enterprises (institutions) and organisations of the administrator and its lower organisations, including their phone numbers and addresses
- Staff schedule of the administrator
- Report on use of budget funds (for administrators using the budget funds), particularly, for individual budget programmes
- Standards approved by the administrator of information
- Lists of national standards, which, in the event of their voluntary application, present evidence of compliance of products with the requirements of technical regulations
- Reports on inspections and other control measures undertaken by the administrator
- Annual procurement plans
- Accounting system of documents of the administrator under the Law of Ukraine "On Access to Public Information"
- Register (list) of the open datasets
- Lists of administrative services, information cards of the administrative services and application forms required for applying for the provision of the administrative services
- Information on treasury bills for payment for administrative services
- Administrative data collected (processed) by the information administrator
- Legal acts to be disclosed pursuant to the Law of Ukraine "On Access to Public Information"
- Financial statements of the economic entities in the public sector of the economy, which are within the scope of management of the information administrator
- Legal framework of Ukraine (Database "Legislation of Ukraine")
- Information on consideration of the agenda of Verkhovna Rada of Ukraine
- Information on the bills registered in Verkhovna Rada of Ukraine

To ensure access to public information, it is also encouraged to provide access to those data sets that are not included in the list specified by the Regulation, unless otherwise provided by the Law of Ukraine "On Access to Public Information". This especially applies to information of considerable public interest (high frequency of questioning, reflecting results of public opinion polls, etc.). Since any information about the activities of Parliament is of considerable public interest, all the data

published on Parliament's website shall also be published as Open Data. To enable this, a separate "Open Data" section should be created on the website of the Verkhovna Rada of Ukraine.

The "Open data by default" principle should also be provided during the design and creation of new information systems on Parliament's website".

In April 2016 Open data Portal Ukrainian Verkhovna Rada [16] was presented. It consisted of more than 100 datasets about Ukrainian Parliament and open API. There is mostly structured, updated information on plenary session meetings, MPs, voting records, legislation and drafts of laws. This information is in open data format. Meanwhile, there is also financial information and information about staff not in machine readable format. There is also questions about sustainability and support of other datasets that has automatic updating.

There is no chief open data officer for sustaining the portal, no access to other databases despite of legislation, plenary meetings, MPs (financial information, information about committees etc.), lack of technical competencies of IT-staff in the parliament and, the main, understanding of importance of open legislative data in the Ukrainian parliament. No inner regulations in Parliaments makes this question out of the agenda.

As a project manager of Open Data Parliament Portal development, now I see the main challenges and obstacles on the path of open legislative data development. That is why I have some suggestion about that.

3. How to open legislative data

Open legislative data need political will and technical capacity, as well as the users of these data. It means – ecosystem of open legislative data.

Political will mean that the open data as a principle is officially defined (order, resolution etc). There should be the chief open data officer (responsible for open data in Parliament) and direct finance for open data (salary, good equipment, good and sustainable data bases), competences and motivation of IT-department as well as strong, data-savvy and motivated PMO.

It also good than besides political will and finance there is also the legislative framework for open data (in laws or other normative documents that is obliged for fulfillment by every state body).

The crucial thing to do before starting open legislative data process is to have deep assessment for getting awareness on state of data bases, equipment, competencies of IT-staff etc. The World Bank's Open Government Data Working Group developed the Open Data Readiness Assessment (ODRA) [17] methodological tool. It can be used to "conduct an action-oriented assessment of the readiness of a government or individual agency to evaluate, design and implement an Open Data initiative".

The second question is what kind of data have to be open primary. This is a question that parliament should address to stakeholders. There should be a constant communication with PMOs, think tanks etc about what kind of data, in which exact format and updating regularity open data should be published by the parliament.

Typically, parliaments publish such kind of data as:

1) *voting records* (one of the most important dataset as it is used to discover real policy making and real political interests). Ukrainian product of Civil network OPORA for surfing voting records in user friendly interface Rada4you [18]

2) *speeches* (parliament speaks: during plenary sessions, hearings, government hours etc. there are millions of words are spoken). Ukrainian instrument of Civil network OPORA for surfing MP's speeches Radastenograma [19]

3) *information about MPs and their assistants* (background, work in and outside the parliament, declarations, conflict of interests, requests, drafts etc Ukrainian product for getting information on MPs and their attendance). Ukrainian products of Civil network OPORA and Civil Movement Chesno [20]

4) *bills* (legislation) – the main information is legislation

5) *drafts of laws* and its passage in the parliament. Ukrainian application for IOS, developed by Civil Movement Chesno ZAKONOPROEKT [21]

6) *information about committees* (attendance, meetings, hearings, voting, conclusions, drafts, protocols, passing drafts of laws there).

7) *financial information* (about MP, offices, assistants, administrative costs).

8) *e-petitions* (what citizens want from parliament, MPs).

These are the main datasets that should be primarily open by the parliament. But what kind of open data format it should be published? According to World e-parliament report 2016 [22], 80% of documents in parliaments all around the world are published in PDF format which is not the format that can call easily to be read by machine.

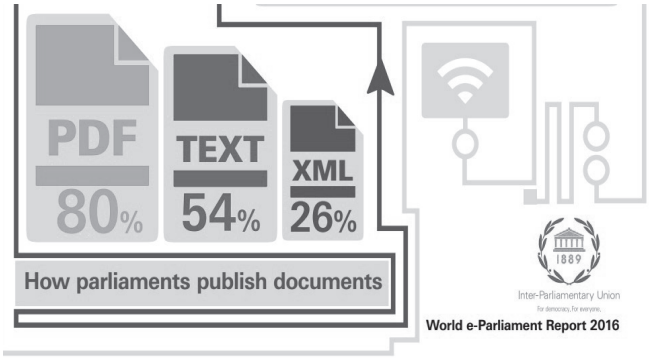

Figure 2: Formats in which parliaments publish its documentsaccording to "World e-Parliament Report", 2016

Tim Berners-Lee, the inventor of the Web and Linked Data initiator [23], suggested a 5-star deployment scheme for Open Data.

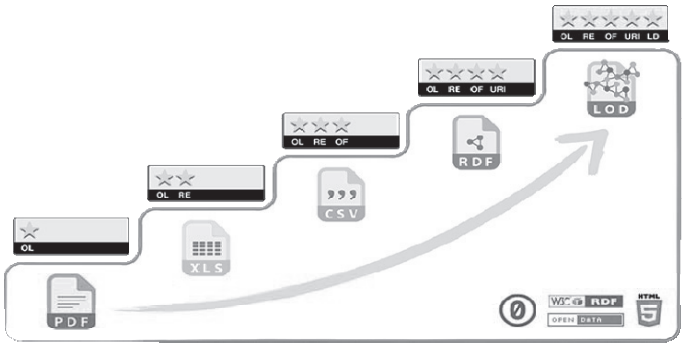

Figure 3: Types of open data according to Tim Berners-Lee's classification

As we can see, PDF – is the lowest level of open data format. It is better to use Extensible Markup Language (XML), JavaScript Object Notation (JSON) and comma-separated values (CSV) formats for open legislative data.

Good structure, metadata and description for datasets are as important as data itself. All datasets should have open application programming interface (API) for searching and getting exact data.

The question about the platform to use for datastoring, repositoring and publishing information is also important. Ukrainian open parliament portal is on Drupal based Knowledge Archive Network (DKAN). It is open source platform, as well as Comprehensive Knowledge Archive Network CKAN, which is used by UK parliament. GITHUB - web-based Git repository hosting service [24]. There are also other platforms, but these are more popular and open source platforms.

4. References

[1] The International Open Data Charter, http://opendatacharter.net/wp-content/uploads/2015/10/opendatacharter-charter_F.pdf (as per December 31st, 2016).

[2] Open Data Barometer, http://opendatabarometer.org/ (as per December 31st, 2016).

[3] Global Open Data Index, http://index.okfn.org/ (as per December 31st, 2016).

[4] Local Open Data Census, http://census.okfn.org/en/latest/#cities (as per December 31st, 2016).

[5] Parliament https://en.wikipedia.org/wiki/Parliament (as per December 31st, 2016).

[6] Nadiia Virna, Grygorij Sorochan, Open Parliament Data: from a trend to a necessity, https://www.oporaua.org/en/news/42391-open-parliament-data-from-a-trend-to-a-necessity, 2016 (as per December 31st, 2016).

[7] Open data portal of British Parliament, http://www.data.parliament.uk/ (as per December 31st, 2016).

[8] Open data portal of French Senate, http://data.senat.fr/ (as per December 31st, 2016).

[9] Open data portal of Sweden Parliament, http://data.riksdagen.se/In-English/ (as per December 31st, 2016).

[10] Open data portal of Norwegian Parliament, http://data.stortinget.no/ (as per December 31st, 2016).

[11] European Union Open Data Portal, https://data.europa.eu/euodp/en/data/publisher/ep (as per December 31st, 2016).

[12] La Fabrique de la Loi, http://www.lafabriquedelaloi.fr/ (as per December 31st, 2016).

[13] World e-parliament report 2016, http://www.ipu.org/pdf/publications/eparl16-en.pdf (as per December 31st, 2016).

[14] Declaration on Parliamentary Openness, https://www.openingparliament.org/ (as per December 31st, 2016).

[15] The National Action Plan, http://www.opengovpartnership.org/blog/open-government-partnership/2016/02/08/announcing-open-parliament-action-plan-ukraine (as per December 31st, 2016).

[16] Open data portal of Ukrainian Parliament, http://opendata.rada.gov.ua/ (as per December 31st, 2016).

[17] Open Data Readiness Assessment, http://opendatatoolkit.worldbank.org/en/odra.html (as per December 31st, 2016).

[18] Rada4you, https://rada4you.org/ (as per December 31st, 2016).

[19] Radastenograma, http://radastenograma.oporaua.org/ (as per December 31st, 2016).

[20] Deputaty, https://rada.oporaua.org/deputaty/deputati, http://www.chesno.org/deputies/ (as per December 31st, 2016).

[21] ZAKONOPROEKT, https://itunes.apple.com/WebObjects/MZStore.woa/wa/viewSoftware?id=1093063414&mt=8 (as per December 31st, 2016).

[22] World e-parliament report 2016, http://www.ipu.org/pdf/publications/eparl16-en.pdf (as per December 31st, 2016).

[23] Web and Linked Data initiator, http://5stardata.info/ (as per December 31st, 2016).

[24] Github, https://github.com/SenatoDellaRepubblica/AkomaNtosoBulkData (as per December 31st, 2016).

OPEN ACCESS POLICY TO RESEARCH OUTPUTS IN THE REPUBLIC OF MOLDOVA. STATE OF THE ART AND PERSPECTIVES

Nelly Turcan[1] and Rodica Cujba[2]

Abstract
According to the Registry of Open Access Repository Mandates and Policies (ROARMAP) only 8 research institutions from the Republic of Moldova (12%) approved an Open Access Policy (OAP). All these institutions are universities and none is a research institute or research funder, although research and development activities in the Republic of Moldova are funded basically from the state budget.

The paper contains analysis of the situation regarding Open Access Institutional Policies in the Republic of Moldova. Results of a study regarding the attitude of Moldovan academia to open access to research outputs and identified problems on this issue are presented in this work. Emphasis is given to tools and information systems like Institutional Repositories (IRs) that promote open access for research outputs. The paper reveals the barriers for adoption and / or implementation of an open access policy in a research organization and provides ways for their overcoming.

1. Introduction

Beginning with the second half of the twentieth century, traditional scientific publishing is still increasing although there are big differences between fields. At the same time, publication using new channels, for example conference proceedings, open IRs, open access journals and home pages, is growing fast. The increasing rate and further development of scientific publishing has led to a flood of information which is difficult for a single researcher to access or manage [5]. A description of this situation was made by John D. Bernal in one of his reports „It is easier to make a scientific discovery than to learn whether it was already made".

There have been a number of studies that have examined the growth of journal titles [8, 9, 14]. The huge size of these estimates and their variability has inevitably generated complaints about the flood of literature and its effect on scholarly communication [7]. Thus, it is now more than crucial to select the most important resources so that relevant is not missed.

At the same time, the difficult situation on the information market is worsened by the expansion of the number of scientific publications in digital format. According to the data from Ulrich's Periodicals Directory, in 2014 there were 34,585 reviewed scientific journals, [0] whose number is increasing by over 3% annually [15]. Ernest Abadal notes that in 2013, Ulrich's Periodicals Directory registered 8,000 open access (OA) journal titles, which represents 13.5% of all peer-review journals (60,000 worldwide) [0].

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Currently, the number of open access journals is growing. The number of journals registered in the *Directory of Open Access Journals (DOAJ)* at the end of 2016 was 9,454 journals from 128 countries [0]. The representativeness of open access journals in international databases such as Web of Science (WoS) and Scopus is smaller. From 22,000 journals indexed in Scopus, 2,930 journals (13%) are open access, while WoS includes about 726 open access journals (9%) [0].

Now, access to information is restricted by some permission barriers and by price barriers as well. Because of annual serials price increases, libraries, publishers, and vendors search for innovative ways to fulfil information needs of researchers, faculty members and students.

Alternative models of publishing and open access help provide scientific research outcome and make it possible to unify the entire text in a single informational space which is accessible to all the public. Open access is an innovative way of dissemination and use of scientific information, which is promoted to offer users free access to information. Open access is an alternative to the traditional model of scientific communication, based on digital technologies in the network. These factors influence the transformation of the scientific communication system and change social interactions in the academic environment, as well as between the players involved in the scientific communication – scholar, editor, library and user. At the same time, open access strategies transform the relationships between the actors of the communication process, providing a higher public visibility to research outputs and an increase in the scientists' and country's rating due to the increased number of citations.

Open access is supported by two strategies that provide free and unrestricted access to scientific publications, primarily financed from the public budget. While Gold OA provides a quick and direct access to articles through the websites of open access journals, Green OA provides indirect access to an article or an earlier version of the manuscript which is available on the web at a location other than the website of the journal [0]. Hence, publishers give researchers a free hand to make their publications available through institutional or theme repositories with open access.

While publishing policies are important to clearly define the authors' rights on the previous versions of articles or manuscripts, the content of institutional policies encourages researchers to make their publications accessible for free.

2. Open access institutional policies in the Republic of Moldova

According to the national legislation and the number of open access policies approved at national and institutional level, the Republic of Moldova cannot be called a politically open territory. However, there are some encouraging examples, as well as a positive forecast for the future to support open access in the Republic of Moldova.

In the Republic of Moldova the state policy in the field of science and innovation is carried out under *the Code on Science and Innovation of the Republic of Moldova*, approved in July 2004 [0]. Several articles of the Code assure guaranteed access to scientific information. The state, in accordance with the current legislation, guarantees: support through access to information, through its dissemination; information assurance of the topics from the scientific and innovation field; free and non-discriminatory access to scientific-technological information resources. However, open access to scientific research at state level is not confirmed in the Republic of Moldova, primarily that financed from the public money, and besides this, the mechanisms for ensuring free and open access to the scientific and technological information resources are not specified.

In the Republic of Moldova have been launched several projects to support open access and upgrade information services, in order to improve the quality of academic studies which also focus on open and free access to scientific information.

The Research and Development Strategy of the Republic of Moldova until 2020 [12] sets to accomplish several objectives aimed at reforming the accessibility and dissemination of scientific information, including the increase of public confidence in science and it will foster the citizens' and the civil society's transparent commitment in the research and development areas, by making it easier to access scientific knowledge.

The National Strategy for the Development of the Information Society „Digital Moldova 2020" [13] includes the development and implementation of the *Program on creation, development and exploitation of digital content in the Republic of Moldova*, which implies taking such actions as:

a) facilitating the development of data centres / digital deposits for local content, complying with the standards on content management, conservation and access over time and setting up the public access digital content Register (which will also include the orphan content);

b) publish on the open data portal all the information of public interest in electronic format, from the public authorities, and regulating the publishing and updating of information, representing digital content, as well as procedures for digital content access and use.

Open Access initiatives are being implemented in the Republic of Moldova by Gold OA – the development of an alternative way of publishing via open access journals. Currently, at the national level there are 17 journals registered in DOAJ with open access (date 30/12/2016), but only 12 journals have approved open access policies.

Regarding Green OA, it is supported by the creation of open access repositories and approval of institutional policies on self-archiving the publications of the institution staff. Currently, in the Republic of Moldova there are 12 open access repositories – eight university IRs and one IR of the research institution[3], and three important national research, development and innovation repositories[4]. An accomplishment in promoting and preserving the scientific works in the Republic of Moldova is the fulfilment the main goals of several projects – the creation of IRs supporting the EU standards and protocols regarding the Open Archives Initiative (OAI) and ensuring the efficient dissemination of content. To achieve this goal, seven university libraries from the Republic of Moldova have joined their efforts and decided to act jointly. Thus, in order to regulate the process of organizing and efficient operation of the IRs they created and developed a set of documents including: the open access institutional policy, regulations on the organization and operation of the IR, a contract with the author on the distribution of publications in the repository, the archiving guide of publications in the repository.

Universities from the Republic of Moldova accept and recognize the strategic importance of open access to information; express the vision of the institution regarding the benefits and impact of open access on the academic community and take responsibility to disseminate, as widely as possible, the

[3] The analysis of institutional repositories is presented below in this paper

[4] National repository of e-theses (National Council for Accreditation and Attestation of the Republic of Moldova); National repository of inventions (State Agency on Intellectual Property); National repository of scientific journals and articles published in the Republic of Moldova (National Bibliometric Tool)

findings of scientific activities funded from public budgets and projects based on the principles of open access. Universities also encourage researchers to show their support for open access by submitting their publications in repositories using alternative models of scientific publishing in open access. In order to motivate researchers to provide open access to scientific publications, Moldovan universities have set the objective to register their institutional policies in international registries. University policies which allow open access to scientific research outputs, carried out from public funds, were registered in the *Registry of Open Access Repository Mandates and Policies (ROARMAP)*. Currently, there are 8 open access institutional policies registered in the ROARMAP which belong to universities from the Republic of Moldova.

The analysis of open access institutional policies in 8 universities from the Republic of Moldova revealed that through the open access policies all institutions encourage researchers and teaching staff to submit their works in IRs. Institutional policies mandate the compulsory registration of scientific publications which result from the scientific research, partially or fully, funded by the state. At the same time, some institutional policies stipulate that in case of embargo, the publications developed from state-funded research will be registered in the IRs in 6 months after publication.

All the open access institutional policies support the implementation of open access via two models: self-archiving in the IR as well as publishing in open access journals registered in DOAJ. At the same time, several open access university polices encourage authors to publish with publishing houses that support open access and allow self-archiving in IRs and encourage the teaching and research staff to place the papers published before the approval of the open access institutional policy. Policies require authors to negotiate with publishers the terms of including the publication in IR, provided there are copyright restrictions, so that the publication is included in the repository not later than 12 months after publication.

The national universities are concerned about the quality of scientific publications that creates both a visibility for the institution and an image in national and international scientific environments. Therefore university open access policies authorize the adoption of an efficient peer-review process in order to preserve the quality standards.

Thus, the institutional policies of open access from the Republic of Moldova encourage researchers, grant holders, teaching staff to publish their works in accordance with the principles of the open access paradigm, financed from public money and funds to ensure the long-term preservation of digital scientific works and provide the widest possible access to the scientific works of the academic community.

3. Studies on the attitude to open access to research outputs

In order to learn out about attitude of academia to open access to research outputs, Information Society Development Institute carried out a study in the period November 2015 – February 2016, that consisted of four steps.

Step One: Creation of a working group. During kick-of-meeting main activities and methodology of the study were discussed and approved. It was decided to gather data via survey and to use online tool for questionnaires (Google Forms).

Step Two: Identification of target groups and drawing up, discussion and approve of questionnaires depending on the target group. Four target groups were identified: R&D institutions (research

organizations and universities); libraries (national, universities' and research organizations' libraries); editorial boards of scientific journals; managers of national research projects funded by Government.

Step Three: Identification and invitation of target groups' representatives to fill out questionnaires. The online questionnaires were available online between 20 November 2015 and 20 January 2016 and enabled the collection of the responses from 39 R&D institutions (success rate: 75 %); 48 editorial boards of scientific journals (success rate: 63%); 83 managers of national research projects (success rate: 34%); 23 libraries (success rate: 71%).

Step Four: Data processing, analysis and drawing conclusions.

The study's outputs revealed that majority of scientific institutions agree that scientific works should be in open access, albeit after a period of embargo (fig. 1).

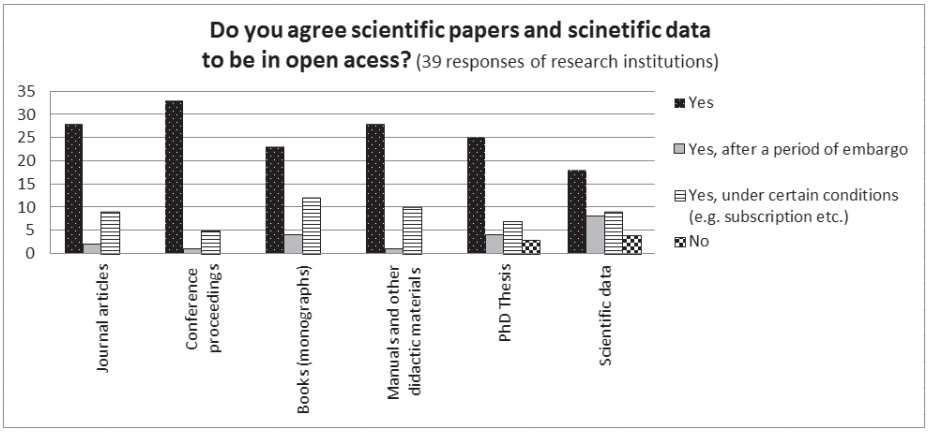

Figure 1: Opinion regarding the open access to scientific publications and research data

At the same time the majority of project managers confess that they prefer hard copy for dissemination of research data and only 15% of project managers are ready to disseminate their research outputs using open access (fig. 2).

Figure 2: Opinion regarding dissemination of research data

Although 74% of scientific journals have approved open access policy (fig. 3) and 87,5% of them publish articles simultaneously in hard copy and digital format (fig. 4), only 8% of representatives of

scientific institutions confess that have no problem regarding access to scientific publications in Moldova (fig. 5).

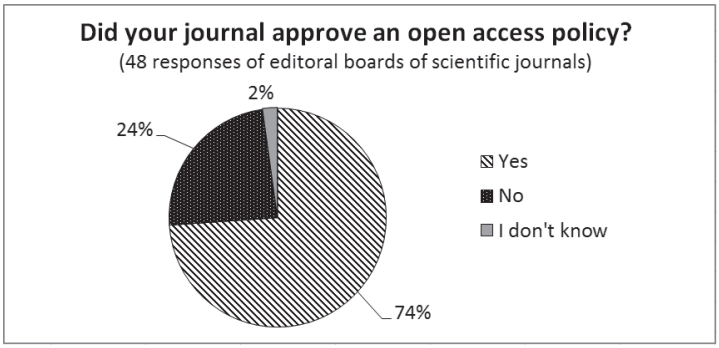

Figure 3: Approval rate of editorial open access policy

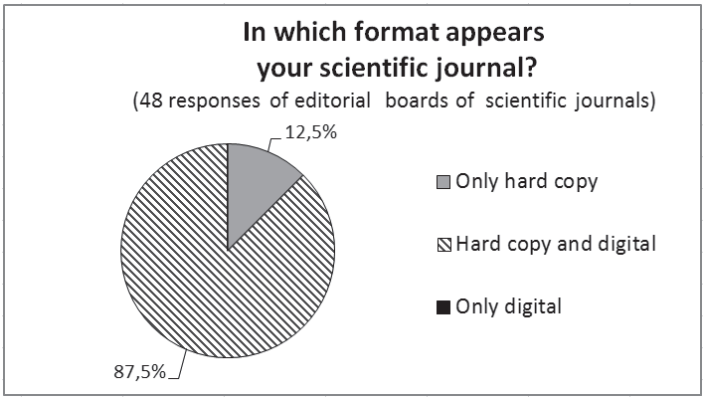

Figure 4: Opinion regarding publishing format of scientific journal

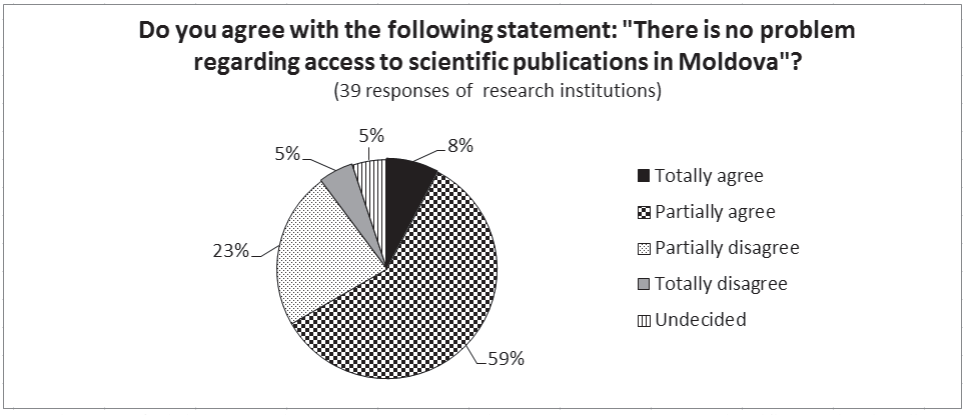

Figure 5: Opinion regarding statement „There is no problem to access scientific publications"

The problem with open access to scientific publications is confirmed by libraries – only 7 of them (or 29%) have between 81% and 100% of digital resources available on-line (fig.6).

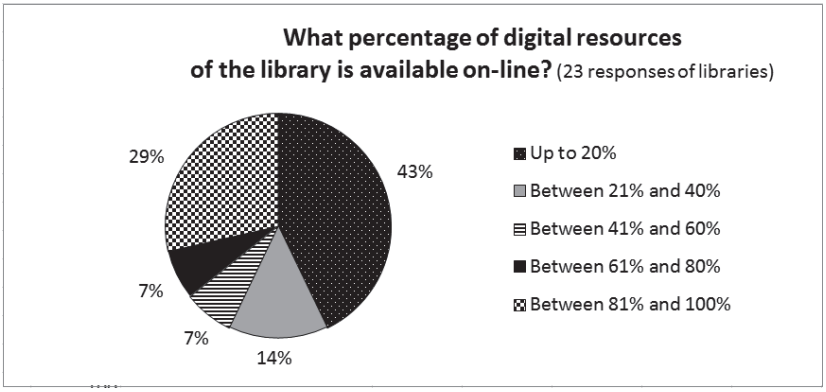

Figure 6: Rate of digital resources of the library available online

The representatives of scientific institutions showed that the most important two barriers to access to scientific publications are absence of motivation to increase access and limited or reduced library budgets. But also important barriers are high prices for subscriptions; lack of interest to scientific publications; insufficient national strategies/ policies on open access (fig. 7).

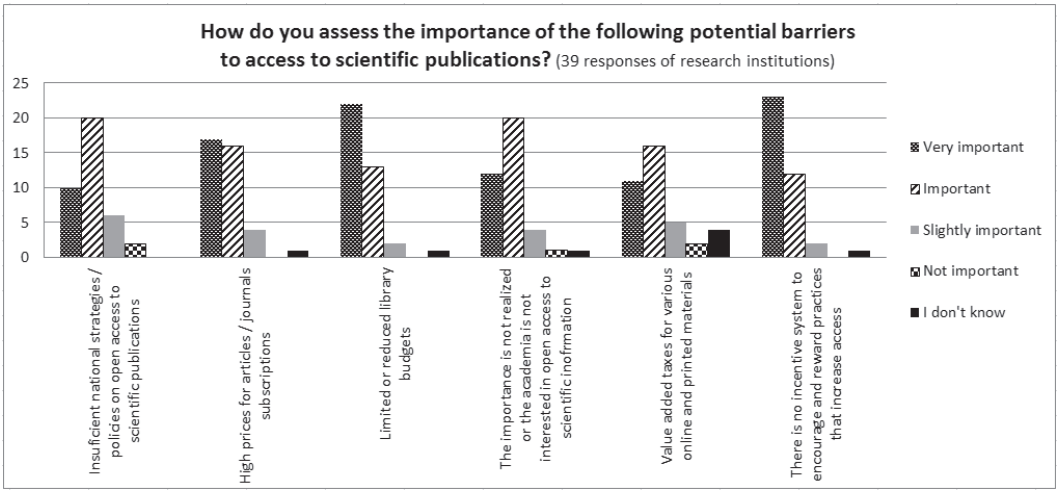

Figure 7: Opinion regarding barriers to accessing scientific publications

4. Analysis of institutional repositories with open access

Aiming to increase international visibility and to be included in the international circulation of information and knowledge, the repositories from the Republic of Moldova are recorded in international registers. Thus, the *Directory of Open Access Repositories (OpenDOAR)* has recorded six IRs and one national repository [10] and the *Registry of Open Access Repositories (ROAR)* provides information on 8 IRs and one national repository [11]. A national open access repository that is included in both registers is the repository of PhD e-thesis[5].

[5] National repository of e-theses (National Council for Accreditation and Attestation of the Republic of Moldova)

Another identified IR that is not registered yet in any international registry, belongs to a research institute of the Academy of Sciences[6]. More detailed information is presented in table 1.

No	Repository	OAP registration	Registration in ROAR	Registration in DOAR
1.	IR in Medical Sciences of Nicolae Testemitanu State University of Medicine and Pharmacy (IRMS – SUMPh)	ROARMAP ID: 1054 2016	ROAR ID: 11253 10.05.2016	OpenDOAR ID: 3713
2.	Open Research Archive of Alecu Russo Balti State University (ORA USARB)	ROARMAP ID: 999 16.09.2015	ROAR ID: 11083 6.04.2016	OpenDOAR ID: 3714
3.	IR of Economic Knowledge of the Academy of Economic Studies (IREK – AESM)	ROARMAP ID: 1009 24.12.2012	ROAR ID: 11736 22.09.2016	OpenDOAR ID: 3715
4.	IR of State University of Moldova (IR – MSU)	ROARMAP ID: 1062 01.12.2015	ROAR ID: 11352 26.05.2016	OpenDOAR ID: 3738
5.	IR Agricultural Sciences (IRAS – SAUM)	ROARMAP ID: 945 27.11.2015	ROAR ID: 10802 2.02.2016	OpenDOAR ID: 3623
6.	IR of Technical University of Moldova (IRTUM)	ROARMAP ID: 1069 26.01.2016	ROAR ID: 11541 25.07.2016	-
7.	IR of Free International University of Moldova (IR – FIUM)	ROARMAP ID: 1001 16.04.2014	ROAR ID: 10961 3.03.2016	-
8.	Digital IR of State Pedagogical University (DIR – SPU)	ROARMAP ID: 1128 31.10.2013	ROAR ID: 11733 22.09.2016	OpenDOAR ID: 3716
9.	Repository of Socio-Economic Sciences of the National Institute for Economic Studies (RSES – NIES)	-	-	-

Table 1: Open access IRs from the Republic of Moldova in international registers

All repositories are based on DSpace Software and have similar features. All documents are distributed per communities and collections, issue date, authors, titles, subjects. All repositories have search tool with possibility to filter documents by title, issue date and submit date.

[6] Institutional repository of the National Institute for Economic Studies (RSES)

No	Repository	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
1.	IRMS – SUMPh	1	3	5	1	5	2	4	6	6	8	227	421	497	495	290	312	**91**
2.	ORA USARB		1	1	7	6	161	53	57	48	64	100	191	285	164	314	**242**	186
3.	IREK – AESM											1	1	**6**	31	61	73	31
4.	IR – MSU				1			2		3	3	11	3	10	57	229	**241**	86
5.	IRAS - SAUM	2	3	2	3	8	9	50	59	91	72	328	210	170	400	163	**270**	91
6.	IRTUM															12	40	
7.	IR-FIUM						3	3	1	2	4	12	3	9	18	**38**	43	63
8.	DIR-SPU															138	213	750
9.	RSES - NIES													6	4	5	1	1

Table 2: Documents registered in institutional repositories distributed by year of issue

Data in table 2 are presented for the period 2000-2016 (for 1970-1999 there are only 10 documents registered). The year of OAP approval is emphasized by white and bold text (where appropriate) on black background.

From tables 2 it is obvious that the approval of the Open Access policy does not affect the growth of the number of documents registered in that year or later. Some organizations are more active than others in repository exploitation. One repository is not updated (IRTUM).

A deeper analysis of repositories revealed that some repositories have many blank communities (State University of Medicine and Pharmacy, Technical University of Moldova, National Institute for Economic Research). All repositories have at least one blank collection. Sometimes repositories are used for registration of journals and journal issues published by organization-owner of repository (State University of Medicine and Pharmacy, Balti State University, Moldova State University, State Agricultural University of Moldova, Technical University of Moldova, National Institute for Economic Research), while institutional open access repositories of research outputs mean mainly all documents produced by organization researchers.

5. Conclusions

In conclusion to the above, we have discovered that institutions have become aware of the need for open access dissemination of scientific publications in the Republic of Moldova. To achieve this objective a number of institutions are adopting support or compulsory mandate policies for the publications of the institution staff, mainly those funded from public money.

In the Republic of Moldova open access is supported by two complementary models: self-archiving in institutional repositories and publishing in open access journals. For the purpose of implementing, encouraging and promoting the submission of scientific and didactic publications, 8 universities from the Republic of Moldova have approved open access institutional policies and promote open access to documents through institutional repositories.

One distinct feature is that in the Republic of Moldova universities are more active in promotion of open access to research outputs by means of institutional repositories, while research organizations are more conservative and prefer publishing scientific works in open access journals.

Although there are some peculiarities in the provisions related to submission terms of publications in institutional repositories, all stipulated provisions in open access institutional policies do not restrict the freedom of publication or research. All the universities that have approved the open access policies are interested in promoting a new open access paradigm to offer more benefits to science and society, an increased visibility, a greater impact and prestige in the academic scientific community, improvement in the dissemination of research outputs conducted in the universities from the Republic of Moldova.

Academia from the Republic of Moldova recognizes the importance of open access to research outputs but sticks to tradional forms of publishing scientific papers; or prefers to not make them available freely on the Internet.

In order to promote open access policies and their implementation in the Republic of Moldova we consider it necessary:

- nationwide to adhere to international initiatives (the Budapest Declaration and the Berlin Declaration);
- nationally (ideologically) to approve a series of initiatives and declarations in support of open access, for example, at the Academy of Sciences of Moldova, at the Ministry of Education or/and at the Ministry of Culture;
- nationally (politically) to approve legislation, regulations that would authorize open access to scientific research outputs, funded from public money;
- at institutional level to continue the approval of open access institutional policies in research institutions, funding agencies and register these policies in international directories;
- nationally to develop programs and projects to create a national network of electronic open access archives;
- at institutional level to extend the creation of open access institutional repositories which will subsequently be registered in the required international directories.

6. References

[1] ABADAL, E.: Gold or green: the debate on Open Access policies, in: International MicrobIology, 2013, 16, 199-203, available: doi: 10.2436/20.1501.01.194 [accessed 30.12.2016].

[2] An overview of scientific and scholarly journal publishing. Celebrating the 350th anniversary of journal publishing: The STM Report, Fourth Edition. March 2015, available: http://www.stm-assoc.org/2015_02_20_STM_Report_2015.pdf [accessed 30.12.2016].

[3] Codul cu privire la ştiinţă şi inovare al Republicii Moldova [The Code on Science and Innovation of the Republic of Moldova], in: Monitorul Oficial al Republicii Moldova. 2004, 125-129, 1479-1483.

[4] DOAJ, available: https://doaj.org/ [accessed 30.12.2016].

[5] HAUSTEIN, S.: Multidimensional Journal Evaluation: Analyzing Scientific Periodicals beyond the Impact Factor, Berlin, Boston: Walter de Gruyter, 2012.

[6] LAAKSO, M.: Green open access policies of scholarly journal publishers: a study of what, when, and where self-archiving is allowed, in: Scientometrics, 2014, 99(2), 475-494, available: 10.1007/s11192-013-1205-3 [accessed 30.12.2016].

[7] MABE, M.: The growth and number of journal, in: Serials. 2003, 2, 191-197.

[8] MABE, M. and Amin, M.: Growth dynamics of scholarly and scientific journals, in: Scientometrics, 2001, 51(1), 147-162.

[9] MEADOWS, A. J.: Communicating Research, London and San Diego, Academic Press, 1998.

[10] OpenDOAR, available: http://www.opendoar.org/find.php [accessed 30.12.2016].

[11] ROAR, available: http://roar.eprints.org [accessed 30.12.2016].

[12] Strategia de cercetare-dezvoltare a Republicii Moldova până în 2020 [The Research and Development Strategy of the Republic of Moldova until 2020], available: http://lex.justice.md/md/356042/ [accessed 30.12.2016].

[13] Strategia naţională de dezvoltare a societăţii informaţionale „Moldova Digitală 2020" [The National Strategy for the Development of the Information Society „Digital Moldova 2020"], available: http://lex.justice.md/md/350246/ [accessed 30.12.2016].

[14] TENOPIR, C. and KING, D.W.: The growth of journals publishing, in: The Future of the Academic Journal, Second edition, Cope, B., and Phillips A. (Eds.), Chandos Information Professional Series, Elsevier, Chandos Publishing, 2014, 159-178.

[15] WARE, M.: Peer Review: Recent Experience and Future Directions, in: New review of information networking, 2011, 16(1), 23-53.

SECURITIZING THE INTERNET: THE CASE OF TURKEY

Helin Alagöz Gessler[1]

Abstract
The rapid digital development in the last two decades has brought the cyberspace to national security agenda in Turkey as one of the significant challenges of the 21st century. Increasing regulation of the Internet and, in particular, online social networks by the state through digital controls and surveillance is being justified addressing the maelstrom of potential cyber threats. Nonetheless, increasing control of cyberspace contrasts with the commitment to the protection of the individual rights and liberties. This paper maps the Internet freedom in Turkey and asks to what extent Turkey is able to strike a balance between providing the security in cyberspace and protecting the Internet freedom in the country.

In order to analyze how digitization and the Internet have developed into a security issue in Turkey, the paper builds on the theoretical framework of securitization formulated by the Copenhagen School, which deals with the construction of the image of security threats. The paper argues that the perception of networked nature of cyberspace to create dissidence which may result in the destruction of state authority leads to hyper-securitization while neglecting the freedom of expression as well as freedom to access information.

The paper follows the methodology of qualitative case study mainly based on document analysis, assessment of the official internet regulations and media analysis.

1. Introduction

The rapid digital development in the last two decades has brought the cyberspace to national security agendas of many states as a significant challenge of the 21st century. Turkey was one of those states, which took quick action against the potential threats of the Internet, particularly through the legislation and amendments of the Law No. 5651 which regulates the Internet use. However, the law caused a lot of debates in terms of the Internet freedom. In 2016, in line with concerns about Turkey's Internet policy often expressed in national and international media, Freedom House has changed the Internet freedom status of Turkey from "partly free" to "not free".

This paper discusses the Turkish Internet policy and describes the current situation of the Internet in the country from the perspective of security studies. It argues that the perception of networked nature of cyberspace to create dissidence which may result in the destruction of state authority leads to hyper-securitization while neglecting the freedom of expression as well as freedom to access information.

The paper proposes an analytical approach that conceptualizes the Turkish Internet policy as a field of national security, which emerges through a discursive process of securitization. By combining

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the Securitization Theory and the Internet, the paper highlights the performative function of discourses in the field.

Drawing on document analysis, the paper examines the facts stated in the annual Turkey reports of Freedom House about the Internet freedom between 2011 and 2016 in the light of the Securitization Theory.

2. Theoretical Background

2.1 The Copenhagen School and the Securitization Theory

In its simplest form, security refers to the safety of an entity. Over the last decades, security studies have to deal with two main problems. The first problem was the subject matter of security. Which entity should be prioritized to be secured? The state, individual or another unit? The second problem was the nature of threats that face us. From a realist perspective, the states were the referent objects and the military force was the nature of the threat. This view was commonly accepted, in particular, during the Cold War period. [17] Towards the end of the Cold War, due to changing geopolitical conditions, the traditional security approach started to be challenged as various new security threats of multiple referent objects appeared leading to the emergence of new theoretical approaches to security.

Barry Buzan, one of the central figures of the Copenhagen School of Security Studies, was the first who suggested to redefine the existing security concept. In his "People, States and Fear" (1983), he criticized the narrow focus of the traditional security concept and emphasized on the need for the reconceptualization of national security to address non-military threats to the global environment. He pointed out that security of potential referents might rely on the factors operating in military, political, economic, societal or environmental sectors; whereas traditional security approach solely referred to the military sector. [23] In the post-Cold War era, Buzan's view gained more ground when changing security concerns encouraged scholars to seek for alternative security theories.

Although Buzan can be considered as neo-realist concerning his reference to the anarchic structure of the international system [2], his writings contributed to the emergence of critical security theories based on Constructivism. Those criticized Buzan's analysis in 'People, States and Fear' for "privileging state" as the key referent object despite "extending security beyond the state". [17] Constructivists mainly differed from the traditionalist security scholars in seeing a two-way relationship between individuals and the social world. They stressed on the significance of the notion of identity as well as culture, norms and values in the process of specifying threats to national security since those have an impact on state interests.

However, in his subsequent works with his colleagues, Buzan also approached to the constructivist view of security by moving from the state to the society as the referent object and focusing on the concept of national identity and culture in 'Identity, Migration and the New Security Agenda in Europe' (1993) and in 'Security: A New Framework for Analysis' (1998) [24].

One of the main concerns of the Copenhagen School was the "process" of making a state policy, which was the point of departure for Ole Wæver, a colleague of Buzan, who introduced the notion of "Securitization". In this regard, states might resort to securitization to fight against a new threat. In the process of securitization, states need to create a discourse that would legitimize their actions to eliminate the perceived threat. Wæver defined security as the outcome of a "speech act".

Accordingly, Securitization is the discursive process which defines an issue as an existential threat, in other words, a security problem. He highlighted that Securitization only takes place when the elites identify an issue as a security problem and the public accept it [25]. To put another way, securitization was a function of social construction that requires legitimization of the issue concerned as a security issue. Thus, one might assume that an issue, which was formerly in the domain of low politics can be transferred to high politics through the process of securitization.

2.2 Extending the Realm of Securitization to Cybersecurity

The security of the Internet and the cyberspace were not counted by the Copenhagen School among the sectors, where securitization might take place. For Buzan, Wæver and de Wilde, Pentagon's reference to hackers in 1996 as "a catastrophic threat" and "a serious threat to national security" was not sufficient to talk about a cybersecuritization since it had "no cascading effects on other issues" [4]. Nevertheless, by the time the Copenhagen School made this assumption, the concept of cyber security was not voiced as frequently as today and it was not yet included in the national security agendas of many countries. The formation and evolution of cyber security discourse in response to growing significance of the role of the Internet in our daily lives brought about the need for understanding cyber security as a discursive modality.

The first attempt to add cyber security sector to the existing framework of securitization theory was made by Hansen and Nissenbaum in *Digital Disaster, Cyber Security, and the Copenhagen School*, where they employed the Securitization Theory to examine the distributed denial of service attacks (DDoS) on a series of government agencies, the news media and the two largest banks in Estonia in 2007. They theorized the cyber security "as a distinct sector with a particular constellation of threats and referent objects" [14].

Hansen and Nissenbaum argued that the political importance of ''network security'' and ''individual security'' stems from connections to the collective referent objects of ''the state,'' ''society,'' ''the nation,'' and ''the economy.'' These referent objects are articulated as threatened through *hypersecuritization*, everyday security practices, and *technifications*, which are three distinct forms of securitizations. They also stressed that the Estonian government achieved at least a partially successful *cybersecuritization* since it created a discourse which aimed to show those attacks especially to the international audience as ''the first war in cyberspace'' by coupling of ''network'' to ''state'' and ''society'' and highlighting that they were threatening the individual security [14].

In this context, two distinct cybersecurity perspectives may affect the process of *cybersecuritization* depending on the perception of "what needs to be secured". From the perspective of mainstream privacy research the online freedom of the individual citizens constitutes the focal point; whereas from the perspective of the state the protection of critical infrastructure is much more significant as it provides citizens with the services which enable them access the Internet.

3. Securitization of the Internet in Turkey

3.1 Reading the Reports of Freedom House on Turkey's Internet Freedom

The facts about Turkey's cyber circumstances are summarized in the Internet freedom reports of the Freedom House, which is an independent watchdog organization based in the United States.

Covering the key developments in Turkey those annual reports provide us with adequate source of data to study the securitization rhetoric on Turkish case.
The reports evaluate the level of Internet freedom in a country by looking at the scores of that country in three main fields which are divided into subcategories shown in Figure 3.1. Accordingly, 0 point equals to "most free" and 100 points equal to "least free".

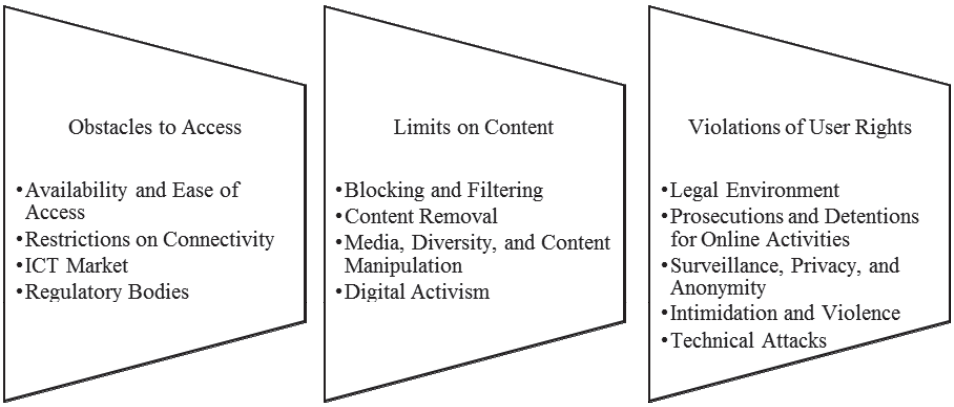

Figure 3.1: The Fields of Internet Freedom

Table 3.1 shows that Turkey has been following a negative trend in all of those categories over the past five years. The situation regarding the Internet freedom even exacerbated in 2016.

	2011	2012	2013	2014	2015	2016
Obstacles to Access (0-25)	12	12	12	14	13	13
Limits on Content (0-35)	16	17	18	18	20	21
Violations of User Rights (0-40)	17	17	19	23	25	27
Total (0-100) 0=most free, 100=least free	45	46	49	55	58	61
Internet Freedom Status	Partly free	Partly free	Partly free	Partly free	Partly free	Not free

Table 3.1: Internet Freedom Status in Turkey, 2011-2016
Sources: [8] [9] [10] [11] [12] [13]

As seen in Table 3.2, the reports between 2011 and 2016 confirmed the steady growth of the Internet penetration in Turkey, which is directly proportional to the population growth. The increasing Internet penetration was mainly through mobile broadband. From 2009 till 2016 all Turkish mobile phone operators offered 3G (third-generation) data connections. Three companies have begun to offer 4.5G[2] services as of April 2016.

[2] It was initially planned for 4G technology, however after President Erdogan's insistence on moving directly to 5G, it was changed to 4.5G.

	2011	2012	2013	2014	2015	2016
Population	73,6 million	75 million	74,9 million	76,1 million	77,2 million	78,7 million
Internet Penetration	36 %	42 %	45 %	46 %	51 %	54 %

Table 3.2: Population vs. Internet Penetration in Turkey, 2011-2016
Sources: [8] [9] [10] [11] [12] [13]

That being said, there is still the problem of digital divide in the country. Many users connected the Internet at their workplace, universities etc. since they had no Internet access at home (In 2016 % 61 of the Turkish population were Internet users and % 76 of the Turkish households had Internet access [22]). The factors such as high prices (in comparison with the minimum wage) and lack of technical literacy are counted among the main causes of the digital divide between the poor and rich or senior and young people. The 2016 Report underlines the telecommunications networks shutdowns during security operations, particularly in southeastern cities as the most significant obstacle to the Internet access increasing the digital divide between the region and the rest of the country [13].

The reports make serious criticisms of the limits on content. There is an immense increase (from 43,785 to 111,011) in the number of blocked websites due to civil code–related complaints and intellectual-property rights violations in the last three years [13]. They argue that most of those sites were blocked for political or social reasons including "news outlets or online communities that report on LGBTI (lesbian, gay, bisexual, transgender, and intersex) issues, ethnic minorities, specifically pro-Kurdish content, anti-Muslim content, or social unrest". All reports underscore an increasing government censorship of the Internet and social media blocking. Social media platforms such as Twitter, Facebook, and YouTube were several times blocked due to certain posts or accounts typically after terrorist attacks.[3] The reports point out that the blocking orders tend to coincide with important political events, such as an election, intelligence leak, hostage crisis, or corruption scandal, military operations, terrorist attacks [11]. The 2016 Report states:

> Prompted by a series of deadly terrorist attacks, the government repeatedly blocked or throttled social media platforms in a bid to halt the dissemination of images and videos surrounding the events. In addition, scores of news sites and Twitter accounts were blocked or removed, particularly those covering the conflict with Kurdish militants. Journalists, scholars, and public figures that are critical of the government faced coordinated harassment by progovernment trolls on Twitter [13].

The main legal reference for the blocking and removal of online content in Turkey is the Law No. 5651 (entitled "Regulation of Publications on the Internet and Suppression of Crimes Committed by Means of Such Publication") or so-called "Internet Law" enacted in 2007. It initially aimed at the protection of children from illegal and harmful Internet content such as material related to sexual abuse, drug use, provision of dangerous substances, prostitution, obscenity, gambling, suicide promotion, and prevention of crimes against Atatürk [19]. The law was applied through the Telecommunication and Communication Presidency (TİB), which was overseen by the main regulatory body for the ICTs in Turkey entitled the "Information and Communications Authority (BTK)". The TİB was shut down in August 2016 due to allegations of being masterminded by the Fetullahist Terrorist Organization (FETÖ) passing its authority to the BTK [16]. The BTK is currently the only responsible institution for the regulation of the policies made by the Ministry of

[3] The Freedom on the Net 2016 Report states: "Turkey accounted for almost 90 percent of all content that was locally restricted by Twitter in the second half of 2015. Turkey's regulator fined the company TRY 150,000 (US$ 51,000) for refusing to remove what it termed "terrorist propaganda".

Transportation, Maritime Affairs, and Communications. Having board members appointed by the government the BTK is criticized for a lack of transparency and a lack of independence from the executive [13].

Nonetheless, the Law No. 5651 has gone through amendments in February 2014 and March 2015 broadening the scope for censorship [26]. The law also outlined the responsibilities of content providers, hosting companies, public access providers, and ISPs reserving the right to take down domestically hosted websites and block or filter the websites based abroad through ISPs in case of proscribed content. The February 2014 amendments extended it from notice-based liability to include URL-based blocking orders to be issued by a criminal court judge and assigned the TİB with "broad discretion to block content that an individual or other legal claimant perceives as a violation of privacy, while failing to establish strong checks and balances". The March 2015 amendments made it possible for cabinet ministers to ask the TİB to block content when they consider that the content violates "the right to life, secure property, ensure national security and public order, prevent crime, or protect public health." In this case, the TİB has to follow the orders within four hours and inform the criminal court about it within 24 hours. The blocking must be rescinded unless a judge validates the decision within 48 hours [15].

Another field examined by the reports is the "Violations of User Rights". In this field, there is a particular emphasis on arrests and prosecutions for social media posts, which, in some cases, ended up with lengthy prison sentences for "insulting" public officials or spreading "terrorism propaganda". The reports highlight the government surveillance, the bulk retention of user data, and limitations on encryption and anonymity as key issues. In this context, the Law No, 5651 is criticized again since it binds the hosting and access providers to retain all traffic information for one year and maintain the accuracy, integrity and confidentiality of the data. A similarly controversial issue is the Law No. 6532 on Turkey's National Intelligence Organization (MIT), which grants intelligence agents "unfettered access to communications data without a court order". It is criticized for limiting the accountability of wrongdoing [13].

In the meantime, the reports stress on a lack of sufficient cybersecurity measures, put it differently, a security gap with the example of a 14-day cyberattack in December 2015 bringing approximately 400,000 websites offline and temporarily suspending retail banking services and upload of personal data such as identity numbers and addresses of almost 50 million Turkish citizens onto a website titled the "Turkish Citizenship Database" in a massive data leak in March 2016 [13].

3.2 Back to Securitization Discussion

As discussed in the first part of the paper, there are three crucial elements of a securitization process portrayed by the Copenhagen School. First, there must be an existential (even when it is not in reality) threat identified by a referent object. Second, the referent object must establish the need for action in order to eliminate the threat. Third, the rules governing the relationship between the referent object and the threat under normal conditions must be rejected [17]. Taking Turkish government as the referent object, the Internet as the sector of identified threat and the manner the government deals with the threat, the picture presented by the Internet Freedom reports puts forward the presence of a *cybersecuritization* in Turkey over the past years.

In parallel to the increase in the Internet penetration, there is a considerable increase in the telecommunications networks shutdowns, blockings and removal of political content of the social media as well as the number of arrested ICT users and other limits on online communication

activity. The government legitimizes its heavily criticized Internet policy with a discourse, which justifies the restrictions to online freedom of expression with the protection of national security. Moreover, increasing terror attacks following the 2015 general elections and the social polarization facilitate the *cybersecuritization* by creating a public perception of online threats to the national security and the need for resolving those threats.

Today, it is possible to argue that there is a securitization of the Internet overall in the world since our daily "real world" crimes moved online, making Turkey not an exception to this. Admitting the growing importance of cybersecurity due to cyber crimes which brings about a global tendency towards *cybersecuritization*, it can be argued that Turkey stands out with its strict Internet policy as an example of *hypersecuritization*. The term was introduced by Buzan to describe a situation of over-securitization by defining "a tendency both to exaggerate threats and to resort to excessive countermeasures". Buzan suggests to check the existence of "real threats" that are not exaggerated in order to identify the "exaggerated threats" [3]. Hansen and Nissenbaum distinguish *hypersecuritizations* from securitization by the former's instantaneity and interlocking effects [14].

As Freedom House reported in detail, blocking orders as well as arrestments tend to coincide with important political events in Turkey such as an election, intelligence leak, hostage crisis, corruption scandal or terror attacks and military operations. This brings Turkey's *cybersecuritization* into question as it enables the state not only to fight against cyber crimes but also to suppress the dissident individuals or social groups by cutting off their communication. Although the freedom of expression is explicitly protected by the Article 26 of the Turkish constitution[4] and no law "specifically criminalizes online activities like posting one's opinions, downloading information, sending email, or transmitting text messages, many provisions of the criminal code" such as the Article 125 and 255[5] and "other laws, such as the Anti-Terrorism Law, are applied to both online and offline activity" [13]. The broad terrorism definition of the Anti-Terror Law has been widely criticized for being abused by courts to prosecute critical journalists and academics.[6] In this context, Turkeys securitization of the Internet meets the criteria for a *hypersecuritization*.

4. Conclusion

Throughout this paper the Securitization Theory, its implications for cyberspace and the Turkish case of *cybersecuritization* were examined. An overview of the Internet freedom status of Turkey was given and it is described as an example of *hypersecuritization* of the cyberspace.

It is essential that the state takes measures for the sustainability of a secure cyber environment so that daily online practices can function seamlessly. However, the question of where and when the state should intervene the online user rights remains controversial, particularly in times of political instability.

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[4] The Article 26 of the Turkish constitution states that "everyone has the right to express and disseminate his thought and opinion by speech, in writing or in pictures or through other media, individually or collectively." See Constitution of the Republic of Turkey, p. 12 [6].

[5] The Article 125 of the Turkish criminal code, "anyone who undermines the honor, dignity or respectability of another person or who attacks a person's honor by attributing to them a concrete act or a fact, or by means of an insult shall be sentenced to imprisonment for a term of three months to two years, or punished with a judicial fine." According to the Article 299 of the Turkish criminal code "Defaming a public official carries a minimum one year sentence, while insults to the president entails a sentence of one to four years" [21].

6 Article 7 of the Anti-Terror Law states that "those who make propaganda of a terrorist organization by legitimizing, glorifying or inciting violent methods or threats are liable to prison terms of one to five years…" [20].

In this regard, the developments in the last five years concerning the obstacles to access, limits on content and violations of user rights indicate that Turkey's *hypersecuritization* of the cyberspace imperils the Internet freedom. One should therefore consider whether a process of *desecuritization*, in other words, "the move out of a logic of security and into a political or a technical one" [14] can help improve the e-democracy in the country.

A new Data Protection Law enacted on 7 April 2016, which aligns Turkey's legislation with EU standards is encouraging since it can be used as an initiative for the *desecuritization* of the Internet in Turkey. In the upcoming years, it will be possible to analyze its impact on the Internet freedom of the country.

5. References

[1] BUZAN, B.: People, States and Fear: An Agenda for International Security Studies in the Post-Cold War Era, 2nd Edition, London: Harvester Wheatsheaf, 1983.

[2] BUZAN, B.: People, States and Fear: An Agenda for International Security Studies in the Post-Cold War Era, London: Harvester Wheatsheaf, 1991, p. 21.

[3] BUZAN, B.: The United States and the Great Powers: World Politics in the Twenty-First Century, Cambridge: Polity, 2004, p. 172.

[4] BUZAN, B., WÆVER, O. and DE WILDE, J.: Security. A New Framework for Analysis, Colorado: Lynne Rienner Publishers, 1998.

[5] COLEMAN, S. and BLUMLER, J. G.: The Internet and Democratic Citizenship, New York: Cambridge University Press, 2009.

[6] Constitution of the Republic of Turkey, available at https://global.tbmm.gov.tr/docs/constitution_en.pdf, [accessed 18 January 2017].

[7] DEGIRMENCI, N.: Turkey's First Comprehensive Data Protection Law Comes into Force, Inside Privacy, 8 April 2016, available at https://www.insideprivacy.com/data-security/turkeys-first-comprehensive-data-protection-law-comes-into-force/, [accessed 21 January 2017].

[8] Freedom House, Freedom on the Net 2011, available at https://freedomhouse.org/report/freedom-net/2011/turkey, [accessed 16 November 2016].

[9] Freedom House, Freedom on the Net 2012, available at https://freedomhouse.org/report/freedom-net/2012/turkey, [accessed 16 November 2016].

[10] Freedom House, Freedom on the Net 2013, available at https://freedomhouse.org/report/freedom-net/2013/turkey, [accessed 16 November 2016].

[11] Freedom House, Freedom on the Net 2014, available at https://freedomhouse.org/report/freedom-net/2014/turkey, [accessed 16 November 2016].

[12] Freedom House, Freedom on the Net 2015, available at https://freedomhouse.org/report/freedom-net/2015/turkey, [accessed 16 November 2016].

[13] Freedom House, Freedom on the Net 2016, available at https://freedomhouse.org/report/freedom-net/2016/turkey, [accessed 16 November 2016].

[14] HANSEN, L. and NISSENBAUM, H.: Digital Disaster, Cyber Security, and the Copenhagen School, International Studies Quarterly, No. 53, 2009, p. 1155-1175.

[15] Hurriyet Daily News, Approved article gives Turkish gov't power to shut down websites in four hours, 20 March 2015, available at http://bit.ly/1C3iuA8, [accessed 14 January 2017].

[16] Hurriyet Daily News, Turkey shuts down telecommunication body amid post-coup attempt measures, 17 August 2016, available at http://www.hurriyetdailynews.com/turkey-shuts-down-telecommunication-body-amid-post-coup-attempt-measures.aspx?pageID=238&nID=102936&NewsCatID=338, [accessed 14 January 2017].

[17] MALIK, S.: Framing a Discipline in HOUGH, P.; MALİK, S.; MORAN, A. and PİLBEAM, B. (Eds), International Security Studies. Theory and Practice, Cornwall: Routledge, 2015, p. 4.

[18] MATHEWS, J.: Redefining Security, Foreign Affairs, Vol. 68, No. 2, Spring 1989, pp. 162-177.

[19] Resmi Gazete (Official Gazette), Internet Ortamında Yapılan Yayınların Düzenlenmesi ve Bu Yayınlar Yoluyla İşlenen Suçlarla Mücadele Edilmesi Hakkında Kanun (Regulating Broadcasting in the Internet and Fighting Against Crimes Committed through Internet Broadcasting), No. 26530, 23 May 2007, available at, http://www.resmigazete.gov.tr/eskiler/2007/05/20070523-1.htm, [accessed 2 November 2016].

[20] Terörle Mücadele Kanunu (Anti-Terror Law), available at http://www.mevzuat.gov.tr/MevzuatMetin/1.5.3713.pdf, [accessed 12 January 2017].

[21] Türk Ceza Kanunu (Turkish Criminal Code), available at http://www.mevzuat.gov.tr/MevzuatMetin/1.5.5237.pdf, [accessed 12 January 2017].

[22] Türkiye İstatistik Kurumu (Turkish Statistical Institute), "Household Usage of Information Technologies Survey of Turkish Statistical Institute, 2016," 18 August 2016, available at http://www.tuik.gov.tr/PreHaberBultenleri.do?id=21779, [accessed 2 February 2017].

[23] ULLMAN, R., Redefining Security, International Security, Vol. 8, No. 1, Summer 1983, pp. 129-153.

[24] WÆVER, O., BUZAN, B., KELSTRUP, M. and LEMAITRE, P. et al.: Identity, Migration and the New Security Agenda in Europe, London: Pinter Publishers Ltd., 1993.

[25] WÆVER, O.: Securitization and Desecuritization in Lipschutz, R. (ed.), On Security, New York: Columbia University Press, 1998, p. 24.

[26] World Intellectual Property Organization, Law No.5651 on Regulating Broadcasting in the Internet and Fighting Against Crimes Committed through Internet Broadcasting,, available at, http://www.wipo.int/wipolex/en/details.jsp?id=11035, [accessed 11 November 2016].

Transparency II

THE LIMITS OF TRANSPARENCY IN ADMINISTRATIVE PROCEEDINGS – THE HUNGARIAN APPROACH[1]

Gergely László Szőke[2]

Abstract
For both the functioning of the state and in a broader sense, that of society it is a key question to determine who has access to the public data, for what purposes, to what extent and on what conditions. The questions of disposal of, access to and public disclosure related to the data processed by the state concern several fields of law, and the coherency of the legal provisions is far not obvious. The aim of this study is to discuss a few aspects of this comprehensive issue. Since some of the public data are processed in public administration proceedings, the question of how public disclosure is enforced in the specific administrative proceedings, and more specifically, how compliant the Hungarian regulation of the freedom of information is with the right of inspection regarding concrete cases is examined. Although the research is focusing mainly on the Hungarian legislation, the findings of this essay may be also used in the international discourse.

1. Introduction

Ever since their formation, states have been the largest data controllers,[3] as the functioning of the state very often appears in practice as an operation performed on the various data, documents or records [2]. It is a key question for both the functioning of the state and in a broader sense, that of society to determine who has access to these, for what purposes, to what extent and on what conditions. There is, however, an important preliminary question too, which is the „level of system" in these data, which can be understood in a concrete, physical sense, i.e. whether the state is aware at all of what data assets it possesses, which public body manages these data, where and how, and how access to and orientation in these (e.g. searching) are ensured in a technical sense. On the other hand, the key question is the „level of system" in these data in a regulatory sense, i.e. whether the legal classification of the many kinds of data that are processed by the state, the rules that refer to the individual groups of data (e.g. records) are clarified, furthermore, whether the rules of access to these data are well-regulated – and this latter is the key question for the purposes of this paper.

The questions of disposal of, access to and public disclosure related to the data processed by the state concern several fields of law, primarily of course the regulation of data protection and the freedom of information, the various confidentiality rules (especially the regulation of classified data, the rules governing business secrets, as well as the further types of secrets). And the absolutely new field of law, the regulation of the re-use of public sector information (PSI) also should me mentioned, although the role and position of the re-use of PSI is the current scheme of freedom of

[1] The paper is based on the results of the OTKA (the Hungarian Scientific Research Fund) research called 'Regulatory Issues of Internet Intermediaries' (No. 116551). The present scientific contribution is also dedicated to the 650th anniversary of the foundation of the University of Pécs, Hungary.
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[3] It is true that the large online providers are meaningful competitors with regard to personal data these days, as Google, Facebook and other similar pages know at least as much about a user as the state itself.

information is far not obvious [3]. Finally, the public disclosure of the specific public administration procedures, on the other hand, is usually regulated in procedural laws.

These are also hot topics in legal discourse but the research efforts are primarily focused on specific areas. Such research is usually very thorough in these partial areas but there is a scarce number of comprehensive studies in Hungary on the „legal regulation of data" in general and especially, on the legal regulation of what are called public data.[4] A high number of dogmatic issues are unclarified and at many points, it would be justified to analyze some legal institutions, which seem to be different, in relation to each other as well.

The aim of this study is to discuss a few aspects in a declaredly narrow area. Since some of the data of public interest are processed in public administration proceedings, the question of how public disclosure is enforced in the specific administrative proceedings, and more specifically, how compliant the Hungarian regulation of the freedom of information is with the right of inspection regarding concrete cases as stipulated in the Act on the General Rules of Administrative Proceedings and Services (Ket.),[5] is examined[6] with an outlook to the new law on public administration procedure, entering into force in 2018.[7] Although the research is focusing on the Hungarian legislation, the findings of this essay may be also used in the international discourse.[8]

2. The transparency of the functioning of the state

Transparency is one of the basic values in the modern democratic societies. Transparency nowadays is put in a broader context: the Open Government approach both emphasise the importance of the transparent operation of the state and the involvement of citizens into public policy decisions. An important element of Open Government initiatives is ensuring access to open, complete and reusable public data. It has to be seen, that Open Data provided by the governments cannot only serve the possibility to control the government by the society but may also foster of creating new (economic and social) values by reusing them in several ways [7].

While referring to the big picture, this essay mainly concentrates on transparency issues. The transparency of state functioning is traditionally meant to be ensured by the freedom of information. Freedom of information is essential for public participation: information about the activities of the government is essential to participate in the democratic process [4]. The question of the freedom of information is sometimes defined as a part or prerequisite of the freedom of expression in international human rights documents.[9] The Hungarian regulation is different from this and both the protection of personal data and the freedom of information are regulated as fundamental „information rights", with regard to each other, both on the level of the Fundamental Law and on

[4] In this respect, the most comprehensive work is without doubt László MAJTÉNYI'S work, C.f. [8]
[5] Act CXL of 2004 on the General Rules of Administrative Proceedings and Services (Ket.)
[6] This problem was first discussed by me as part of a comprehensive study, in which the relationship between public administration and the media was first brought up in issue 4 of 2015 of the journal Pro Publico Bono (András Bencsik – Adrián Fábián – Emese Pál – Gergely László Szőke: A közigazgatás és média kapcsolódási pontjai. This issue is also analyzed by the Commentary on the Public Administration Act [5]
[7] Act. CL of 2016 on the General Public Administration Procedure (Ákr.)
[8] E.g. a Hungarian Case of the ECHR, the case of TASZ vs. Hungary (Judgment by the European Court of Human Rights (Second Section), case of Társaság a Szabadságjogokért v. Hungary, Application no. 37374/05 of 14 April 2009) also concerns this issue, and became an important milestone in the international interpretation of Freedom of Information.
[9] Article 10 of the European Convention on Human Rights is a good example for this.

that of the specific laws. On the level of statutory regulation, this solution appeared as early as in 1992, which at that time qualified as a pioneer solution in Europe [6].

According to Section (2), Article VI of the Fundamental Law of Hungary, „Everyone shall have the right to the protection of his or her personal data, as well as to have access to and disseminate information of public interest." The details of the regulation are found in Act CXII of 2011 on the Right of Informational Self-Determination and on Freedom of Information (hereinafter referred to as: Infotv.).

The concept of 'information of public interest' is defined by the law rather broadly, i. e. „'public information' shall mean any known fact, data and information, other than personal data, that are processed and/or used by any person or body attending to statutory State or municipal government functions or performing other public duties provided for by the relevant legislation (including those data pertaining to the activities of the given person or body), irrespective of the method or format in which it is recorded, and whether autonomous or part of a compilation".[10] The freedom of information generates a right for the individual, while it imposes an active obligation to ensure the public disclosure of this information for the state. The latter obligation can basically be met in two ways: either by proactively disclosing some data at the start, or by giving access to the applicant if public information is applied for.

Unfortunately, the recent period has clearly seen a tendency of narrowing access to public information via legislation. As examples, we can mention the obligation to provide the name of the data applicant (which, however, does not mean actual identification), which can hardly be justified on a constitutional basis, the emergence of ex-lege secrets (i.e. the legislator qualifies certain data as secrets, via a law, omitting the usual qualification procedure), furthermore, the rules regarding „account level" control, the significant broadening of cost refunds, as well as the changes related to the so called „data underlying the decisions" – the latter of which we will discuss in detail.

However, the regulation and practice of the freedom of information in Hungary can be described as a legal institution that basically works properly. In this, besides jurisprudence and law enforcement, some players of the media (especially investigative journalists) and quite a number of NGO's focused on this area as data applicants that generate cases also play an important role.

3. The limits of the transparency of administrative proceedings

The most exciting issue for the purposes of this study is where the limits of the transparency of public information lie, especially in the individual public administration proceedings, and how coherent the regulation of this area is.

3.1 The constraints of public disclosure in the Freedom of Information Law

Starting out from Infotv., we can see several constraints: the protection of personal data, the confidentiality of classified data, the protection of business secrets, and the confidentiality of the special category of data called „data underlying the decisions". Finally, although it is not directly mentioned in Infotv., certain sectoral and official secrets may also act as further obstacles to transparency.

[10]Point 5, Section 3 of Infotv.

It should be noted that a deed or document may contain a mix of accessible and inaccessible data, and it is not easy to distinguish between these two types of data. According to the provisions set out in Infotv., the data applicant may receive copies of the document or the section of document that contains the data but if the document also contains inaccessible data, this should be made unrecognizable in the copy.[11] The latter is an operation whose labour cost can be charged to the data applicant as a cost refund, in harmony with the hourly rate of the staff member who actually performs this job.[12]

3.1.1 Personal data

By having defined the concept of data of public interest, the legislator made it clear that the accessibility of personal data does not belong to this scope, thus the protection of these enjoys priority, as a general rule. Based on this, those records of public administration which contain personal data do not qualify as data of public interest, neither do those data belong to the latter category which can be related to natural persons in any and all individual cases (administrative proceedings).[13]

3.1.2 Classified data

It is also clear and there is also an express reference to it in Infotv.[14] that access to classified information shall be limited to a predefined scope of persons, which is regulated in detail by a special law.[15]

3.1.3 Business secrets

The protection of business secrets also takes priority over the public disclosure of data of public interest, with the exception of a very important and wide group of cases: the data on the utilization of public funds and the use of public property do not qualify as business secrets, i.e. these data shall be transparent.[16]

3.1.4 Further constraints and secrets

Infotv. itself sets out provisions on that the access to the data of public interest may be restricted by law, for national defence or national security interests, for the prosecution or prevention of crimes, for environmental protection or nature conservation, central financial or foreign exchange policy interests, with regard to external relations, relations with international organizations, court or administrative proceedings, as well as the right to intellectual property.[17]

In the legal system, there are several different types of sectoral, professional and occupational secrets such as bank secrets, insurance secrets, tax secrets, as well as medical secrets, lawyer's

[11] Sections 29(3) and 30(1) of Infotv.
[12] Cf. Point (c) of Section 29(5) of Infotv. with Section 3(2) of government decree No. 301/2016 (IX. 30.) on the extent of the cost refund chargeable for disclosing data of public interest
[13] There are, however, several exceptions to this rule as well, the accessibility of certain personal data or records that contain such may be required by law.
[14] Section 27(1) of Infotv.
[15] Act CLV of 2009 on the Protection of Classified Information (Matv.)
[16] Section 27(3) of Infotv.
[17] Section 27(2) of Infotv.

secrets, notary public's secrets, ecclesiastical secrets. These are basically regarded by the legal literature as factors constraining the transparency of data of public interest [8].

3.1.5 Data underlying the decisions

However, a part of public administration proceedings does not, or hardly at all affects personal data and/or business secrets, there are even less classified data, so the related regulation in itself does not at all mean that people are not allowed to have access to the details of some cases of public interest (even those in progress) based on the right to the freedom of information. However, in some cases, public disclosure undoubtedly needs to be restricted even beyond this point.

In the interpretation of the right to access to data of public interest, the idea that the confidentiality of certain draft or preparatory documents must be ensured emerged at a rather early stage. In an order adopted by the Constitutional Court as early as 1994, it is stated that „it is a guaranteed institution of the standards and efficiency of the civil servant's activities that the decision-making of civil servants should be free, informal and free from pressure from the public. This is why the public disclosure of documents refers only to the final versions of the documents and not to the interim, draft materials."[18] The provisions excluding the public disclosure of data prepared for internal use, related to decision-making (e.g. draft materials, memoranda, blueprints, outlines, proposals, correspondence within the organization)[19] were also published as a specific rule in the law in 1995, which step has since been followed by many amendments and clarifications.

Any data which are developed or recorded in the proceedings that are aimed at decision-making and that underlie the decision in the competence of the body that performs the public task in accordance with the effective regulation are not public for as many as ten years from the date of their generation. However, the head of the public body may allow access to these data, after having considered the weight of public interests in giving or excluding such access.[20]

As long as the decision has already been made, confidentiality can only be maintained in exceptional cases. The effective regulation partially meets this requirement when it stipulates that „a request for disclosure of information underlying a decision may be rejected after the decision is adopted if the information is retained to support a future decision as well, or if disclosure is likely to jeopardize the legal functioning of the body with public service functions or the discharging of its duties without any undue influence, such as in particular the freedom to express its position during the preliminary stages of the decision-making process on account of which the information was required in the first place."[21]

Making sure that „the information to support a future decision as well" is confidential was included in the law with effect from October 1, 2015, and it may actually involve a significant limitation of the freedom of information – it is especially cynical that the legislator concealed this among the provisions that narrow this confidentiality anyway. In theory, any kind of data may underlie a decision that is to be made later as well, a broader interpretation of this section would lead to the emptying out of the entire right to the freedom of information. The constitutionality of the rule is highly questionable [1] and it clearly goes contrary to the previous practice followed by the

[18] Constitutional Court order No. 34/1994 (VI. 24.), translation of the original Hungarian text.
[19] Constitutional Court order No. 12/2004 (IV. 7.)
[20] Section 27(5) of Infotv.
[21] Section 27(6) of Infotv.

Constitutional Court, in which it was mentioned several times that a data request can only be rejected by reference to a specific decision-making process.[22]

The regulation of the data underlying the decision means an automatic restriction of public disclosure on the one hand, in lack of which „an individual decision on the confidentiality of each item of data related to decision-making should be made, in order to ensure the protection of draft materials and the efficiency of the decision-making procedure or the functioning of the body in question", and which „would mean an intolerable administrative burden" for the affected bodies.[23] On the other hand, however, the lack of a formal, preliminary classification requirement does not mean that the body concerned should not thoroughly consider the issue. „If the data controller body decides to reject the disclosure of the data of public interest, this […] should be properly justified in order to ensure that the constitutional requirements are met", which „should on the one hand extend to what specific decision to be made in a procedure in progress should be substantiated by the data of public interest to be disclosed, and on the other hand, to what extent the disclosure of the data of public interest affects the adoption of the decision in question".[24]

3.2 The rules regarding the inspection of documents as set out in Ket. and in Ákr.

As a starting point, it can be established that the basic principles of Ket. and the Ákr. include neither publicity in general nor the principle of a public hearing[25] but there is no reference on the level of fundamental principles to the contrary of these, i.e. to the confidentiality of procedural activities and official deeds either.[26]

3.2.1 Rules of confidentiality

In relation to the transparency of the documents generated during the procedure and the access to the data included therein, it is Ket.'s Section 17(1) on the protection of privileged data, as well as Section 68 governing the inspection of documents that provide guidance. This means that during the public administration procedure, and under Section 69(6) of Ket., also after the binding closure of the proceedings, access to the documents will primarily be available, besides the clients and the witnesses to third parties: „third person may be allowed access to documents containing any personal data or privileged information,[27] if able to substantiate that the inspection of the document is necessary for the enforcement of his right, or for the fulfilment of his obligation conferred upon him by the relevant legislation or an official ruling, and if the legal requirements for access to privileged information are satisfied."[28] The restriction is not limited to privileged information by chance, as the Commentary on the law says that „the wording of the law is justified by that [if] the documents contain data of public interest or data disclosed for public interests, then any person will be entitled to inspect these documents according to the rules set out in Act CXII of 2011 on the Right of Informational Self-Determination and on Freedom of Information." However, the Commentary on Ket. also narrows down the interpretation of this section without justification when it says that „in this law, documents that contain personal data (as well as privileged data) are

[22] See e.g. the justification of Constitutional Court order No. 21/2013 (VII. 19.)
[23] Constitutional Court order No. 12/2004 (IV. 7.), translation of the original Hungarian text.
[24] Constitutional Court order No. 21/2013 (VII. 19.), translation of the original Hungarian text.
[25] In this paper, the right to a public hearing is not discussed.
[26] Sections 1-8 of Ket., Sections 1-6. of Ákr.
[27] According to Section 17(1) privileged information is „statutory secrets" and „secrets obtained in the course of professional activities".
[28] Section 68(3) of Ket.

mentioned but according to the general rule, all official documents are inevitably tied to the clients of the case, so these can be regarded as personal data" [5].[29] The problem itself is of a broader scope, as legal entities, economic associations or any other bodies that discharge public duties can be clients as well, in the case of which the personal data are not protected, i.e. in this case only the rules that refer to the privileged data pose restrictions.

According to the provisions set out in Ket., classified data, as well as business, bank, insurance, securities, cash desk secrets, salary secrets, tax secrets, customs secrets, as well as private secrets qualify as statutory secrets, while secrets tied to practicing certain occupations include, especially medical, lawyer's and notary public's secrets, furthermore, the secrets tied to practicing occupations by an ecclesiastical person and the member of an organization pursuing religious activities who performs religious rituals as a profession.[30] It should be noted that the first one is an itemized list, while the second one quotes examples, i.e. the legal system may contain further rules on secrets that also qualify as privileged data for the purposes of Ket. as well.

The Ákr. contains simplified, but very similar rules. Although the Ákr. does not use the category of "secrets tied to practicing certain occupations", and does not define "statutory secrets", the actual content and interpretation of the provisions regarding the protection of privileged data and access to the documents [Sections 27(2) and 33(3)] are practically the same as in the Ket.

Thus, based on the above sections, the right of inspection of documents is not restricted for third persons (which potentially means anyone) besides personal and privileged data, which, as it turns out from the justification, allows access to the very data of public interest.

Pursuant to Section 17 of Ket., in the case of personal and privileged data,[31] it is the authority that has to make sure that they are not disclosed to the public and not made familiar to any unauthorized persons. It is also the authority that has to ensure that accessible and inaccessible data are distinguished between, for which, however, a refund of HUF 200 per page can be charged, which is an amount defined in a government decree.[32]

3.2.2 Data underlying decisions

In Ket., the confidentiality or transparency of the data underlying the decisions is not discussed in relation to the right of inspection of documents. However, in Point a), Section 69(1), it is specified in detail that draft decisions are not accessible to the public. Section 34(1) of the Ákr. contains the very same restriction. These are absolute prohibitions from which no exemptions can be given by the public body concerned either.

The Commentary on Ket., fundamentally building on the foundations of public administration activities, on the one hand concludes that, since a draft decision or another document that is regarded as one that prepares the final decision (e.g. the relevant memorandum of the executive) are formally not part of the official procedure, they are not given any serial numbers either, the client is most probably not even aware of the existence of such a document, the right of inspection does not

[29] Cf. [5], p. 527., translation of the original Hungarian text.
[30] Section 172 of Ket., points g), l)
[31] It may come up as yet another exciting research issue what exactly the term „secret protected by law and secret depending on practicing a profession" (jointly: privileged data) of a slightly uncertain content means and whether this rule, which basically limits the transparency of the data of public interest, would stand the test of constitutionality.
[32] Sections 68(3) and 69 (3) of Ket.

refer to these documents [5]. On the other hand, the conclusion is that „official documents do not qualify as ones that underlie the decision according to the data protection [and freedom of information] regulation and in the sense of public administration activities, these are real activities rather than actual activities without legal effect" [5].[33] In relation to the latter, it should be noted that in the data protection regulation, it is actually not „decision-making documents" but „data underlying the decision" that are discussed, which may, in my view, include all such data of a specific official case which may meaningfully influence the final decision.[34] It is definitely obvious that the interpretation issues of the data underlying the decisions are by far not uniform and it can also be established that the interpretation used by the acting public administration body has a rather wide space for manoeuvre in judging this, both as consequence of the system of Infotv. and that of Ket. (and the future Ákr.).

4. Conclusions

The question posed by the research was to what extent the regulation of the freedom of information was in compliance with the Rules of Administrative Proceedings **(**Ket.) regarding the right of inspection of and access to documents in concrete cases. Based on the above, it can be concluded that the rules of Infotv. and Ket. on the right of inspection of documents are roughly in harmony with each other, which is partly due to a Ket. amendment of 2008, which was partially aimed at this, and which is rather fortunate because there is nothing to justify that the rules governing the documents (data) under the effect of Ket. are different from those other data of public interest which are not subject to Ket.

This, however, does not mean that no further research is necessary on this subject, or that the legislator has nothing to do any more. The situation is that the roughly coherent regulation is by far not self-apparent at first sight – this is why this research was conducted at all –, it would make sense to add a few clarifying rules. On the one hand, Infotv. should be supplemented by references to the sectoral and occupational secrets. Furthermore, although the justification of Ket. contains a reference to the right of access to data of public interest, it would also be worthwhile to make this correlation clear in the very text of the law as well. Also, there is a narrow area where it is clear that there is no harmony: these are the rules of cost refunds related to making inaccessible data unrecognizable, which will lead to a different result if one wishes to access an item of data in the context of requesting data of public interest and if one wishes to use the right of inspection set out in Ket.. It is true that so far, this has not caused any problem whatsoever, according to the relevant legal practice. However, some other, yet unclarified questions of interpretation may arise in relation to some further details, for example, when determining the nature of certain documents as ones that underlie or prepare the decisions, with regard to the limited right of inspection „for a reasonable private interest" upon the client's request [Section 69(2) of Ket.], or regarding the duration of the limitation of access.

All in all, I agree with a conclusion from the Commentary that „if one wishes to inspect the documents, or request a copy, then a rather considerable analysis of content will become necessary

[33] Cf. [5], p. 541., translation of the original Hungarian text.

[34] See also, the wording of Bianka Maksó, who says that „all such documents which are generated during the proceedings or decision-making process of any bodies or persons which or who fulfil state, local government, public administration or other public responsibilities, and the use of which contributes to the lawfulness, professionalism and effectiveness of the final decision, may be listed in this category" (translation of the original Hungarian text) [9].

for even deciding what procedure the request in question should belong to" [5].[35] and also, this especially holds true for finding out whether one is talking about accessible or inaccessible data.

This essay has focused on and showed the provisions of the Ket. in detail, but it seems, that the new regulation of the public administration procedure, the Ákr. contains very similar provisions, so no significant changes can be expected, and these consequences are going to be true in the new legal environment, too.

The lessons of this analysis about Hungary may be useful also for other legislations. It is important, that Freedom of Information Law should be in compliance with many other fields of law, namely with the procedure of public administration, otherwise specific regulation may deteriorate the right to access to information, even if freedom of information is regarded as a fundamental right.

Besides these findings, this research also brings up quite a number of other relevant questions which refer to the confidentiality regulation. How compliant are the individual types of secrets regulated by the Hungarian law with each other? What does the difference between business secrets, as well as sectoral and official secrets lie in? Would the rules governing these types of secrets stand the test of the restriction of the freedom of information as a fundamental constitutional right? And especially, how do the sectoral and official secrets relate to the public disclosure of data of public interest when these affect the use of public funds or the utilization of public property? These are the many questions which can only be answered by the findings of further research efforts.

5. References

[1] ASBÓTH, M.: A közérdekű adatok nyilvánosságának legújabb jogszabályváltozása [The Latest Changes in the Law on the Public Disclosure of Data of Public Interest], in: M. Fazekas (ed.), Gazdaság és közigazgatás: tanulmányok Ficzere Lajos tiszteletére [Economy and Public Administration: Studies in Honor of Lajos Ficzere], ELTE Eötvös Kiadó, Budapest 2015.

[2] BALOGH, ZS. GY.: Jogi informatika [Legal Informatics], Dialóg Campus, Budapest-Pécs, 1998.

[3] BALTHASAR, A.: Right of Access to Information? Prolegomena to a rising issue with due consideration of the legal nature of information, in: A. Balthasar and M. Sully (eds.), Public Sector Information – Open Data –. What is fair: Free Access or Fees? Facultas Verlags- und Buchhandels AG, Vienna 2014.

[4] BANISAR, D.: Freedom of Information Around the World 2006., Privacy International 2006. http://www.humanrightsinitiative.org/programs/ai/rti/international/laws_papers/intl/global_foi_survey_2006.pdf (accessed 12 December 2016)

[5] BARABÁS, B., BARANYI, A. and KOVÁCS, A. GY.: (eds.), Nagykommentár a közigazgatási eljárási törvényhez [Commentary on the Public Administration Act], Complex, Budapest, 2013.

[35] Cf. [5], p. 534., translation of the original Hungarian text.

[6] DIX, A.: The influence of Hungarian Freedom of Information legislation abroad – The Brandenburg example and experience, in: L. MAJTÉNYI (ed.), Az odaátra nyíló ajtó. The Door onto the Other Side, Adatvédelmi Biztos Irodája, Budapest 2001.

[7] GURIN, J.: Open Data Now, McGraw-Hill Education, 2014.

[8] MAJTÉNYI, L.: Információs szabadságok – adatvédelem és a közérdekű adatok nyilvánossága (Information Rights – Data Protection and Freedom of Information), Complex, Budapest, 2006.

[9] MAKSÓ, B.: Kivert biztosíték? – Az információszabadság a döntés megalapozását szolgáló adatok korlátozott nyilvánosságának tükrében [A Blown Fuse? – The Freedom of Information in view of the Limited Public Disclosure of the Data Underlying the Decisions]. Infokommunikáció és jog, No. 5-6, 2012.

E-GOVERNANCE AND THE NIGERIAN TAX ADMINISTRATIVE SYSTEM

Catherine Enoredia Odorige[1]

Abstract
Nigeria like most countries who were 'unfortunate' to have rich deposits of natural resources has been 'battered' greatly by the economic paradox known as resource curse. Dependence on oil exploration and export meant that politics was played with taxation which remains the oldest and most recognized form of generating revenues for the provision of infrastructures and smooth running of the state. The global fall in crude oil prices, high rates of unemployment and agitations from the population for improved service delivery, has awakened the government to the fact that the days of treating tax revenue collection as favour to political faithful are over.

This paper takes a look at the application of information technology efforts by the Nigerian government towards reinforcing revenue generation. It will analyze how the present use of information technology in Tax administrative system has helped to check hitherto exploited loopholes of the revenue administration and to make recommendations towards improvements.

1. Introduction

Taxation remains the oldest and main source of revenue generation for most economies in the world. Oldest in the sense that before Adam Smith conceived of his Wealth of Nations in 1776, there were already records of the Roman taxation system. (Donald 1974). The 40 percent tax paid by the ancient Hebrews to Rome during the time of Christ was reason enough for why they sort for a messiah that will deliver them from this bondage.[2] Historians reported a heavier burden on the French of 81 percent on their income prior to their famous revolution.[3] 17th century consumption tax in Britain is what is today known as customs and excises, where every consumable were taxed as ministers of finance were constantly under pressure to supply more funds as Britain was at war.[4] Prior to industrial revolution in mid-19th century, feudal custom rights made for a compulsory toll fee on traders' goods payable at the frontiers on the Weser-Elba water ways. Within every 12 kilometer there was an average of eight tolls payable over 240 kilometers between Milan to Florence. Marjan (2014).

The Nigerian nation is not left out among nations who depended on taxation as a source of revenue generation in order to be able to meet with the needed revenue for the operation of the state, though the discovery of crude oil was diversionary. As the envisaged big bucks coming from the 'liquid gold' as crude oil was popularly called, did not allow for efficient tax collection especially in a system rife with corruption.

[1] National University of Public Service Budapest, Hungary.
[2] Curran J. Donald (Ed) (1974) *Tax Philosophers: Two Hundred Years of Thought in Great Britain and the United States,* London United Kingdom, The University of Wisconsin Press.
[3] Ibid
[4] Ibid

E-governance and public administration has brought about efficiency and transparency in the delivery of public service in developed nations. Nigeria has in the millennium age begun to apply the internet to public administration and this is beginning to make a difference in the way taxation is perceived and administered.

1.1 Definitions of Taxes

Taxes are defined as general or involuntary fees levied on individual or corporations, by the government entity whether local, regional or national in order to finance government activities. In economics taxes fall on whoever paid the tax burden, the entity being taxed like a business or end consumers of the business goods.[5] Tax is also regarded as the citizen's share of the government's burden. Taxation is the means by which resources are made available for the provision of public good which benefits the populace. Such public goods are the provision of infrastructure public health and the maintenance of law and order.[6] Taxation refers to the enforced proportional levies imposed on the persons and properties by the state by virtue of its sovereignty[7]. The origin of the word is traced to the Latin word 'taxare' which means to estimate…someone's wealth or the price of certain goods for the purpose of taxing them. Marjan (2014). Taxation as an economic policy could support preferred activities by a targeted tax regime and roll back others by higher taxation. Marjan (2014). Regular classification of taxes is by ***direct taxation*** paid directly to the government on the persons on whom it is imposed. And ***indirect taxes*** collected by proxy such as the retail store from the consumer.[8] Nigeria by virtue of her sovereignty apply taxation on its citizens to generate funds for governance as enshrined in the constitution, but scholars have pointed to the non-definition of the term taxation by the tax laws of Nigeria invariably taking it for granted that all ought to know what taxation means[9].

2. Pre-colonial Tax Systems

Taxation in Nigeria pre-dates the colonial era. Kingdoms and communities which according to Sir Hugh Clifford the Governor General of Nigeria between 1923-1956 are a collection of independent Native states, separated from one another by great distances, by differences of history and traditions and by ethnological, racial, tribal, political, social and religious barriers. (Anuforo, 2013: Pp1&2).[10] This narrative was evident in the larger groups of the Hausa-fulani kingdom, Yoruba kingdom, Igbo kingdom, Benin kingdom, Nupe kingdom and the several minority groups like the Idomas, Tivs, Ijaws, Urhobos, Itsekiris, and Ibibios. They each had developed forms of levies, taxation on their 'citizens' for the needed revenue to be able to meet the day to day running of their kingdoms. These taxes come in form of 'zakkat' 'kudin-kasa' 'shuka-shuka' belonging to the Hausa-Fulani northern part of Nigeria, 'ishakole' 'owo-ori' to the Yoruba of western Nigeria.[11] The tradesman ship of the Benin kingdom in crafts and artifact produced by craftsmen and administered by the various groups

[5] http://www.investopedia.com/terms/t/taxes.asp retrieved 20 November 2016
[6] OECD (2014), "Fundamental principles of taxation", in *Addressing the Tax Challenges of the Digital Economy*, 26th November 2016
[7] Thomas Cooley M. (1879), *A Treaties of Law of Taxation: Including the Laws of Local Assessments*, Chicago, Callaghan.
[8] Marjan Attila (Ed), (2014), *European Economic and Monetary Integration,* Budapest, Hungary. National University of Public Service.
[9] http://www.nigeria-law.org/BusinessInNigeriaTaxation.htm https://eirs.gov.ng/tax-law/ retrieved 10th December 2016.
[10] Cited in Negedu Isaiah and Atabor Augustine*, Nationalism in Nigeria; A Case of Patriotic Citizenship*, American Journal of Contemporary Research, Vol. 5 No.3 June 2015. Retrieved 12th June 2016
[11] ICAN, Introduction to Nigerian Tax System.

of 'iwebo' 'iweguae' and 'ibiwe'. They oversee to the provisions of the palace and the community needs from resources realized from trade, tributes and levies from the people and smaller communities who hold allegiance to the Benin kingdom.[12] These disparate groups were brought under one nation called Nigeria in1914.

2.1 British -Colonial Tax Administrative System

Tax administration under colonialism was by 'rule of the thumb'captured by Malecki (1991) that colonies were made by and for the mother country with primary development of natural resourse of the colonies for the mother country. Taxes was on individuals, properties and co-operate entities. Financial statements for individuals (income tax), financial statements for businesses (corporate tax) were not developed and this created room for sharp practices by tax administrators and resentments by the public which led to the various unrests like the Aba women's riot of 1929 and the Agbekoya riots of 1969 [13] The Raisman Commission, introduced the uniform basic income tax principles subsequently incorporated into the 1960 independence constitution of Nigeria, leading to the promulgation of the income tax act and the company tax act of 1961[14],

2.2 Post-colonial Tax System

Nigeria discovered crude oil on January 15 1956 in Oloibiri in Ogba local government area of Bayelsa state in the Niger-Delta by Shell Bp- petroleum[15] . Prior to this discovery agriculture was her economic mainstay. Agricultural production gave Nigeria an enviable record of food sufficiency as well as placing her in the limelight of global trade and exports (Oluwasanmi 1960: 34-36)[16]. Mangrove region of southern Nigeria with high rainfall per annum supports the growth of palm trees, rubber, coffee and cocoa etc. The savannah grassland to the north supports the planting of cereal and leguminous crops such as sorghum, millet, ground nuts (groundnut pyramids in Kano) as well as animal rearing mostly for hide and skin Ekundare (1973:55-56[17]) Palm oil had been an export commodity in Nigeria as early as 1558, (Olukoju 2009:105-125).[18] Cotton joined the export list in 1856, while cocoa from western Nigeria made its debut in 1874; Oyedele (2007)[19]. Revenue from agriculture was appropriately used to build landmark social and economic infrastructure, providing basic services like education, health, water and electricity supply, and gave the country tremendous self-sustaining growth. Agriculture met up to 95% of the food needed to feed Nigerians and contributed 64.1% Gross Domestic Product (GDP) and employed over 70% of Nigerian

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[12] Osagie Joseph and Ikpomwosa Frank, (2015), *Craft, Guild and the Sustenance of Pre-colonial Benin Kingdom,* International Journal of Arts and Humanities, (IJAH) Bahir-Dar Ethiopia Vol. 4(1), S/No 13, retrieved 24th December 2016

[13] Oseni Michael, (2015) Sustenance of Tax Administration by Information and Communication Technology in Nigeria, Archives of Business Research 4 (1) 47-54

[14] Ibid

[15]http://www.nnpcgroup.com/NNPCBusiness/Businessinformation/OilGasinNigeria/IndustryHistory.aspx retrieved 28th November 2016

[16] Oluwasanmi, H.A. (1960), *Agriculture and Nigerian Economic Development*, Ibadan, Oxford University Press.

[17] Ekundare, R.O. (1973). *An Economic History of Nigeria,* 1860-1960: London Great Britain, Richard Clay the Chaucer Press LTD.

[18] Olukoju, K.,(2009), "*The United Kingdom and the Political Economy of Global Oils and Fat Business during the 1930,"* Journal of Global History, Vol. 4, (1) 1.

[19] . Oyedele, J.O., (2007), *Enhancing the Sustainability of Cocoa Growing in Nigeria. A Paper Presented at the ICCO Roundtable Congress on Sustainable World Cocoa Economy at Accra,* Ghana. 3rd – 6th October. Cited in Ndubuto Ifeanyi Nwanchukwu, et'al, *Competitiveness and the Determinants of Cocoa Export from Nigeria* http://www.sciencepub.net/report/report0207/08_3470report0207_51_54.pdf. Retrieved 28th November 2016

population before oil exportation commenced (Oluwasanmi 1960: 23-29)[20]. In the later years, rubber and Bennie-seed followed as major valuable cash crops. These cash crops were the main source of revenue, export and foreign exchange for the government (Udo 1967: 18).[21]

Military incursion into politics from 1966 and the absence of parliamentary deliberations and decisiveness needed to wade in to stop the descent into mono product dependence, allowing the country to gradually slide into export dependence which brought about vast unemployment. Lack of accountability in military dictatorships entrenched corruption, and promoted the wasteful and un-impactful execution of elephant projects. Military regimes lacked administrative direction for the relationship between tax collection and the provision of social amenities like electricity, pipe-borne water, good road connectivity security of lives and property for its citizens. In a survey by James Abiola and Moses Asiweh (2010)[22], there seem to be a clear demotivation to pay taxes due to the fact that the need to pay taxes was unobvious because the state was derailing on her role to provide social and infrastructural needs for the population.

3. Tax Governance

Tax administration in Nigeria is divided between the three levels of government authorities with each having an area of jurisdiction for which it collects taxes:

- Federal Inland Revenue Service, (FIRS) is the federal arm. It's area of tax jurisdiction are Companies income tax and Personal income tax of federal civil servants, military and paramilitary residents of the federal capital territory, staff of ministry of foreign affairs and non- resident individuals, Petroleum Profit Tax, Value-added tax (VAT), Education tax, Capital gains tax for Abuja (the capital of Nigeria) residents and corporate bodies, withholding tax, Stamp duties involving corporate entity

- State Internal Revenue Service (SIRS) the state arm, collects the following taxes: Personal income tax, Capital gains tax, Stamp duties, toll fees, Pools betting, lotteries, gaming and casino taxes, Business premises registration and renewal levy, as defined by each state, development levy with a recommended registration fee of 10,000naira average of 30dollars and 5000naira annually, an average of 15dollars, certificate of occupancy, (paid on private properties usually for a period 99years), fees for granting street name, and markets stall rates and consumption tax (recently adopted by some states in the federation)

- The Local Government Revenue Committee (LGRC) collects taxes in the following areas: Tenement rates, shops/kiosks levies, liquor license, abattoir fees, Marriage/birth/death registration fees, local market/motor park fees, domestic animal license, Bicycle, truck, canoe, wheelbarrow and cart fees, Cattle tax, 'merriment' and road closure fees, (a fee for the granting of permission to part(s) of a road for the purpose of a ceremony, merriment here is in

[20]Cited in Paul Ilesanmi Akanmidu, (2015) *A Historical Perspective of Petroleum on Nigeria's Economic Crisis since Independence,* Global Journal of Human and Social Science. Inc. USA ISSN2249-460X E-Economics. Retrieved 20th December 2016

[21] Udo R.K.,(1967). *"British Policy and the Development of Export Crops in Nigeria N*igerian Journal of Economic and Social Studies, 9, 2 retrieved 12th December 2016

[22] James Abiola and Moses Asiweh, (2012*) Impact of Tax Administration on the Government Revenue in a Developing Economy: A case Study of Nigeria* International Journal of Business and Social Science Vol. 3 No. 8 [Special Issue April 2012 Retrieved 29th November 2016

parenthesis because ceremonies are not only for merriment purposes), parking/default parking charges, Public convenience, sewage and refuse disposal fees, burial ground and religious places permits; and Signboard/advertisement permit.[23]

These three tiers of tax governance in the country also collaborate under the auspices of the Joint Tax Board. The structure of the Nigerian tax system is divided into a tax policy, tax legislation and tax administration. The tax policy gives structure to the national tax system and it forms the base of tax laws. Tax legislation is the deliberations of choices and directions to take and it provides the legal backing that makes the tax laws effective and authoritative. Finally tax administration is the implementation aspect of the national tax system.

Some of the challenges of the tax administration are:

- Tax evasion and avoidance
- Poor compliance or under reporting
- Failure in tax administration and enforcements
- Corruption and rule of the thumb
- Incidences of fake tax administrators
- Lack of effective operational tools.
- Double taxation of individuals and corporate entities due to issues of jurisdiction of the various tiers of government in the business of tax collection.
- Lack of a comprehensive data base for citizens identification is a challenge

The state of decadence of the challenge of tax avoidance and evasion is best captured in the briefing by the Chairman of the Independent Corrupt Practices Corporation ICPC Mr. Ekpo Nta before the senate committee on drugs, narcotics financial crimes and anti-corruption when he reported that out of 156 contractors with the federal ministry of works 50 operated with fake tax certificates, this represents one third equal to 32% forgery found in one agency alone (Vanguard Newspapers editorial 2015)[24]. This is a testimony of the level of loss in taxation. These are contractors dealing with government agencies. Imagine those whose direct clientele has no relationship with government! This will be more because there is less fear of being checked or caught.

According to Lopez and Kadar (2001)[25] taxation among Organization for Economic Development Countries (OECD) had uniformly been geared towards efficiency, increased tax revenue, equity and

[23] Taxes Levies Approved (list of collection) Decree No 21 of 1998 Laws of the Federation of Nigeria http://www.nigerial-law.org/Taxes%20and%20Levies%20(Approved%20list%20for%20collection)%20Decree%20No%2021%20of%201998.htm

[24] Cited in Oseni Micheal, (2016), *Sustenance of Tax Administration by Information and Communication Technology in Nigeria,* Archives of Business Research 4 (1) 47-54

[25] Lopez, A. and Kadar, Z (2001) "Introduction". *International Tax Review: World Tax 2002,* 1st Jan: 6-11Cited in James Abiola and Moses Asiweh, 2012) Impact of Tax Administration on the Government Revenue in a Developing

enforceability. This may not be unconnected with the level of growth and development in these countries. But much is still left to be desired with regards to tax administration in Nigeria and the function it is supposed to serve. Put succinctly by Nightingale (2002)[26] it is payment imposed by government while taxpayers may receive nothing identifiable in return for their contribution." Much as the citizens should not expect that *government must do something within the locality of the taxpayer* because of his tax contribution - Osunkoya (2009)[27], evidence of taxation as seen in public infrastructures encourage the taxpayer. Infrastructural decay account for the high rate of tax evasion which is assumed to be exploitative as against a means of growth and development.

4. Theories of taxation

Literature on taxation dates back to the middle of the seventeenth century British society, focusing on her international growth and furthering export and favourable balance of trade. Much debate focused on whether high or low wages was more advantageous as a strategy for success in the international rivalry. These were the days of *Benefit theory* of taxation which says that a person or corporation should pay for what he gets. Benefits were measured by consumption. Hobbes in his Leviathan, "The equality of imposition 'consisteth' rather in the quality of that which is consumed than of the riches of that which consume same. In the same vein these other writer stress taxes on luxuries. Sir William Petty and Thomas Mun summarize their theory of 'you can't take a shirt of a naked man'. In Adam Smith's *Wealth of nation*s he avers that governments spend other people's money and lack the self-interest motive. Much as Smith is no anarchist and recognizes the relevance of government to the society, his bias with that of other classical economists against government was obvious and informs his formulation of the maxims of taxation.

a. Taxes should be equal and equitable-joint tenant of a great estate.

b. Certain and not arbitrary- clear and plain not subject to extortion

c. Convenient – timing and manner

d. Economical- not too expensive that will be discouraging to the taxpayer[28]

4.1 *The Ability to Pay* Theory

This has been described as progressive taxation; collectable from those that has and must be seen as a sacrifice on the part of the payer.[29] Similar to the ***proportionate principle*** promoted by John Stuart Mill, proportionality should determine tax rating, to achieve equality of sacrifice.[30] This is the Pay As You Earn, PAYE principle prevalent in tax administration.

Economy: A case Study of Nigeria International Journal of Business and Social Science Vol. 3 No. 8 [Special Issue April 2012

[26]Nightingale, K. (2002) *Taxation theory and practices*. England, Pearson Education Ltd.

[27]Osunkoya, D (2009) "*Nigeria Tax system needs autonomy".* Retrieved 19th Dec. Available from: http://234next.com/csp/cms/sites/Next/Money/Finance/5499086-147/story.csp.Cited Ibid

[28]Curran J. Donald, (Ed) (1974), *Tax Philosophers, Two Hundred Years of Thought in Great Britain and the United States,* London, The University of Wisconsin Press.

[29] Kendrick Slade, (1939), *Ability to Pay Theory of Taxation,* America Economic Association, Vol. 29, No. 1 (Mar., 1939), pp. 92-101 URL: http://www.jstor.org/stable/1806989

[30]Ekelund B. Robert and Walker M. Douglas, (1996*), J. S. Mill On the Income Tax Exemption and Inheritance Taxes: The Evidence Considered* http://piketty.pse.ens.fr/files/EkelundWalkeronMill(HPE1996).pdf Retrieved 25th December 2016

4.2 *The cost of Service* Theory

The cost of Service Theory of taxation focuses on the idea of equity and justice in its proposal that cost of services should be equivalent to tax paid but this principle has been rejected on the ground that there is *no quid pro quo* in taxation as there is no way of measuring the cost of police, judiciary, armed forces, prisons services and the many other services rendered by government that cannot be quantified[31].

4.3 Taxation in Developing Countries

The public finance literature focuses on the optimal rates structure under the personal income tax as a means of best trading off equity and efficiency consideration in the collection of taxes. Gordon (2010) in a research carried on six developing countries discovered that this assumption is only characteristic of developed nations as the results of the research showed that personal income tax plays little role. They presumed that this phenomenon is as a result of the inability of the tax agencies to monitor the income accrual to individuals to make judgments on deductions, as a result income tax is not exploited to advantage in developing countries. Tax revenue is mostly from value added tax (VAT) also heavily applied in developed nations, commonly cushioned by safety net programmes for the poor, virtually non-existent in developing countries; therefore tax burden on the poor is more. Taxation that is ill-developed in terms of income, is connected to low level information technology usage in these developing nations.

5. Technology and Efficient Tax Administration

The internet, a complex technological system consisting of the communication backbone, the local access point, local network and packet switches and terminals for the connectivity of individuals with various internet capable devices transmit signals that are reassembled at the destination, Kogut (2003).[32]On the American digital economy Moulton (2000) describes as perfect capture of the economic statistics on earnings from production and benchmarked to tax administrative data. Efficiency and profits are key determinants in the adoption of new technologies. Mokyr (2002). The essential feature of cyberspace is connectedness and aims at breaking down boundaries and walls. Rifkin (2000). Information technology in the form of knowledge based economy with the potential of blurring distance comes as an ever pressing need to align national strategies with world-wide movements towards a global information society UN 2000. If taxation is to the nation what blood is to the individual, Cooley (1881).[33] diverted by the by the availability of natural resources, described as the resource curse by scholars because of the rent seeking attitudes that natural resource has generated in many nations, 'so-blessed' Nigeria being one of them.[34] Regardless of Deacon (2011) position that common sense and simple economics imply that natural resource abundance should confer benefits, yet, Nigeria's per capita GDP in 2000 was 30% lower than in 1965, despite oil revenues of roughly $350 billion. Anecdotal sounding statement like this one by Bill Clinton *"With its vast human and natural resources, a revitalized Nigeria can be the economic and political anchor of West Africa* …… United States Bill Clinton" Sheik Ahmed Yamani, former Oil Minister

[31] http://economicsconcepts.com/theories_of_taxation.htm
[32] Kogut Bruce, The Global Internet Economy, London, United Kingdom MIT Press, Cambridge Massachusetts (200)
[33] Cooley, Thomas M. "*Remedies of Illegal Taxation."* Am. L. Reg. 29 (1881): 1-16.
[34] Deacon T. Robert, (2011), *The Political Economy of Natural Resource Curse: A Survey of Theory and Evidence*. Hanover USA, Now Publishers Incorporated. http://www.nowpublishers.com/article/Details/MIC-042

of Saudi Arabia: *"All in all, I wish we had discovered water."* Ross (1999)[35] Administrative changes from the reform perspectives is the result of deliberate goal oriented choices. Brunsson and Olsen (1993). Conscious changes have to be applied to the Nigerian tax administration as part of efforts to revitalizing her economy.

5.1 New ICT Tax Administration Applications in Nigeria

The application of information technology is changing the phase of Nigerian administration systems, with the country's development of an information technology policy since January 2000[36], acknowledging the vital role ICT plays in the nation's development plan. The federal inland-revenue service, the body charged with the responsibility for tax administration has since keyed into this policy plan. More practical steps have been applied by the board to change the way Nigerians can access tax payments electronically. A significant synchronization of tax administration in Nigeria is the introduction of TIN (Tax Identification Number. A computer generated unique identifier which has the ability to drag all taxable Nigerians into the tax net. The website design of the FIRS and some states webpage show how payments can be made for various types of taxes. Much as websites of some Nigerian agencies, parastatals and ministries have been categorized as primarily for public affairs, UN (benchmarking and e-government 2002)[37] the FIRS cannot afford to play public affairs with its websites because efficient and result oriented tax administration depends on proper working of icons on its webpage.[38] But some states web online tax administration is more advanced than others an example is the Edo state webpage where you are can get the TIN number on first visit to the webpage by filling in a couple of information.[39]

The major turn in tax administration in Nigeria took place in 2007 with the granting of financial and administrative autonomy to the Federal Inland Revenue Service through the Establishment Act 2007. Changes in tax administration since 2004 cuts across states and federal authorities by way of organizational restructuring, enactment of national tax policy, funding, legislation, tax education, dispute resolution mechanism, taxpayer registration, human capacity building, automation of key processes, refund mechanism and several other areas discussed in the in the handbook of FIRS taxation reforms 2012.[40] The positive results of these changes in application is obvious from the dramatic changes in the figures from 2004 in the publication of the World Bank/International Monetary Fund government statistics yearbook and data files, World Bank and OECD GDP estimates.[41]

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[35] This statement was erroneously credited to a William J. Clinton in this article as the president of the United States of America, but it was Bill Clinton that was the President of America at this time and he visited Nigeria in the year 2000 with his daughter, Chelsea.

[36] http://portal.unesco.org/en/ev.php-URL_ID=3107&URL_DO=DO_TOPIC&URL_SECTION=201.html

[37] Adeyemo A. B., (2011), *E-government Implementation in Nigeria: An Assessment of Nigeria's e- Gov. Ranking*, Journal of Internet and Information System, Vol. 2 (1) pp. 11-19. Available online at http://academicjournals.org/JIIS ISSN 1684-5315

[38] http://www.firs.gov.ng/

[39] https://eirs.gov.ng/ retrieved 28th December 2016

[40] http://www.firs.gov.ng/reforms-transformation/

[41] http://data.worldbank.org/indicator/GC.TAX.TOTL.GD.ZS?locations=NG

Year	GDP	PPT	CIT	CUS&EXC DUTY	VAT	TOTAL
2000	4727522	525100	51100	101500	58500	736200
2001	5374339	639200	68700	170600	91800	970300
2002	6232244	392200	89100	181400	108600	771300
2003	6061700	683500	114800	195500	136400	1130200
2004	11411067	1183600	113000	217200	159500	1673300
2005	15610882	1904900	140300	232800	178100	2456100
2006	18564595	2038300	244900	177700	221600	2682500
2007	23280715	1600600	275300	241400	289600	2406900
2008	-	-	-	-	-	-
2009	24048480	–	–	–	–	219760
2010	24712670	–	–	–	–	283000
2011	24712670	998561	2041127	2437	259000	3301125
2012	71491275	2352570	700000	5787	534698	3593055

Table 1: GDP and Federal Tax Revenue Generated over the Years (N'Million)
Source:[42]

Research on the application of ICT in tax administration in developing counties by KFW Development Bank[43], on integrated tax administration system ITAS the functions of ICT driven tax administration systems is highlighted as:

- Registration of taxpayer
- Return process
- Billing and collection process
- Tax payers accounting process
- On-line self service
- Revenue accounting process
- Case management processes
- Security processes.

[42] Ordu Promise and Anele Clement, (2015), *A Performance Analysis of Nigerian Tax Actualization: Evidence of 2000-2012,* International Journal of Management Sciences and Business Administration, Volume 1 Issue 6 May 2015 Pp 88-100 http://researchleap.com/a-performance-analysis-of-nigerian-tax-objectives-actualization-evidence-of-2000-2012/
[43] Blume Jonas and Bott Maja, (2015), *Information Technology in Tax Administration in Developing Countries*, KFW Development Bank

6. Conclusion

Much has been achieved through information technology to improve the Nigerian tax system. But for ICT application the milestones achievements that has been recorded would have been impossible. Yet more still needs to be done the by way of electronic administration, as some of the icons on the FIRS websites are yet to be functional. Only few states and local tax authorities have applied information technology in the proper sense of online services. Much of their activities is still based on the rule of the thumb.

The many years of single commodity revenue dependence as was the case with crude oil revenue, would need much of economic policy instruments to roll back economic dependence on petroleum sector. One policy that also helped to encourage many to get on board is government subsidies of local petroleum product sales which is characterized by falsification and corrupt practices. Economic policy instruments for preferred activities by way of tax relief or reduction in the areas of agriculture, packaging and industrialization to diversify the economy would have to be increased to encourage more investments in these areas that will increase employment and increase revenue by way of taxes (personal income tax and company tax).

The relationship between the benefit theory and cost of service principle of taxation is obvious in the state of infrastructural decay in some Nigerian capitals where infrastructure which tax deductions are supposed to provide for, is still sourced privately. Analysts have correlated this as resulting in the high incidence of tax avoidance. Citing Lagos state where there seem to be higher compliance in tax payments to the level of impacting infrastructural development in the state. So as much as governments look forward to increased tax levels people want to see evidence of what the taxes are doing especially in a country like Nigeria where there is suspicion of the government motives due to the perennial challenges of corruption and the resultant underdevelopment.

The challenges associated with jurisdiction in tax collection between the three tiers of government has to be checked despite the 1998 decree that spelt out spheres of tax collection of the various tiers, there are still controversies that has brought about many cases in the courts between states and federal government especially with VAT value added tax.[44] These tax laws have to be reviewed and proper delineation drawn for the promotion of better understanding and relationship between this three tiers in relation to distributive justice, recognition and accommodation of differences in spheres of operation and procedural justice responsiveness and transparency[45] in intergovernmental relationship Diamond (1974) all political institutions are intelligible in the light of the purpose or ends for which men device them to serve.

6.1 Recommendations

Accuracy in ICT application can bring about efficiency and equity which has been identified as the major principle of taxation. Effectively developed e-taxation system has the ability to eliminate the retinue of tax preparers, collectors, accountants, lawyers, auditors, security agents and consultants

[44] Asuquo Richard Gregory, (2014) *Tax System in Nigeria: Issues and Challenges* http://www.vanguardngr.com/2014/03/tax-system-nigeria-issues-challenges/ Retrieved 28th December 2016

[45] Simeon Richard, *Federalism and Social Justice: Thinking Through the Tangle* in Greer Scott L. (Ed*) Territory Democracy and Justice, Regionalism and Federalism in Western Democracies*, New York USA, Palgrave Macmillan 2006

used in a typical rule of the thumb style of tax collection. Here are some ways to enhance effective tax administration:

- Develop a common and uniformed strategy involving all stakeholders with regards to communication and implementations of tax policy.
- Improve and stabilize electricity generation which is the basis of e-connectedness.
- Develop a single end point electronic tax collection point that cannot be sabotaged thereby eliminating the collection of physical cash which are mostly not accounted for.
- Split up change initiatives in manageable bits with accurate information sent to tax payers.
- Functional ICT solutions should be implemented while language on the webpage should be as clear and simple, avoid unnecessary specialized administrative terminologies in the public domain. Some authors have recommended designs in local languages, but the problem with this is that Nigerian basic education is English. Majority of Nigerians learn to read and write in English language before their local languages.
- In tax design the ability to pay principle must be upheld so as to discourage tax avoidance.
- The principle of reward and punishment should be applied equitably in tax administration, just as authorities go after tax defaulters in punitive justice with all available resources, tax rebate should be given for tax compliance because the resources used to apply punitive justice can be costly so a little resource should be used to encourage more compliance, especially voluntary compliance like FACT Factual Accurate Complete and Timely.
- Public enlightenment on the use of ICT for tax payments has to be enhanced and some have recommended the re-introduction of the much needed civic education into primary and secondary schools by way of preparing citizens to be ready for their civic obligation to the government.
- ICT in tax administration has the potential to attract Foreign Direct Investment (FDI) as potential investors can see clearly tax administration and determine if it favourable for investment or not.
- Publication of tax defaulters on the web pages can serve as a deter rant as most corporations may not want to be so embarrassed.
- Importantly the Joint Tax Board must scout for and find out best tax practices that can be applicable to the Nigerian environment. Take for example the MOSS Systems for telecommunication broadcasting and electronic services adopted in Hungary and the European community for tax administration covering all member states. Here businesses registered in the European community can be administered through this one stop shop regardless of location of branches. The provision/purchase of the internet electronic machine which documents and records receipt transactions at source prevent to a large extent any form of manipulations. Customer's consciousness just has to be aroused to demand for their

receipts. Also there is a page where questions bordering on tax administration can be asked and response given[46]

- It has become imperative for government to make internet access a key policy to guarantee broader equitable access of the public network. Wilsdon (2001)

7. References

[1] ABIOLA, J. and ASIWEH, M.: Impact of Tax Administration on the Government Revenue in a Developing Economy: A case Study of Nigeria, International Journal of Business and Social Science Vol. 3 No. 8Special Issue April, 2012.

[2] ADEYEMO, A. B.: E-government Implementation in Nigeria: An Assessment of Nigeria's e-Gov. Ranking, Journal of Internet and Information System, Vol. 2 (1) 11-19, 2011.

[3] ASUQUO, R. G.: Tax System in Nigeria: Issues and Challenges 2015 http://www.van guardngr.com /2014/03/tax-system-nigeria-issues-challenges/

[4] BLUME, J. and BOTT, M.: Information Technology in Tax Administration in Developing Countries, KFW Development Bank, 2015.

[5] BRUNSSON, N. and OLSEN, J. P.: Reforming Organization, Routledge London, 1993.

[6] COOLEY, T. M.: Remedies of Illegal Taxation. Am. L. Reg. 29, 1881, 1-16.

[7] CURRAN, J. D. (Ed.): Tax Philosophers: Two Hundred Years of Thought in Great Britain and the United States, The University of Wisconsin Press. London United Kingdom, 1974.

[8] DEACON, T. R.: The Political Economy of Natural Resource Curse: A Survey of Theory and Evidence. Now Publishers Incorporated. Hanover USA, 2011.

[9] ECONOMIC COMMISSION FOR EUROPE, Internet Infrastructural Development in Transition Economies New York and Geneva, United Nations, 2000.

[10] EKELUND, B. R. and WALKER, M. D.: On the Income Tax Exemption and Inheritance Taxes: The Evidence Considered, J. S. Mill, 1996.

[11] EKUNDARE, R.O.: An Economic History of Nigeria*,* 1860-1960:, Richard Clay the Chaucer Press Ltd. London Great Britain, 1973.

[12] GEOFFREY, B. and JAMES, M.: The Power to Tax, Analytical Foundation of Fiscal Constitution, Cambridge University Press New York USA, 1980.

[13] ICAN, Introduction to Nigerian Tax System.

[46] http://ec.europa.eu/taxation_customs/frequently-asked-questions/citizens-web-site-faq_en

[14] ILESAMI, A.: A Historical Perspective of Petroleum on Nigeria's Economic Crisis since Independence, Global Journal of Human and Social Science. Inc. USA ISSN2249-460X E-Economics, 2015.

[15] KENDRICK, S.: Ability to Pay Theory of Taxation, America Economic Association, Vol. 29, No. 1, Mar., pp. 92-101, 1939, URL: http://www.jstor.org/stable/1806989

[16] KOGUT, B.: The Global Internet Economy, Cambridge Massachusetts MIT Press, London. 2000.

[17] LOPEZ, A. and KADAR, Z.: Introduction. International Tax Review: World Tax, 1st Jan, 2000, 6-11.

[18] MARJAN, A. (Ed): European Economic and Monetary Integration,. National University of Public Service, Budapest, Hungary, 2014.

[19] MALECKI, E.: Technology and Economic Development, Longman Scientific Tecnnical with John Wiley and Sons, New York, USA, 1991.

[20] MOULTON, R. S.: GDP and the Digital Econmy: Keeping up with the Changes, in BRYNJOFSSON, E. and KAHIN, B. (eds) Understanding the Digital Economy Data, Tools and Research. Cambridge Massachusetts, MIT Press. London, 2000.

[21] MOKYR, J.: The Gift of Anthenna, Historical Origins of Knowledge Economy, Oxford Princeton University Press United Kingdom, 2002.

[22] NDUBUTO, I. N. et'al: Competitiveness and the Determinants of Cocoa Export from Nigeria, 2010, http://www.sciencepub.net/report/report0207/08_3470report0207_51_54.pdf.

[23] NEGEDU, I. and ATABOR, A.: Nationalism in Nigeria; A Case of Patriotic Citizenship, American Journal of Contemporary Research, Vol. 5, No.3, June 2015, Retrieved 12th June 2016.

[24] NIGHTINGALE, K.: Taxation theory and practices, Pearson Education Ltd., England, 2002.

[25] OECD, Fundamental principles of taxation, in *Addressing the Tax Challenges of the Digital Economy,* 2014.

[26] OLUKOJU, K.: The United Kingdom and the Political Economy of Global Oils and Fat Business during the 1930, Journal of Global History, Vol. 4, (1) 1, 2009.

[27] OLUWASUNMI, H.A.: Agriculture and Nigerian Economic Development, Ibadan, Oxford University Press, London, 1960.

[28] ORDU, P. and ANELE, C.: A Performance Analysis of Nigerian Tax Actualization: Evidence of 2000- 2012, International Journal of Management Sciences and Business Administration, Volume 1, Issue 6, May, 2015, pp 88-100, http://researchleap.com/a-performance-analysis-of-nigerian-tax-objectives-actualization-evidence-of-2000-2012/

[29] OSAGIE, J. and IKPOMWONSA, F.: Craft, Guild and the Sustenance of Pre-colonial Benin Kingdom, International Journal of Arts and Humanities, (IJAH) Bahir-Dar Ethiopia Vol. 4(1), S/No 13, January, 2015, p.1-17, http://www.ajol.info/index.php/ijah/article/view/113901 retrieved 24th December 2016.

[30] OSENI, M.: Sustenance of Tax Administration by Information and Communication Technology in Nigeria, Archives of Business Research 4 (1), 2015, p.47-54.

[31] OSUKOYA, D.: Nigeria Tax system needs autonomy, 2009. Retrieved 19th Dec. Available from: http://234next.com/csp/cms/sites/Next/Money/Finance/5499086-147/story.csp.

[32] OYEDELE, J.O.: Enhancing the Sustainability of Cocoa Growing in Nigeria. A Paper Presented at the ICCO Roundtable Congress on Sustainable World Cocoa Economy at Accra, Ghana, 2007, 3rd – 6th October.

[33] PAUL, I. A.: *A Historical Perspective of Petroleum on Nigeria's Economic Crisis since Independence,* Global Journal of Human and Social Science, 2015, retrieved 20th December, 2016.

[34] ROSS, M.: The political economy of the resource curse, World Politics 1/1, 1999, p.297–322, Rifkin J.: The Age of Access, New York, Penguin Putnam Incorporated, 2000.

[35] SIMEON, R.: Federalism and Social Justice: Thinking through the Tangle in GREER S. L. (Ed*)* Territory Democracy and Justice, Regionalism and Federalism in Western Democracies, Palgrave Macmillan, New York USA, 2006.

[36] STIGLITZ, J.: Development-Oriented tax policy in Gordon Roger H., (Ed), Taxation in Developing Countries, Six Case Studies and Policy Implications, New York, Columbia University Press, 2010.

[37] Taxes Levies Approved (list of collection) Decree No 21 of 1998 Laws of the Federation FGN

[38] THOMAS, C. M. A.: Treaties of Law of Taxation: Including the Laws of Local Assessments, Chicago, Callaghan, 1879, http://www.businessdictionary.com/definition/taxation.html

[39] UDO, R.K.: British Policy and the Development of Export Crops in Nigeria, Nigerian Journal of Economic and Social Studies, 9, 2, 1967, retrieved 12th December, 2016.

[40] WILSDON, J.: Digital Futures, Earthscan Publications Ltd, United Kingdom, 2001

[41] YOHANNES, M. and SISAY, B.: General Theories and Principles of Taxation, http://www.abyssinialaw.com/study-on-line/item/1066-general-theories-and-principles-of-taxation, retrieved 29th November, 2016.

INTERNET ACCESSIBILITY AND THE AMBIVALENCE OF TRANSPARENCY

Jörg Dürrschmidt[1]

Abstract
As far as digital communication technologies are concerned, it is commonly assumed that social diffusion levels are high. This means that in terms of social uptake of these technologies generation gap, gender differential and social difference are growing smaller. However, in terms of adaptation and usage social milieus are still important. The first part of the paper shall discuss this general claim with regard to internet accessibility and political/governmental transparency. On the one hand, it has been argued that the internet simply is 'transparency'. It provides disclosure, information, puts elite behaviour out in the open, and potentially allows everyone to know almost everything about anything. On the other hand, people tend to filter abundant information through their habitus, and the capacity to turn facts to information and eventually in political opinion, tends to vary across social milieu. Seen from this perspective internet accessibility will not automatically improve transparency. Much rather the latter remains tied to the social distribution of social and normative knowledge. Thus while there might be a link between good governance and information availability to the public, government transparency that aims at inviting the public to participate via the net needs a better understanding of the social embeddedness of 'voice'. Moreover, the ubiquitous norm of virtual transparency as an impulse for more democracy might actually disguise the quest for true representativity in contemporary society, as the second more analytic part of the paper attempts to argue.

1. Introduction

In a more recent US study [24] a longstanding mantra is once again repeated: internet accessibility improves transparency of business and administration processes and thereby contributes to good governance. Based on the investigation of online county government transparency data the study argues that easy availability and constant access by citizens to government information helps to regenerate trust in government activities and to improve the perception of government by its people. Moreover, it enhances the potential for positive interactions between government and civil society. However, the study also points out that better internet access in itself will not automatically improve neither transparency nor governance. Instead, it would need a 'holistic approach' that looks at how internet access relates to other social aspects such as age, income and education. In other words, we need to take account of people's social milieus in order to understand the civic and political potential that might unfold via internet driven transparency.

The above mentioned study finds its wider frame of reference in the lasting debates on the condition of contemporary democracy and the ambivalent potential of internet democracy that go with it [cf. x, y]. Within this discourse, one line of argument declares independence of virtual democracy from all the evils and constraints of representative democracy. Seen from this perspective a transparent internet is at once a source of better information, a means of enhanced networking between the like-minded, and a tool of direct participation in decision-making processes of societal relevance. As

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such it gives a new lease of life to the ancient promise of democratic self-government by the people. The other line of argument maintains internet transparency in itself is not sufficient to cure the crisis of democracy as a form of government. Instead it has just as well the potential to work detrimental through information overload instead of access to relevant knowledge, self-referential networking in closed milieus instead of cross-societal exchange of opinion, and further polarization of opportunity with regard to participation instead of direct democracy. Debates on the 'digital divide' are intrinsic to both lines of argument. While the 'net-utopia' argument argues for a rapid closing of the gap that once separated 'onliners' and 'offliners', the 'net-dystopia' argument refers to a prevailing gap between social chances de jure/de facto when it comes to access and usage of internet transparency. In other words, while the former standpoint largely relies on the drivers of technological improvement, the latter maintains the contextualizing importance of social milieus.

In the following section these general issues shall be empirically grounded by referring back to the German context. Looking at the so called SINUS milieus, this should provide for a better understanding of the linkage between internet uptake, internet usage, and social milieu. Subsequently then the findings made in this brief social structural analysis of internet distribution and usage will help to re-approach in the second part of the chapter the more analytical agenda of transparency, representativity and democracy.

2. Internet and Social Structure – SINUS Milieus in Germany

Right from the emergence of the 'internet galaxy' [2] the sociological field of social structural analysis has been keen to advance understanding of the social structuration of internet access and usage across old cleavages (rich and poor) and new differences (life style) in society. Initially this attempt by and large followed an either / or pattern. Either the internet would follow other innovations in their typical 'trickle down' effect due to lowered access costs, improving user-friendliness and cultural diffusion. Or it would, despite a certain normalization of usage in everyday life, generate a particular pattern of 'info-haves' and 'info-have-nots' consistent with tendencies of social exclusion in general [15, p. 20]. While initial analysis focused on the standard indicators of socioeconomic status (income, education, professional position), later on these 'vertical' dimensions were complemented by 'horizontal' dimensions of the social structure (age and gender). Moreover, it increasingly dawned on researches, that internet uptake und online usage is not just dependent on socioeconomic outfit and level of formal education but just as much on certain skills such as self-efficacy and attitudes such as curiosity. Accordingly, attention of analysis has shifted towards a more nuanced understanding of the social embeddedness of internet participation within certain life styles. This is where the SINUS milieu approach comes in [14].

In general, SINUS Milieus aim at providing a comprehensive picture of the social landscape in Germany along two complementary axis of social stratification and differentiation (see graphic below): vertically in terms of social positioning according to socioeconomic status, and horizontally in terms of cultural preferences, value commitment and attitudes towards life and life style. Each of the social milieus thus identified, 'unite(s) people with similar tastes, practices, and comparable resources' [14, p.3]. Roughly speaking, the higher the milieu finds itself on the vertical axis the higher income and education level tend to be; and the more a milieu is placed to the right on the horizontal axis the more it tends to be open to post-material values and an individualistic outlook on life. This then applied to the particular field of internet access and attitudes towards the 'internet galaxy' provides us with the fowling milieu landscape for Germany as of 2012 [5, p.15]:

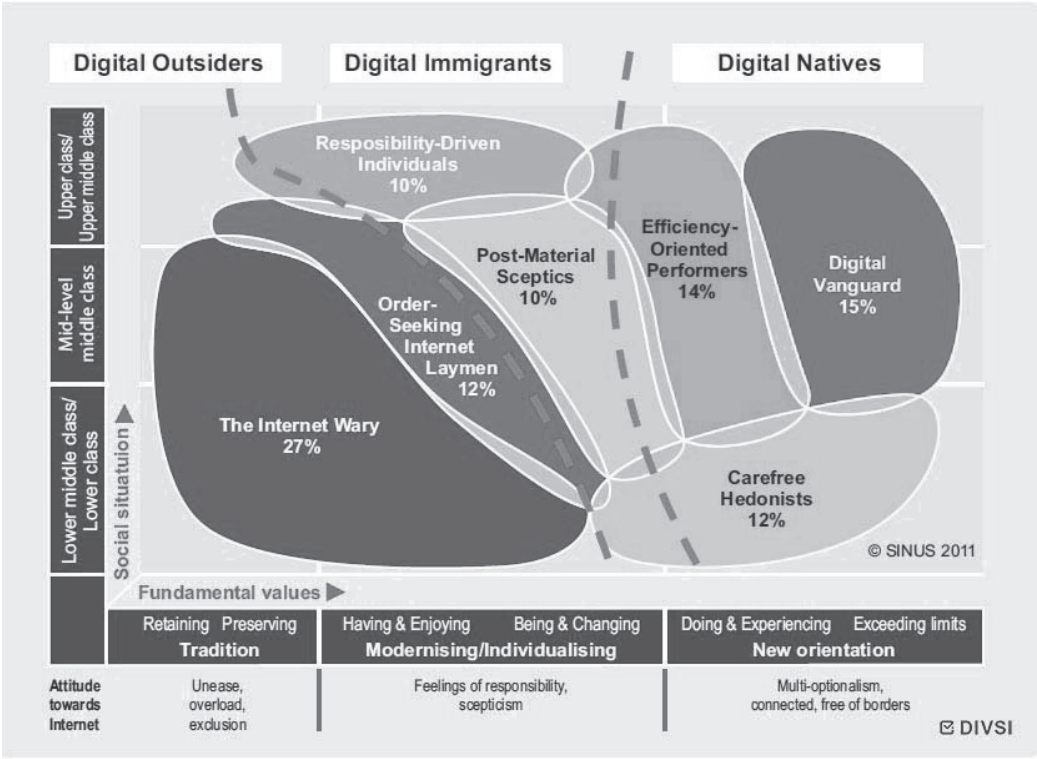

Figure 1

Accordingly, the following internet milieus can be identified, beginning with the web-affine milieus first (following 5, p. 20ff.]:

- Digital Vanguard (15% of German population or 10.3 Mio people)

  As suggested by its name, this milieu consist of the postmodern internet elite. Having grown up with it, the net is a natural part of their daily life, both private and professional. They are mostly young and well off. Accordingly, their attitude towards the net and its chances is most self-confident and playful, associated with more freedom, participation and democracy but also self-responsibility in terms of data protection. Due to their individualized life style and technical expertise, they fail to see that other milieus might feel less comfortable with the net.

- Efficiency-oriented Performers (14% / 10.0 Mio)

  Members of this milieu have the highest income level and the necessary overall intelligence to keep up with developments in society so they can benefit from them as quickly as possible. Accordingly, the internet use and attitude of this success driven milieu is less playful but utilitarian-pragmatic. The internet is approached with the best possible IT skills and equipment, so that they can feel in control here as elsewhere in life. The net for them is a source to make work easier and to simplify things, but also a source of risks. Accordingly, they look for a balance of freedom and security in their net life.

- Carefree Hedonists (12% / 8,7 Mio)

  This middle and lower class milieu of mostly young people relishes the easy access to the internet to which they bring a carefree attitude and self-belief that is not always founded on above average IT skills. It is possibly the milieu with the highest user intensity of social media, but at the same time largely confined to the realm of music and games. We can also find the least awareness of dangers and risks associated with the internet in this milieu. Accordingly, the distrust of institutions and regulations that characterizes their overall attitude to society is also prevalent in their net activity. Overall, it could be argued that theirs is an 'escapist' milieu.

- Post-material Skeptics (10% / 6.7 Mio)

  This politically aware and well-educated milieu extends its critical attitude towards a consumption and media driven society consequently also towards the internet. Just as much as they tend to have doubts about globalization and other technology driven processes, so they harbor doubts on internet security and fears about the manipulative potential of the net. Accordingly, despite having above average IT skills, they have developed a very selective attitude towards the 'internet galaxy', largely focused on information and communication options. Based on the conviction that it is up to the citizens (and not government regulations) to organize a secure and democratic web they place emphasis on improving the internet skills of individual users.

- Responsibility-driven Individuals (10% / 7.3 Mio)

  This milieu consist of professionally and financially very well established individuals with average IT skills. The internet they approach with the same systematic and (self)responsible attitude as they do in all other spheres of their successful lives. They are open to change but also demanding in terms of obvious benefit that a technical innovation has to provide in their eyes. They are self-confident enough not to simply follow the crowd when it comes to superficial use of technological gadgets. They are explorative with regard to information gathering online, but at the same time very aware of risks concerning their privacy. Here they do not trust their own skills but trust in professional assistance. Overall, they carry a certain reflexive respect for the complexity of the internet.

- Order-seeking Internet Laymen (12% / 8.2 Mio)

  Members of this milieu belong to the conventional mainstream of society. They provide the second oldest segment and recruit from the simple to mid-level social strata of German society. Their general desire for harmony and security combined with lack of confidence in their limited IT skills makes them avoiding the internet if they can, or to rely on help from others. Even though they can see a few advantages in the basic functions of the internet, this is overshadowed by security issues and overwhelming sense of mistrust. The overall attitude towards the net consequently is general avoidance and/or periodical abstinence.

- The Internet Wary (27% / 19.1 Mio)

  The internet world has largely passed by the oldest and most traditional segment of German society. Many within this milieu are indeed 'offliners', while others make occasional use of

> basic functions of the net, more often than not with the help of relatives. They have a diffuse awareness of the risks involved in using the internet and can see very little advantage that the net brings to their own lives. The net is largely associated with a feeling of helplessness and being overwhelmed, leading in turn to resignation and even resistance against it.

Two major observations can be made when relating this rather detailed account of internet access and internet use in German society back to the debate on social divide in digital society. The first one rejects the idea of the internet as a level playing field. Despite the overall tendency to close the so called 'digital gap', there were by 2012 still about 40%, or 27 out of 72 million people in absolute numbers, who amongst Germany's population tended to view themselves as 'digital outsiders'. While on the other end of the spectrum there is also a social segment forming that can be described as 'digital natives'. It comprises of mostly younger people who have grown up with the internet and see it as a natural part of their daily lives. To complete the picture, in the middle of this panoramic landscape of internet milieus there is a large segment of 'digital immigrants'. They use the internet on a regular basis but retain a sense of skepticism and a means to end approach [5, p.8f.]. Subsequently, it is not one gap but two boundaries that run through Germany's 'internet galaxy', as far as access and use of internet facilities generally is concerned (see graphic above). A most recent follow-up study of SINUS internet milieus has shown that this landscape has become more sophisticated but not more equal in its social patterning. On the one hand, the study observes a further, even if slow, closing of the 'digital gap'. The part of true 'offliners' amongst Germany's population has between 2012 and 2016 further decreased from 20% to 16%. On the other hand, the study claims a rapid differentiation of internet use and level of digitalization amongst the 'onliner' milieus. Thus, the study highlights as its major finding that despite a steady overall diffusion of the internet Germany's 'digital society is drifting apart further' [3, p.12]. The study also claims that the question of social in/equality within the internet galaxy has moved on from the rather simple 'if' (technological access) to more complex 'how' (varieties of usage) questions [3, p. 25]. This resonates with observations made previously and elsewhere, which have called for a second round of digital divide research with emphasis on use rather than access, referred to 'second-level digital divide' [15, p.22] or 'digital inequality' as opposed to 'digital divide' [10, p.4] respectively. Arguing for a more processual understanding of this development, N.Zillien [26] has suggested a three-phase model of digital divides research. While the first period was simply about technological access the second was driven by differentiation in internet use. The third and current phase however is concerned not so much with how socio-economic status affects internet access and usage, but instead focuses on how differences in internet use actually affects the social distribution of social resources such as information and social capital.

Secondly, however, it is important to recall a second major observation then, namely that these new social cleavages do not simply follow socio-economic status. Instead, they are structured by socio-cultural attitude towards the internet too. While for some it is access to information or professional efficiency, for others it is the promise of entertainment and self-promotion that drives them towards the internet. The SINUS milieu internet analysis provides us with a sense of the deep social embeddedness of online styles within the various milieus mentioned above, especially when it comes to content, intention and intensity of usage. In other words, simple talk of a 'digital divide' tends to neglect the impact that each user's social milieu has on the concrete pattern of internet use. It is the social habitus (the confidence in self-efficacy, attitude toward new technologies) and the social capital (the networks of friends, colleagues, neighbours and family) which provides the more or less enabling informal ways of accessing and using the internet (as opposed to the more formal conditioning factors of income and education level). In other words, we need nuanced empirical research with regard to how concrete social milieu 'translate… into concrete digital practices' (14,

p.3]. Moreover, the picture gets rather complex if we take into account that just as offline society the internet galaxy serves various 'social fields' such as culture, politics, arts, health, education…. [ib.]. In consequence, when looking at the concrete social structuration of 'the motivation and ability to use the internet in a capital-enhancing way' it might be more useful to refer to 'participation divide*s*' rather than a 'digital gap' [ib., p.1, my emphasis]. For example, based on the SINUS milieu studies it is argued that the effect of (old) age on internet use is to a certain extent offset by general media competency acquired when it comes to strategic information and political judgement. Likewise counter intuitive to digital gap research runs the observation that it is actually 'large parts of the high SES [socio-economic status] milieus… (that) opt out of participating online because of a lack of time or interest' [ib., p. 2, 8].

However, what further complicates the debate is the fact that despite increasing scientific attention 'digital participation' remains a widely used but diffusely understood concept. The studies mentioned above note in this respect that as yet there is no reliable set of indictors that would 'measure' digital participation [3, p.76]. Commentators have argued that 'digital participation' has turned into an ill-defined concept [Meckel in 4, p.4ff.]. There is a tendency to equate any active engagement on the net with participation in its more civic or political sense. Even the difference between active and passive engagement on the net is difficult to maintain amidst the complexity of online activities such as surfing, posting, chatting, downloading, lurking…. Accordingly, the borders between information and entertainment become blurred. Moreover, even within the field that could vaguely be described as political or civic, where does activism start and 'clicktivism' or 'slacktivism' end [ib., p.6]? In this context, it is then also maintained by several commentators that more research is necessary in order to differentiate between political information, political discussion, and political participation in the sense of (online) influence on political decision-making. One suggestion to get a better analytic differentiation between various forms of online engagement is to lean on the well-established 'ladder of participation' model with its different degrees of activism. Accordingly, a first step of online political engagement would be political information online, followed by political commenting and other modes of feedback (ratings, likes), finally culminating in providing own ideas and initiating interactive projects related to public affairs (campaigning) [4, p.13].

Against this admittedly shaky conceptual background it is then estimated that (by 2011) 70% of the German population does not politically engage on the internet, another 20% shows limited engagement (can be activated for single projects and issues), while only the remaining 10% can truly be considered as 'political activists'. The most common form of political engagement is online petitions (15% of respondents), followed by ballots on single topics (14%). To participate in political debate via social media is imaginable by 20% while another 18% is prepared to engage longer term in a political discussion group [4, p.21]. Looking at it from the SINUS Milieu perspective again, the panorama of political online participation can be sketched out as follows (cf. 14, p.4ff.]:

- Digital Vanguard

  Generally speaking 'political participation on the internet is not common in this milieu' [ib., p.4]. If at all then social media are used for 'critical consumption'. Mostly this technologically up to date milieu participates online in educational, educational and cultural affairs, some of which perfectly relate to their offline avant-gardist life style (Couchsurfing).

- Efficiency-oriented Performers

  This generally internet-oriented milieu is considered to 'refrain from political participation on the Internet' [ib., p.5]. Due to the overall entrepreneurial spirit of its life style, internet use is purpose- and consumption-driven. There is less motivation to engage for civic purposes.

- Carefree Hedonists

  This self-centered internet milieu uses the internet for clique related consumption and entertainment (gaming, shopping). Accordingly, interactive auction platforms such as eBay are popular. Overall, members of this milieu 'tend not to participate for political purposes on the Internet' [ib., p.5]. If at all there should surfaces a political or civic purpose in the online activities of this milieu, it would be for non-traditional topics (animal rights).

- Responsibility-driven Individuals

  In line with the down to earth attitude of its lifestyle, in this milieu 'offline participation is more prevalent than online participation' [ib., p.6]. They participate rather infrequently online, but if so then in a wide range of issues and topics, as long as there might be an effect on the 'real world'.

- Post-material Skeptics

  This well-educated milieu has a positive attitude towards political participation in general but harbours a reflexive skepticism towards the internet at the same time, especially its commercial implications. Accordingly, those members of this milieu 'who participate online often do so for political and civic purposes, especially for ecological and social causes' [ib. p.6].

- Order-seeking Internet Laymen

  As digital outsiders they tend to be restraint in internet use, not to speak of participatory internet activities of political intent. If they overcome the technological hurdle, member tend to participate occasionally in the fields of culture and health. Overall, members of this milieu 'see active online participation as less real and valuable than participation outside of the internet' [ib., p.7].

- The Internet Wary

  Due to significant influence of (old) age and social background (working class), 'there is a desire for participation, which cannot be realized due to the lack of familiarity with the internet' [ib., p.8]. If at all, there is passive use of the internet mostly in the areas of hobbies and health.

We can summarize this panoramic view on German internet society with the observation that contrary to scientific attention and interest, political online participation is less prominent in most milieus than expected, given the steady technological closing of the 'digital gap' [cf. 14., p.9]. Obviously, there is no automatism between access *to* and (political) participation *in* digital society. Would it be overdrawn to conclude this first section by claiming that at least for Germany the idea,

which is shared by transparency activists, namely that the combination of internet technology and lowered barriers to publicly relevant data would spur renewal of democracy in general and civic activism in particular, stands on empirically weak grounds? The following second part now attempts to investigate the 'transparency norm' from a conceptual perspective.

3. 'Voice Divide' and the return of the 'Well-Informed Citizen'?

Undoubtedly, the internet has the democratic potential to enhance poly-perspectivity, reflexivity and social connectivity [10, p.2]. However, quite a few analytic commentators on internet democracy argue that in practice the net seems to contribute towards ambivalent if not outright contrary tendencies. They describe 'fragmented publics' which each resemble a closed 'media-biotope' more than an arena of deliberating exchange. They account for a lowered threshold of 'public opinionating' that is closer to self-promotion than enlightened argument [4, p. 8ff.]. They observe 'personalized publics' that are shaped by largely self-referential 'feeds' and 'streams', follow personal rather than societal relevancies, and consequently gather like-minded followers rather than engaging in conversation with opposing arguments [22, p. 3ff.]. A largely privatized internet thus, despite ubiquitous access to information, has just as well the potential to provide tailor-made 'filter bubbles' and 'echo chambers'. Which might be ok as long as it is about information and decision making in the sphere of consumption, but rather detrimental when it comes to the sphere of politics and political information. Here the technologically supported combination of evasion of contradictory information and argument on the one hand, and of attracting like-mindedness on the other, might indeed result in a 'spiral of silence 2.0' rather than promote compromise and change of mind based on good arguments [16, p. 35]. In addition, we have to remember that the internet is an infrastructure provided by private software companies for debate in various largely unrelated publics, but not a public infrastructure per se [22, p. 8]. Finally, if we recall from the SINUS milieu internet study that online participation by and large follows the milieu structure in the offline world, then it seems no exaggeration to argue that the *e* in 'e.democracy' also stands for *e*xclusive and not just *e*lectronic [cf. 18, p. 16].

The popular idea that internet led transparency of government data will restore democracy and civic engagement thus seems at least shortsighted and 'rests on several problematic assumptions, primarily the presupposition that "if only people knew" things would be different' [12, p. 4]. To start with, information needs interpretation and transparent decision-making does not necessarily equal good policy. In fact, what many transparency enthusiasts tend to forget: information needs to be processed into knowledge, which in turn needs to be transferred into political judgement [1, p. 406]. Consequently, it still holds true that the vitality of democracy depends on the quality of democratic debate [21, p. 31]. Some commentators have argued that one such indicator of quality of democratic debate is the social distribution of 'voice'. Initially this question seems to continue the classic digital divide debate: whose voice will be heard on the internet, and will the voice of the so far marginalized find more resonance on the internet? It also indicates the ambivalence of internet democracy: the flip side to generally lowered entry barriers for debate via the net is a highly competitive 'attention economy' on the net that in last consequence seems to favour those voices that can rely on professionalized 'spin' [21]. However, eventually those commentators pushing the question concerning 'voice' get at the core of internet democracy: the quality of debate. Drawing on A.O.Hirschman's classic model of 'Exit, Voice and Loyalty' [9] they argue that there is a tendency to participate online in the mode of political consumption. Let's have a closer look at Hirschman's model to better understand their claim. On the surface of it, 'exit' and 'voice' simply stand for two opposite ways of dealing with the deteriorating performance of institutions. 'Exit' is the act of leaving the institution for somewhere else where there is better service on offer, while 'voice'

implies complaining with the intention of restoring or even improving the quality of the institution at hand. But it has to be noticed that while 'exit' is a largely private decision, 'voice' requires long term commitment, and sustained interaction with others. Thus 'politics of voice' stands for political reform that is driven and inspired by 'feeling a part of that society' [12, p.10]. Moreover, debates and politics inspired by an attitude of 'voice' require that apart from criticism there has to be voiced an alternative vision of how the institution / society should develop by exactly those who criticize it [10, p. 9]. In other words, 'politics of voice' require debate on 'inner alternatives' instead of 'outer choices'. Just as much as transparency we need different visions of 'good society' in democratic debate. However, what some of the more internet-critical commentators observe instead is 'that citizens react to the failures of democracy in a way similar to how they react when disappointed with the market' [12, p. 10]. Depersonalized interaction, fragmented attention and superficial transparency in combination carry the potential for a distorted vision of democracy which confuses opacity with publicity, the (loudest) 'crowd' (volonté de tous) with the sovereign people (volonté general), and opinionating with mediation and compromise. Consequently, those critics argue, what we need is perhaps not so much a debate on 'digital divide', which inevitably leans towards technological issues of online participation, but a debate on 'voice inequality', if by the we mean the different democratic potential of the various publics that constitute e.democracy [cf. 10, p.14].

A crucial aspect of this democratic potential is the readiness and capacity to engage with the complexity of politics and policies. Here too one could start the analysis with the truism that too much information means opacity rather than clarity. On the one hand, this applies even more so in a society that, at least in its self-perception, is exponentially growing in complexity. It is commonly assumed, that politics and administration are facing an increasing complexity of the social environment, indicated by the task of multi-level governance at all levels of politics, risky feedback loops of potentially global dimension even at local level, and pressurized decision-making for those in charge [11]. 'Open government' could thus be seen as a way of dealing with this complexity in so far as its main aim is not the procurement of legitimacy but the tapping of relevant knowledge, circulating in the everyday life of ordinary citizens [8, p. 42]. On the other hand, politics and policy-making always has been a more complex process than the normative call for more transparency of data and government procedures might suggest. As has been argued, even the most trivial mode of communal politics is not just about facts and figures but also about the authoritative judgement on values, and in consequence about generating winners and losers in (local) society. Moreover, politics and policies with some strategic ambition are always about the future, or at least unfold their potential in the future, and therefore they can hardly be measured against the facts available in the here and now [1, p. 405, 411f.]. From inside the discourse of government and administration it is thus plausibly maintained, that a simple call for more transparency misses the point insofar as it tends to generate information overload, and largely blanks out the complexity of policy issues [25, p. 7]. To help people to transfer information into political judgement, political and social framing are just as necessary as the ready disclosure of facts and figures. Instead of more information there is perhaps more need to fill the 'explanatory void' left by a mode of politics which is too much concerned with formal transparency norms but does not appreciate enough the importance of normative guidance and vision in complex society [11, p. 23]. To elaborate on this point, it could be argued that what we need is a better understanding of the link between transparency and trust in complex society. It is a basic feature of modern society that its life-world as a whole is neither fully understood nor fully understandable by anyone be they lay people or experts in some field or other. A crucial feature of 'ontological security' therefore is trust in other people (fellow citizens, politicians) in general and 'abstract systems' (institutions, expert systems) in particular in most areas of life [7, p. 36ff.]. It is the paradox of late modern society that its increasing complexity demands more trust rather than ever more information. Our contemporary debates on the

management of mistrust in democracy and politics seen from this perspective indicate a loss of ontological security in late modern society more than a loss of trust in democracy. Control of facts concerning good governance and the conduct of political representatives, is at best a substitute for trust, and an emotional valve in dealing with the loss of ontological security, but will not generate more trust in either democracy or a complex global society [12, p. 4; 1, p. 413].

Such a situation needs citizens that regard themselves not primarily as customers in the realm of politics but have the confidence to take decisions in terms of aligning with political programs, based on both information and moral judgement. In other words, it needs people who are able to participate in public debate not on the base of control of and mistrust in politics, but trust in their own moral competence due to mastery of everyday life. Debates that focus on the disclosure of government information, and thereby turn the citizen into some sort of political or scientific quasi-expert, tend to neglect this moral competency [12, p. 5]. An ideal type of that sort is provided by Alfred Schütz' classic 'The Well-Informed Citizen' [23]. Schütz distinguishes the 'well-informed citizen' from both, the 'man on the street' (or lay person) and from the 'expert' alike. While the latter is caught up in a monopolistic system of expertise, the former is driven by sentiment. It is the well-informed citizen's responsibility to emancipate from both and to redirect and reinterpret the relevances imposed by each of them. In the end 'it is the well-informed citizen who considers himself perfectly qualified to decide who is a competent expert and even to make up his mind after having listened to opposing expert opinions' (ib., p. 123]. But on what grounds and to what extent would he be inclined to follow someone else's opinion? Here Schütz offers another useful distinction concerning the social distribution of knowledge that could help us in our analysis of the transparency norm. He differentiates between 'socially derived knowledge' and 'socially approved knowledge'. The first mode of knowledge acknowledges that most of what we know is not personally acquired, but passed on and handed down by others. The second mode however is based on the crucial observation that 'any knowledge… receives additional weight if it is accepted not only by ourselves but by other members of our peer group' [ib., p. 133]. Not surprisingly then, 'socially approved knowledge is the source of prestige and authority; it is also the home of public opinion'. What is remarkable in the light of today's development is Schütz' insight that in the age of opinion polls it is the opinion of the 'man on the street' that 'becomes more and more socially approved at the expense of informed opinion'. Schütz concludes: 'It is the duty and the privilege, therefore, of the well-informed citizen in a democratic society to make his private opinion prevail over the public opinion of the man on the street' [ib., p. 134]. In this courageous pleading for the well-informed citizen, Schütz indicates already its counterpart too, namely someone sensitized to and driven by public opinion rather than his own morals. American sociologist David Riesman has given this character a most emblematic portrait in his figure of the 'inside-dopester' [17, p. 210ff.]. He describes this counter figure to the well-informed citizen as 'other-directed', keen to win other people's approval, keen to know the inside story to any topic and to belong to the inner circle 'for whatever peer group satisfaction this can bring'. He or she is politically competent in so far as 'living in a politically saturated milieu, (demands that) he knows the political score as he must know the score in other fields of entertainment, such as sports'. It remains to be seen which of these two social figures shall prevail in e.democracy.

4. Reclaiming conversation - and yet another alternative Democracy?

It is a recurrent observation in research on 'open government' and digital participation that more transparency actually has led to more rather than less resentment towards politics and government. Often this argument is illustrated with reference to Obamas White House initiative on 'Transparency and Open Government' and the detrimental effect this has had. Critics argue that it

has made transparency a global norm of democracy without really inducing a new trend of democratization of government [1, p. 399]. Following this observation, some commentators have concluded, that it needs indeed a 'change of culture' in terms of thinking about transparency, in fact not just in the way of handling government data but in the art of 'good governance' [18, p. 18]. They have subsequently tied this observation to the claim that what we need is another mode of communication than the one structured around followers and likes, namely 'conversation' [22, p. 4]. If we take that approach seriously, we might recognize that calls for more transparency could go to the core of what is perceived as a 'far reaching socio-cultural change' [ib.]. Rightly understood this social transformation referred to, is not confined to the political system of representative democracy but concerns society as a whole. American social psychologist Sherry Turkle has most recently enlivened this cultural debate by stating the urgent need for 'reclaiming conversation' [cf. 13]. She argues that 'we are being silenced by our (digital) technologies'. Driven by self-presentation and instant feed-back, they have made us unlearn 'conversation', understood as mode of communication based on undivided and open-ended attention, self-reflection, empathy and mentorship for the other. To reclaim conversation therefore is to reclaim fundamental human values, according to Turkle [ib.].

French social historian Pierre Rosanvallon [cf. 6] has adopted a similar approach to democracy theory, without the luddite-like subtext that one can find in Turkle's argument. For him the most fundamental reason for implementing what he calls a 'narrative democracy' does not lie in technology but the very design of representative democracy. Instead, according to Rosanvallon, it is to be found in the irresolvable incongruence between the 'concrete people' and the 'abstract sovereign', or the people and its polity for that matter. The concrete people will always feel at least in parts misrepresented in the abstract body of the sovereign, elected by majority [cf. 19, p. 21ff.]. However, Rosanvallon maintains, that this fundamental problem of any representative democracy has intensified due to recent developments in modern society. Modernity, in his view, has moved from an 'individualism of universality' (universal human rights and standardized life style) to an 'individualism of singularity' (unique biographical patterns of life-style and social inequality) [ib., p. 28f.]. Notions like 'deficit of representativeness' and 'transparency' get a much wider meaning and importance when looked at from this perspective. Because it is not a crisis of democracy as a political system but a crisis of democracy as a form of society that Rosanvallon points us to [ib. 34]. Consequently, the project of 'narrative democracy' is not primarily about better communication between the people and its political representatives. It is about no more and no less than the 'deciphering of society' as a whole. A society that has become opaque to itself due to superficial 'mediatization' and distorted notions of 'transparency' [ib., p. 19, 36]. The deciphering of society via a joint narrative of a cacophony of different voices Rosanvallon calls 'the parliament of the invisible'. To put this democratic project into practice, he calls on a long tradition of narrative writing committed to the invisible of society, ranging from Charles Booth's 'London Labour and the London Poor' (1989/91) to the 'Federal Writers Project' (1935) as part of the New Deal under F.D.Roosevelt, and on to St. Turkel's 'Working: People Talk About What They Do All Day and How They Feel About What They Do' (1972). However, to do justice to the new 'individualism of singularity' there should be no hierarchy of genres and styles, he argues. Consequently, Rosanvallon puts trust in the 'democratic virtuality of the internet' in order to get as many people as possible to be their own representatives. His own project www.raconterlavie.fr he regards as a small piece in an unfolding panorama [ib., p.64f.]. Others can be found at www.leisestimmen.org.

5. Summary

What we encounter in a network society where the majority of bottom-up initiatives on the internet are counted under transparency and/or participation initiatives, such as e.g. www.abgeordnetenwatch.de [18, p.17] is often celebrated as a revitalization of democracy. The chapter aimed at taking a critical look at this view. Both from an empirical standpoint and from a conceptual perspective we found reasons to be hesitant towards a full embrace of what amounts to a politically correct transparency norm. This sceptical view is shared by others who have referred to ‚transparency-actionism' [1, p. 398], 'transparency-illusion' [25, p. 15] or ‚transparency-delusion' [12, p. 1] respectively. However, while agreeing with their analysis, the best fitting term for the phenomena described might still be 'transparency-fetishism'. Leaning on Marx' notion of 'commodity fetishism', what the terms intends to describe is an illusion generated by contemporary internet based transparency initiatives. It suggests that the political norm of 'transparency' in the sense of disclosure of government activity and government data masks the need for another holistic understanding and practice of 'transparency', namely the deciphering of contemporary society in a 'narrative democracy', both on- and offline.

6. References

[1] BAUMANN, M-O.: Die schöne Transparenz-Norm und das Biest des Politischen: paradoxe Folgen einer neuen Ideologie der Öffentlichkeit, in: Leviathan Bd. 42(3), 2014.

[2] CASTELLS, M.: The Internet Galaxy: Reflections on the Internet, Business, and Society, Cambridge, 2001.

[3] DIVSI (Deutsches Institut für Vertrauen und Sicherheit im Internet), DIVSI Internet-Milieus 2016: die digitalisierte Gesellschaft in Bewegung, Hamburg, 2016.

[4] DIVSI (Deutsches Institut für Vertrauen und Sicherheit im Internet), DIVSI Studie zu Bereichen und Formen der Beteiligung im Internet, Hamburg, 2014.

[5] DIVSI (Deutsches Institut für Vertrauen und Sicherheit im Internet), DIVSI Milieu Study on Trust and Security on the Internet: Condensed Version, Hamburg, 2012.

[6] DORMAL, M.: Über Rosvallon, Pierre: Le Bon Governement, Paris, 2015, in: H-Soz-Kult 11.08.2016.

[7] GIDDENS, A.: Modernity and Self-Identity: Self and Society in Late Modern Age, Cambridge, 1993.

[8] HERZBERG, J.: Open Government – Versuch einer Begriffsbestimmung, in: Verwaltung und Management Bd. 19(1), 2013.

[9] HIRSCHMAN, A.O.: Exit, Voice and Loyalty: Responses to Decline in Firms, Organizations, and States, Cambridge MA, 1970.

[10] ISKE, S., KLEIN, A. and KUTSCHER, N.: Nutzungsdifferenzen als Indikator für soziale Ungleichheit im Netz, in: kommunikation @ gesellschaft 5, 2004, URN, http://nbn-resolving.de/urn:nbn:de:0228-200405015

[11] KORTE, K-R.: Beschleunigte Demokratie: Entscheidungsstress als Regelfall, in: Aus Politik und Zeitgeschichte. Bd. 62(7), 2012.

[12] KRASTEV, I.: The Transparency Delusion, in: Eurozine, 2013, http://www.eurozine.com /the-transparency-delusion/

[13] LOZADA, C.: Review of Reclaiming Conversation: the Power of Talk in a Digital Age by Sherry Turkle, in: Washington Post, 1 October, 2015, https://www.washingtonpost.com/ news/book-party/wp/2015/10/01/

[14] LUTZ, C.: A Social Milieu Approach to the Online Participation Divides in Germany, in: social media + society Bd. 2(1), 2016.

[15] MARR, M.: Soziale Differenzen im Zugang und in der Nutzung des Internet: Aktuelle Befunde aus der Schweiz, in: Medienheft Dossier 19, 2003, http://www.medienheft.ch /dossier/ bibliothek/d19_MarrMirko.html

[16] MECKEL, M.: Menschen und Maschinen: wenn Unterschiede unsichtbar werden, in: Aus Politik und Zeitgeschichte. Bd. 62(7), 2012.

[17] RIESMAN, D.: The Lonely Crowd: A Study of the Changing American Character, New York, 1953.

[18] ROLEFF, D.: Digitale Politik und Partizipation: Möglichkeiten und Grenzen, in: Aus Politik und Zeitgeschichte. Bd. 62(7), 2012.

[19] ROSANVALLON, P.: Das Parlament der Unsichtbaren, Wien, 2015.

[21] SCHIFFER, S.: Informationsmedien in der Postdemokratie, in: Aus Politik und Zeitgeschichte. Bd. 62(7), 2012.

[22] SCHMIDT, J-H.: Das demokratische Netz?, in: Aus Politik und Zeitgeschichte. Bd. 61(1/2), 2011.

[23] SCHÜTZ, A.: The Well-Informed Citizen: an essay on the social distribution of knowledge, in: Collected Papers Bd.II, The Hague, 1971.

[24] UNIVERSITY OF MISSOURI-COLUMBIA, Internet accessibility an important factor in government transparency: study finds population demographics play important role in transparency levels, in: ScienceDaily, 3 August, 2015, www.sciencedaily.com/releases/ 2015/08/150803155324.htm.

[25] WEWER, G.: Allheilmittel Transparenz? Anmerkungen zur Diskussion, in: Verwaltung und Management Bd. 20(1), 2014.

[26] ZILLIEN, N.: Internet verstärkt soziale Spaltung, Deutschlandfunk, http://diskurs.dradio.de/2 012/04/12/das-wissen-und-das-netz-wer-hat-dem-wird-gegeben/

eGovernment I

E-GOVERNMENT SERVICES IN MOLDOVA: VALUE AND OPPORTUNITIES

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Abstract
Technological progress in ICT has created conditions for a new government paradigm - from a government that leads to a government providing services to society. Technology changes the nature of the connection between government and citizens: governance becomes more participatory and citizens' interests prevail.

The impact of e-Government solutions is complex, on multiple levels, depending on the maturity of the models applied and the capacity of citizens and business to assimilate e-Government services. In a short time, electronic government services in Moldova have evolved from simple information services to integrated transactional services.

On the one hand, this is due to high performance telecommunications infrastructure (broadband, 2G, 3G and 4G technology) and, on the other hand, to citizens' expectations that boosted recently and determined the government to accelerate the implementation of new e-services, increasingly complex and a better quality.

The paper addresses the issue of e-Government services in terms of the value that it gives to the government and to citizens' lives and analyzes opportunities to develop e-Government services in the new technological and social realities.

1. Introduction

The achievements in the information technology and communications have significantly changed the communication process between the government, citizens and business. This has created opportunities for developing new types of relationships in the governance process that have positively impacted the efficiency and effectiveness of the governance act.

The wide access to Internet changed the way government provides services to citizens. Today governments are making efforts to accelerate the development of more complex e-Government services not only to ensure better quality services but also to improve the efficiency and effectiveness of the government and render its activities more transparent [7].

The aim of the electronic services is to provide faster public services of better quality and with an as low as possible administrative burden. Effectiveness of government providing the service must increase with the development of electronic services. [12].

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The interest in e-Government in Moldova has significantly increased along with the creation of the Centre for e-Government in May 2010 and the adoption of an ambitious strategic program of technological modernization of governance (e-Transformation) in 2011 [13].

The program has set the following objectives:

- Implementation of transparent, efficient and responsive governance;
- Modernization of the public services through digitization and re-engineering processes;
- Improvement of governance by ensuring the interoperability of IT systems, consolidation and reuse of resources.

Achieving these goals requires a comprehensive and deeper approach to the re-technologisation of governance, streamlined business processes that ensure government activities and the implementation of new models of public services.

This study aims at examining the most important achievements in electronic services that occurred in Moldova in the recent years, analyzing the impact these services have on people's life and work , as well as at identifying opportunities for the further development of e-Government.

2. e-Government in Moldova - initiatives and achievements

The implementation of electronic services is possible if there are sufficient premises [2]. In Moldova there are sufficient of such premises. Moldova has a well-developed network of electronic communications. Fixed telephony provides broadband rate of 14.7%, while mobile - 49.4%. Fixed telephony has a penetration rate of 35.2%, while the penetration rate of the mobile telephony is 108%.Fixed broadband Internet is used by 14.7% of the population, whereas 46.6% use mobile broadband internet.

Rank	Country	EGDI	EGDI Level	OSI	TII	HCI	Level of Income
35	Russian Fed.	0,7215	High	0,7319	0,6091	0,8234	High Income
36	Poland	0,7211	High	0,7029	0,5857	0,8747	High Income
46	Hungary	0,6745		0,6304	0,5615	0,8317	Upper Middle Income
49	Belarus	0,6625		0,4855	0,6304	0,8716	Upper Middle Income
50	Czech Republic	0,6454		0,4783	0,5952	0,8627	High Income
52	Bulgaria	0,6376		0,5652	0,5602	0,7875	Upper Middle Income
62	Ukraine	0,6076		0,5870	0,3968	0,8390	Lower Middle Income
65	**Moldova**	**0,5994**	**High**	**0,5942**	**0,4850**	**0,7191**	**Lower Middle Income**
67	Slovakia	0,5915		0,4420	0,5504	0,7822	High Income
75	Romania	0,5611		0,4565	0,4533	0,7736	Upper Middle Income
	Eastern Europe	*0,6422*		*0,5674*	*0,5428*	*0,8166*	
	Europe	*0,7241*		*0,6926*	*0,6438*	*0,6897*	

Table 1: E-Government Development Index in Eastern Europe countries, 2016 [15]

Moldova has a high level of e-Government Development Index, with ratios between 0.50 and 0.75 (*Table 1*). Also, it is one of the few countries with lower middle income that made it to the top 50 countries, of which 26 are European countries that have the largest e-participation index (0.6610), with high levels of OSI - between 0.50 and 0.75 (*Figure 1*).

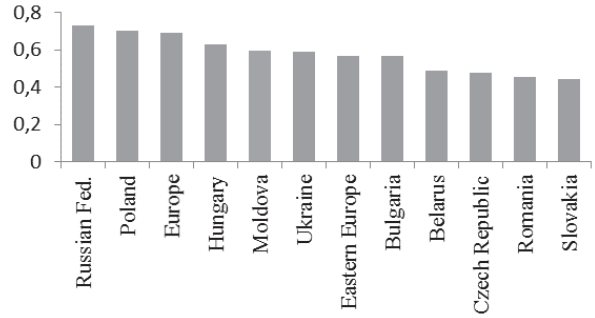

Figure 1: Online Service Index in Eastern Europe

E-Government Development Index - EGDI (UN surveys) is growing on the Online Service component – OSI, and Telecomm Infrastructure component - TII. Component Human Capital – HCI has not progressed during recent years and even declined (*Figure 2*) [14], [15].

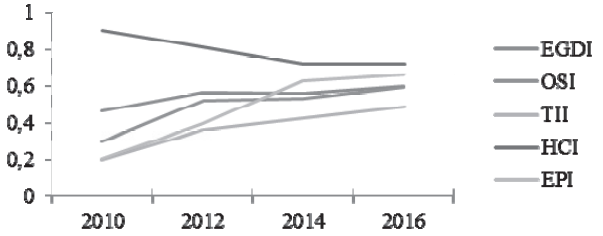

Figure 2: E-Government Development Indexes in Moldova

The successful implementation of public electronic services depends greatly on citizens' perception of how public services are provided. The usefulness, ease and ability to use electronic services and people's trust in open and responsible governance are important conditions for the adoption and development of the e-Government [10], [11], [12].

As the program of technological modernization of the government [13] was launched, consultations on the implementation of e-Services initiatives were conducted with relevant social actors, public officials, business representatives and civil society. Next on, the consultations focused on the delimitation of more required services, taking into account citizens' priorities and conditions of feasibility and sustainability of new services.

As at December 2016, 567 services were registered on the portal of public services, *servicii.gov.md*, of which 126 were being provided electronically. Among the most popular services are:

- Issuance of criminal record,
- Access to data from real estate register,
- Licensing of road transport,
- Checking personal data,
- Checking data on legal entities,
- ID card issuance,
- Issuance of birth certificate,
- Passport issuance,
- Issuance of information from the state archive,
- Licensing of construction activities.

Surveys on the perception of e-Government and electronic public services (http://www.egov.md/ro/resources/polls) show a significant increase in citizens' interest in the electronic governance model (*Figure 3*).

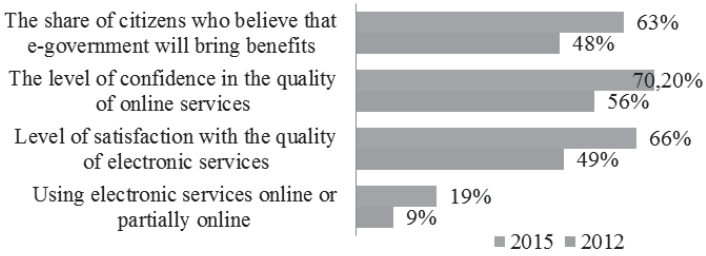

Figure 3: Accessing public services online or partially online

The number of citizens using electronic services increased, and the satisfaction level of individuals and businesses benefitting from such services increased as well, as they had a positive impact on the quality of their life and work. This is due to the fact that people use increasingly more computers and mobile devices, which leads to a higher degree of connection to Internet (*Figure 4*).

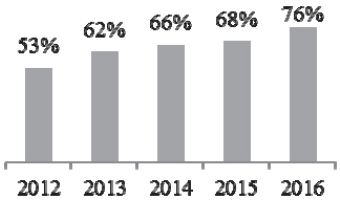

Figure 4: Level of connection of households to the Internet

The social impact is different for different categories of citizens. It depends on age, education level, income level, place of residence, urban-rural, etc. It is certain, however, that the impact is positive, with a clear upward trend. The growing number of users of e-services, and the desire and willingness to adopt and use new services are eloquent proofs of this.

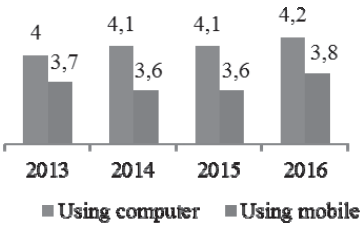

Figure 5: Willingness to use online services (1 - unwilling, 6 - want very much)

Service	**Release Date**	**Indicators in December 2016**
Open Data Platform (*date.gov.md*)	April 2011	937 datasets, 48 public authorities, 241 425 unique visitors, 334 178 visits per portal, 2 333 685 sets of data downloaded.
Portal *servicii.gov.md*	May 2012	566 information services, 125 interactive services, 556 services available, 658 231 unique visitors, 1 070 262 visits per portal.
Registry of personal data operators	August 2012	877 registered public institutions, 1 808 public information systems
e-Application for criminal record	September 2012	607 842 requests, 97.47% opted for the solution online, The rate of uptake of the service has reached 99, 15% in 2016.
Mobile digital signature	September 2012	89 465 users of mobile digital signature, 2 662 577 transactions.
e-Application for business license	November 2012	25 078 requests for license, 79.31% requests online, The share of online applications has reached 100% in 2016.
e-Normative documents in construction	January 2013	129 486 downloads data.
e-Reporting to the National Social Insurance House	February 2013	746 907 (96.27%) online reports, 61.50% - digitally signed.
e-Reports for National Health Insurance Company	July 2013	42 602 reports, 152 669 people registered.
Mpay - government electronic payment service	September 2013	3 471 039 transaction, More than 50 services connected to Mpay, 33 public authorities and operators of payments connected to Mpay.
e-Invoice	February 2014	4 454 businesses connected to e-invoice, 2 697 067 invoices generated.
e-Civil Status	December 2013	11 988 certificates issued, 2 266 (19.0%) of which are required online.
Mcloud - Government Cloud	February 2013	38 government agencies have migrated their systems to Mcloud
Mpass - authentication for governmental electronic services	December 2014	39 information systems integrated

Table 2: Indicators of online public services for June 2016

Citizens who frequently interact with the government are usually employees who have a higher education degree, higher income, and use computers and the Internet more frequently. These people are also more receptive to electronic services (*Figure 5*).

Performance indicators of the most relevant electronic public services are shown in *Table 2*. We have to mention that some services reached a rate of almost total assimilation, particularly transaction-related services.

The mobile signature is one of the successful solutions, which is the result of a public-private partnership. Mobile signatures provided by mobile operators are used by the tax inspectorate services, civil service, health insurance services, social insurance, licensing services, services of the Ministry of Justice and others.

Public sector computerization initiatives raised the issue for researchers to identify factors influencing the adoption of the e-Government. According to [10] these factors include: service benefits, management, costs, ease of use, trust, utility and other.

Public online services are perceived as e-Services that can save time, be accessed from anywhere and at any time, help save money and ensure free access to information. According to polls, most important advantages / benefits that electronic services provide are as follows (*Figure 6*):

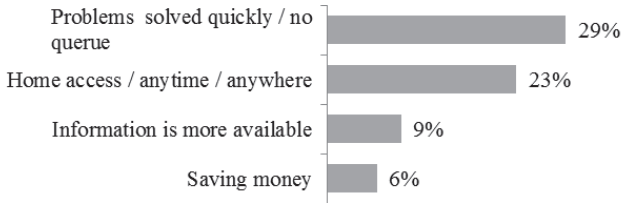

Figure 6: The main advantages / benefits of e-Government, % of respondents

There are multiple benefits of e-Government services in Moldova. Firstly, they assigned to another level of service culture that are based on social equity, attitude towards citizen, service quality, including availability - anytime, anywhere. Studies on the e-Government implementation [6], [7], [9], [11] showed that acceptance of electronic services by people, especially in developing countries, depends on the ability to overcome certain obstacles: cultural, religious, gender, etc. Such impediments exist in Moldova too [1], [8], especially among older people or those with a lower education level. However, statistics regarding the use of electronic services show that a significant part of the population has adapted quickly enough to the new public services and is aware of their usefulness and expediency.

At the initial stage of implementing the e-Government services we still cannot talk about significant financial benefits [7]. It requires more time for citizens to adapt to the new public services, and also to recover the investment made in e-Government services. According to our estimations, the implementation of criminal record service, for example, has generated benefits amounting to about 32 million MDL during the period under review. The calculations were made on values of time below the average that citizen uses to obtain this service traditionally, reported to the contribution to GDP [7], and transportation costs for obtaining such service. This amount exceeds the total investment chapter Shared Infrastructure and e-Services Development in e-Transformation program governance, carried out during the implementation of this service - about 26 million MDL [4].

3. Local e-Government between wishes and possibilities

Local authorities, mainly in the rural areas, face difficulties in the implementation of the e-Government. 57 percent of people live in rural areas in Moldova, according to statistics. Yet, the local administrative units mostly lack capacities of implementing independently high-performance electronic services [1]. Local officials are willing to implement electronic services, but they do not have the means needed to carry out such projects.

Nevertheless, residents of rural areas have a great potential to uptake electronic services. Thus, in 2016, 59% of rural people used Internet compared to 79% in urban areas and 92% in Chisinau [8]. 32% of the rural population accessed websites of government institutions compared to 39% in urban areas 66% in Chisinau.

It is worth mentioning that individuals and businesses interact most often with the government at the local level. Therefore, finding solutions for e-government at the local level is an issue of utmost importance.

Most frequently people from rural areas ask for the issuance of:

- Certificates on family composition,
- Certificates from work,
- Certificates on lack of debts to the local budget,
- Certificates on farmland property or lack of it,
- Notary Certificates,
- Certificates for pernancy of assets, property titles.

One of the main reasons that disturb most citizens when interacting with the local government bodies is the lack of access to different channels, long queues, and work schedule of the local authorities. Citizens find it difficult to adjust to the fact that there is a timetable for issuing certificates.

Providing more complex services that require information and approvals from various government agencies takes more time, such as, for example, issuing the permission for clearing green areas of local interest or permission of compliance of construction / maintenance of roads and local public roads.

In our view, to foster the implementation of e-governance at local level, it will be rationally to adopt a generic solution that can be used by a greater number of local authorities, such as the Local Documents Registry.

The *actelocale.md* portal offers:

- A registry of all local authorities regardless of their level,
- Modular solution that adjusts to the requirements of any Local Public Administration (LPA),
- Web pages for each participant of the Registry,
- Structured information in accordance with the activities of all LPA,
- Instant access to information,
- Collaboration and practice exchange between different geographic LPA areas,
- Central data base for all documents issued by LPA in Moldova.

4. Challenges and opportunities

Electronic public services have become a strong presence in the lives of citizens, in social work and business. The level of support and confidence in the quality and safety of online public services and willingness to recommend them is increasing from year to year. The survey [1] shows that 70% of people want to use public services online via computer and 63 % via mobile phones. Young and middle-aged employed people, having a better education and an income above the national average, are most receptive to new technologies in public services.

However, there are some signs indicating that a more complex approach is needed for proper development of the e-Government. For example, over the past 3 years, people's confidence that quality of e-Government services will meet their expectations has not increased (*Figure 7*).

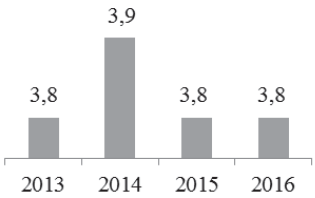

Figure 7: Reliability that e-Government services quality will meet expectations [7]

Also, the number of citizens believing that the e-Government creates benefits also remained unchanged in 2014 – 2016 (*Figure 8*).

There are several explanations for this situation. One of them is that the level of people's expectation as regards the benefits of the e-Government services increases as the phenomenon of e-Governance is better understood. The government should adopt and implement more aggressive policies to implement and promote the e-Government model.

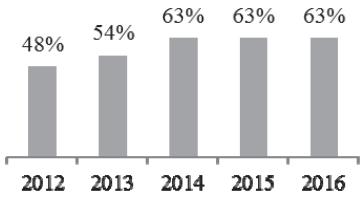

Figure 8: People's opinion on advantages / benefits of e-governance

On the other hand, the content of electronic services and their delivery in Moldova indicates that, at the moment, they are mainly departmental services with a low level of interoperability. Mostly, these are service requests for services.

The changes made so far referred mainly to technical aspects related to requesting or providing online services. The implementation of electronic services has not yet generated crucial structural change of the governance, often pertaining to the specific agency, ministry or public administration which is responsible for these services.

For example, you can apply online to obtain a criminal record. But you will need to take this document from the agency that issued it and then submit it to the institution that requested it.
The maturity of service models is still hovering low level. There are a number of interactive services, and some transactional services initiatives. The service integration phase will be achieved with the implementation of advanced models for interoperability. These activities are provided for in a number of strategic documents in the field - the National Strategy "Moldova Digitala 2020", Strategic Program of technological modernization of governance (e-Transformation) etc.

Implementing e-Government has both a social and an economic impact [7], [5]. E-Government acts as an innovation catalyst on the economic environment. Besides improving labor productivity in the public sector [3], e-Government represents a great opportunity for companies that develop solutions for public services. A priority in this regard is more active involvement of local companies in implementing e-Government solutions.

5. Conclusion and recommendations

E-government has become an active presence in Moldova. It did significantly increase citizens' interest in the quality of services, in the government in general. Implementation of e-Government service models generates a comprehensive process of creating new values in public administration. The e-Government affects equally the perception of public authorities about the role of public institutions regarding the interest of citizens and also the citizens' perception on government.

The effects of e-Government are both social and economic. A significant part of citizens understands and accepts e-government services. The number of these citizens is growing. It means that the new approaches to public services are opportune and necessary. Governance is becoming more efficient and more transparent and, with it, citizens' confidence in the government increases.

There are sufficient prerequisites in public administration for a deeper and multilateral development of electronic services. It requires a systemic approach to e-Government services. Electronic services in the public sector have not yet reached a satisfactory level of integration responding to the needs

of citizens to benefit from complex services in a consistent, across the public sector without the citizen having to know the whole complexity of the structure of government, either central government or local administration.

There are significant differences between the possibilities of implementing electronic services in urban and rural areas. Also, different social groups have a different attitude in terms of awareness and acceptance of e-Government. These challenges require an inclusive approach that would take into account the interests of all these categories of citizens and their ability to integrate in the community of e-Government users.

The government should adopt and implement more aggressive policies to ensure the development and promotion of e-Governance. National ICT infrastructure allows such approach. There are sufficient premises in terms of readiness of an important part of society to accept new service models. The government should be aware that technological changes need to make reforms that aim governance structure and functions.

A special role in implementing of e-Government models can and must play local companies. They could provide expertise, management and new solutions for the public sector both technologically and in terms of complexity and depth of services.

The imperative for new approaches to e-Government services should be interoperability. Interoperability mechanisms and models should be implemented to re-define and re-configure the business process to ensure service delivery and to enhance the efficiency of e-Governance. They will have the ability to enhance the informational coherence of the various agencies and departments of government, the level of integration and maturity of public services in e-Government system.

6. References

[1] Administrative public services provided at local level: diagnosis and opportunities for e-Transformation (rom.). Center for Sociological Investigations and Marketing „CBS-AXA", Urban Development Institute. Chișinău, 2014.

[2] Benchmarking E-government: A Global Perspective. Assessing the Progress of the UN Member States. United Nations – DPEPA, 2002, http://unpan3.un.org/egovkb/Portals/egovkb/Documents/un/English.pdf

[3] EG4M eGovernment for Mediterranean Countries. Fondo per gli Investimenti della Ricerca di Base (FIRB). Evaluating the Socio-Economic Impact of e-Government. http://siti-server01.siti.disco.unimib.it/eg4m/Doc.pubblici/Deliverable%20II%20anno/5.2.2%20-%20Evaluating%20the%20Socio-Economic%20Impact%20of%20e-Government.pdf

[4] Governance eTransformation Project - Financial Statements, 2012, http://egov.md/ro/transparency/reports/audit-proiect-etransformarea-guvernarii-anul-2012

[5] GRECU, M.: Economic and social impact of eGovernment.. In: Scientific Symposium of Young Researchers. Academy of Economic Studies. Chișinău. (XIII Edition), 24 - 25 April, 2015, pp. 296-301.

[6] KUMAR, V., MUKERJI, B., BUTT, I. and PERSAUD, A.: Factors for Successful e-Government Adoption: a Conceptual Framework, The Electronic Journal of e-Government Volume 5 Issue 1, 2007, pp 63 - 76, www.ejeg.com/issue/download.html?idArticle=89

[7] MADRID, L.: The Economic Impact of Interoperability. Connected Government. Microsoft, 2012, http://download.microsoft.com/download/d/0/1/d01533ed-5be2-468b-afac-558ec549064e/The_Economic_Impact_of_Interoperability.pdf

[8] National survey, Perception, assimilation and acceptance by the population of e-government transformation in Moldova, 2016, http://egov.md/ro/file/3974/download?token=Lnp7lMol

[9] HEEKS, R.: Understanding and Measuring eGovernment: International Benchmarking Studies, 2006, https://pdfs.semanticscholar.org/e23f/0ff178555f885b9a91748a906394c977dc5c.pdf

[10] NAMROUSH, S.A.: Citizen Adoption E-government Services Conceptual Framework. http://comp.utm.my/publications/files/2013/04/Citizen-Adoption-E-government-Services-Conceptual-Framework.pdf

[11] AlAwadhi, S. and Morris, A.: Factors Influencing the Adoption of E-government Services. Journal of Software, vol. 4, no. 6, August, 2009, http://www.jsoftware.us/vol4/jsw040613.pdf

[12] KALVET, T., TIITS, M., HINSBERG, H. (editors): Impact assessment of the Estonian e-government services. Tallinn: Institute of Baltic Studies & Praxis Center for Policy Studies, 2013, https://www.ibs.ee/wp-content/uploads/Impact_assessment_of_the_Estonian_e-government_services.pdf

[13] The strategic program of technological modernization of government - e-Transformation. 2011, Monitorul Oficial, Vols. 156-159. http://lex.justice.md/viewdoc.php?action=view&view=doc&id=340301

[14] United Nations e-Government Survey 2014, E-Government for the future we want, http://unpan3.un.org/egovkb/Portals/egovkb/Documents/un/2014-Survey/E-Gov_Complete_Survey-2014.pdf

[15] United Nations e-Government Survey, 2016, E-Government in Support of Sustainable Development. http://workspace.unpan.org/sites/Internet/Documents/UNPAN96407.pdf

DIGITAL GOVERNANCE: RESEARCH DESIGN OF A COMPREHENSIVE RESEARCH PROGRAM TO ANALYSE ICT DRIVEN TRANSFORMATION

András Nemeslaki[1]

Abstract
The paper presents the theoretical foundations and research design of a comprehensive research program initiated at the National University of Public Service for exploring the complex dynamics of digital transformation of governance and government. In alignment with the Danube Region Strategy the initiative is based on two main pillars: a) concepts of territorial and cross-border governance especially exploring the process from whole-of-government to social participation, and b) information management focusing on ICT ecosystems and project management. Based on these two pillars three drivers of digital transformation are defined which are very tightly intertwined in the research design. The first is what we collectively address as e-services including legal-technical-organizational solutions, citizens´ acceptance and the complex notion of accessibility with trust. The second driver in our model is the appearance of "smartness" in governance both centrally and locally – spanning from knowledge management to smart communities in symbiosis with smart technologies. Finally, the third set of drivers for digital transition is the capability for innovation and change including management and organizations, social impacts of industry 4.0., and a modified Balanced Scorecard system for administration. The paper presents the key research questions in each pillar and maps how institutional collaborations (amongst 7 Hungarian, 3 European and 2 North-American universities) address them methodologically.

Key words: *digital governance, ICT based transformation, e-government research, Hungary.*

1. Introduction

Since the end of 2015, the so called Digital Wellbeing Program (DWP) is the overarching strategy of the Hungarian government for technology based modernization: it has pillars in education, economic development, fast speed network infrastructure, addressing issues of digital era employment and industry 4.0; and very importantly raising awareness for those 21% of Hungarian population (in the age group of 16-74) who are not interested in internet use. A key mechanism to achieve this objective is to lower internet taxes from January 2017.

DWP has given a new thrust to the development of ICT use in the public sphere. By the alignment of other strategies and regulations it very clearly brought a key question to the stage of the Hungarian political theatre: What sort of surprises does the internet hold for governance in Hungary? And stemming from this several other pressing issues come immediately: how does government and governance transform in Hungary (or as a matter of fact generally in other regions) thanks to this immense power of technology? How should the new government model look like? What sort of services, procedures skills and competencies are in demand for this change? How can we prepare decision makers to embracing this transformation?

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This paper introduces and summarizes the research design of a comprehensive, two-year long, research program initiated at the National University of Public Service to investigate this broad problem. Since the Cee E-gov and E-dem conferences are key forums and platforms since 2014, and they plan to be in the following years to come (especially in 2018 and 2019), this submission is structured differently than a classic research report. Firstly, I discuss the environment within which the program has been initiated and with which it has been aligned to. Secondly, I introduce the pillars and research streams with basic arguments for their relevance. Thirdly, the key competencies and knowledge areas of the participating organizations are shown, emphasizing the international element and ambitions to contribute not only to the dilemmas of the Hungarian government, but to the possibilities of broader theoretical extension of transformative governance. Finally, in the summary section, I outline how this program contributes to the Cee E-gov and E-dem conference scheme, to the Danube Region collaboration and how we plan to integrate the contributions of this community into our deliverables.

2. Digital Governance Research Program: strategic environment and objectives

Hungary´s public administration reform is entirely founded from European Social Cohesion and Structural Funds [1], [2]. The Commission has approved the key objectives and deliverables for the absorption of 795mEuro focusing on two key areas: a) reduction of administrative burden and b) enforcing service orientation and ethical operation in public services. ICT deployment, automation, process reengineering and cost reduction are included in the first set of objectives, organized into 31 projects for the value of 400mEuros. This might be considered as the hardware of public reforms in the period of 2014-2020. Software, that is human capacity development, organizational innovation, knowledge transfer and education are incorporated under the service orientation area, where Hungary has planned 15 complex programs for the amount of cc. 200mEuro. This grant entitles the National University of Public Service (NUPS) to define, plan and execute research and development programs, institutional development, and human capacity development for cc. 40 million Euros under the title: KÖFOP 2.1.2 – VEKOP – 15-2016-00001 Public Service Development for Establishing Good Governance. The Digital Governance and Research Program has been designed as part of this endeavour by two academic institutes: the Institute of E-government and the Institute of Governance involving 15 researchers form NUPS and other universities and collaborating organizations (see Table 1).

Hungary´s Public Administration and Public Service Development Strategy (PAPSD) has a dedicated section on the "development objectives for the digital government", particularly to enhance government organizational infrastructure for service orientation; to introduce government services independent from time and space, and to create knowledge intensive organizational capabilities for effective services. Not only the PAPSD strategy, but several other Programs, laws, and decrees establish the importance of using technology for achieving more effective government operations. For instance, Hungary´s Digital Innovation Plan 2014-2020 states the importance of "efficient and secure operation of a service oriented government", and this is in tight alignment with the National Innovation and R+D Strategy 2013-2020 underlining the need to improve the innovation capacity of the public sphere, especially embracing the ICT based adaptive innovation.

Our program was also designed based on apparent need that Hungary has constitutional and very high level legislative commitment to pursuing government transformation. Our constitution in XXVI. section articulates that "The Hungarian State – in order to enhance operational efficiency, the quality of public services, transparency and social inclusion – makes all possible efforts to utilize new technical solutions and scientific achievements." This is a quite enlightening mandate

for NUPS, especially given the fact that several concrete regulations point into these directions: eg. government decree 2012/2015 " the DWP ", which I outlined in the introduction, or the Act L. " on electronic security on central and local government organizations" which is one of the most forward looking Information Security Acts of Europe.

According to the mission of NUPS and its two institutions the Digital Governance Research Program has been set up to support these key strategies and the numerous programs and legal actions with high level intellectual background, knowledge transfer, and in many cases supportive empirical evidence both from Hungarian and international experiences. The concrete topics and their rational is discussed in the following 3rd section.

3. Foundations and research pillars of digital governance

The project has two foundational pillars; assessment of the technology potential what we labelled as "public information management", and related challenges of "governance". Building on these foundations, we determined three drivers of government transformation: e-services, smart governance and the innovation capability of government, as the research model is depicted in figure 1.

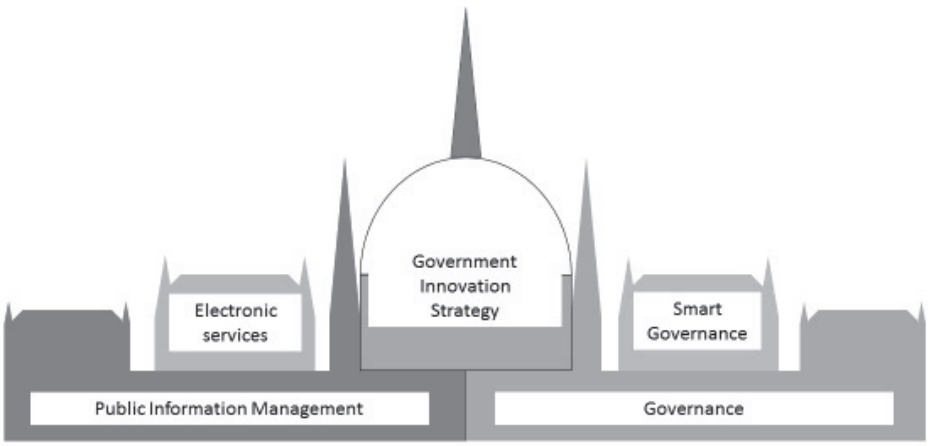

Figure 1: Pillars of the Digital Governance Research Program (DGRP)

3.1 Public Information System Management (PIM)

We classified the research design into three subsections in PIM, which are rooted in information management, technology and science-technology-society disciplines [3]. There is a vast amount of literature on ICT use on public administration, its history goes back almost to the invention time of the computer, yet due to the specialties of public demand and government operations classic business information management results should be deployed with care [4]. Regardless of the fact, that cloud services, big data achievement, business analytics and many other topics of information management have proven great efficiency in business, governments apply them with great concerns due to security reasons, the risks of national sovereignty, taxation, or social inclusion.

3.1.1 Ontology of Public Information Systems and the ICT ecosystem

Our intention is to feed the theory building with empirical data of all sorts, exploring technology and industry drivers in public systems, interrelationships between the ICT ecosystem and administration. This entails a systematic mapping and structuring of the thousands of information systems in Hungarian public administration. In this stream of investigation we would also assess the dominating technology innovations which might be relevant for public administration until 2020.

3.1.2 Success and failour factors of public information system project management

As I referred to this in the introduction, Hungarian government is going to spend 400 million Euros on more than 30 major IT projects modernizing administration. In an earlier study we have shown that in the period of 2007 – 2013, when a similar undertaking took place, result were quite ambiguous, both in deliverables and in absorption of financial resources [1]. Generally, this particular Hungarian problem appears in many other environments, which justifies the need for a thorough investigation in the area of public information project management.

3.1.3 Implications of digitalization

Our previous research experience shows, that deployment of ICT solutions and systems are mainly considered as a legislative and ICT project undertaking. This legal and technology determinism is well established, and produces a vast amount of regulations regarding procedures, and behavioural conduct. In several cases, however, implications on the complex relationships of transparency, public organizations, public policy and politics are overseen [5] – not only in the Hungarian context, - which result in unexpected outcomes. As a third pillar, therefore, we designed a stream of exploratory studies to adjust the "deterministic views" of law and technology with a "constructivist view" of policies.

3.2 Transformative Governance

The second foundational bedding of our research program reaches out to relevant concepts and theories of governance. It is clearly seen, both from the submissions to leading conferences in our field, such as the European Group of Public Administration (EGPA), the International Institute of Administrative Sciences (IIAS), NISPAcee, and the CEE E-gov E-dem, and from the papers of the most respected journals in our field e.g. GIQ or Information Polity, that identity of e-government as a "scientific field" separate from information systems is justified due to its anchoring in political science, public policy and government studies. We classified our activities also into three areas and research directions accordingly.

3.2.1 Transformation of governance from "whole-of-government" to "digital governance".

The theoretical discourse on government´s role is constantly changing [6]. Innovation of technology is one element, but there are other very important aspects from national sovereignty, boosting economic development, respond to challenges of security, ensuring social cohesion and sustainability, just to mention a few. Hungary, as a member of the European Union and as an economically very open country, needs to assess all these governance issues in the context of a complex multilevel web, where "good governance" – which is the dominant approach of the Hungarian government – is basically constantly challenged by the pressure of "doing more with

less" [6]. Systematically going through the technology-governance interplay and duality, in this section we intend to explore these broad drivers of government transformation.

3.2.2 Regional and multilevel governance

History of governments and governing has been conceptualized within national borders and limitations of space. As the role of regions has gained more recognition, the terms of sovereignty, regional governance, governmentality subnational – municipal governance have become utterly important. Governments operating in "soft-space" with multi-level approaches applying the classic proportionality and subsidiarity principles. But how does multi-level governance change with technology? Last year CEEGOV conference topic convincingly argued for the importance of this concept to understand not only the classic dimensions of "levels" such as central government and municipalities but the most recent technology induced problems, such as horizontal networks, expert participations outside administration and/or governing in the age of embedded ubiquitous technology ecosystems of smart cities. Danube Region has a special importance in this respect [7].

3.2.3 Cross-border government

In the European context, one of the greatest obstacle to achieve "regional good governance" is the administrative obstacle at borders [8]. Border regions suffer from their far distance from "government centrals" and also from parallel functionalities on the "other side". These issues are especially problematic to municipalities which are cut across with borders, where citizens´ access to services and institutions is uneven and limited. Hungary, as many European nationalities, has in this aspect great opportunities to enhance and innovate its cross-border collaboration with its neighbours. Conceptualizing "virtual citizenship", similar to the Estonian e-citizenship initiation, is a daring new vision for preserving cultural identities, nurturing relationships, cultivating business collaborations with folks living outside the borders of national states, and to provide a reasonable deployment of government "functionalities" for inhabitants in these regions .

4. Drivers of digital governance

As it is depicted in **Figure** we separated drivers of digital governance from the foundational basics. The first reason for this design approach is, that we wanted avoid the "future prediction" perspective, so instead of forecasting what will happen to government and governance as a result of technology based transformation, we choose to look at dynamics which influence the future. We do this, because, technology trends are not easy to predict from Hungary, and even in the most innovative countries, there is a great difficulty to deal with singularity and exponential rates of ICT development. Our second reason has been, that by building on the foundational areas we can ensure embeddness in theory, and using the drivers we ensure relevance for practice. With this distinction, we intend to maintain both practical relevance and theoretical rigour in our research program.

4.1 Electronic Services

4.1.1 Technology, regulation and the human interface

In order to provide efficient and effective services in the era of digital government, several technology-human interface problems need to be solved [9]. These are for instance secure authentication, identification and maintaining privacy. In the course of this research pillar, our intention is to explore – in many cases through laboratory experiments – how citizens use different

technologies, and how does regulation impact this behaviour. Our scope is not limited only to G2C or G2B directions, but to assess attitudes in relation to the participatory technologies such as social media or electronic voting [10]. The central question in this context is how behaviour, knowledge, technology functionality and regulation interacts to structure effective services.

4.1.2 Citizens view to services

Using the database of the Central Office for Administrative and Electronic Public Services (KEKKH in Hungarian) which contains several thousands of log records, service responses and qualitative assessments, we intend to analyse how citizens view electronic service delivery. In the centre of our inquiry is the false belief that classic digital divide is still prevailing (while the poor and less educated use smart-phones and internet - despite of the mainstream prejudice), and explore how to indoctrinate those 21% of population who are not interested in accessing electronic services [11].

4.1.3 Drivers of use and adoption of services

The third important driver of e-services, according to our design, is the set of soft factors, which have been neglected in the deterministic legal and technology driven IT development programs [12]. In this segment, our research approach investigates the imperative nature of service deployment: that is how active set of actions can influence awareness and motivation for using e-services. Some of the elements in our hypotheses are education, campaigning, marketing etc. and their impact on different citizen groups. Methodologically, we intend to use action research, case analysis and other “clinical” type of research, since our focus is how interventions help influencing service use.

4.2 Smart Governance

The term smartness has two main roots in contemporary thinking about governance [13]. The first, and we can say more traditional, is related to cognition, how knowledge is managed, created and distributed; and how it is supported by technology from knowledge systems, to artificial intelligence applications. The second, and more recent, is in connection with sensor technologies, ubiquitous, pervasive ICT – the so called internet-of-things (IOT) – and powerful analytics of processing the unprecedented amount of information – the so called big data. In our research model we approach this issue from two directions.

4.2.1 Knowledge governance – knowledge based public policy

In corporate setting the idea of “knowledge governance” has been in use for a while. It is partly replacing, partly expanding the classic “knowledge management” ideas. Our main questions in this context are what knowledge governance can do to support better policy design, and how this approach can be institutionalized in government procedures [14]? We focus both on central and local government.

4.2.2 Smartness in cities and in citizen relationships

This second direction exploring smartness takes almost a grassroots approach to examine how the new smart ecosystem is working. This ecosystem emerges from the symbiosis of IOTs, individual citizens, coordinating mechanisms, local governments and entrepreneurship [13]. This special form of multi-level governance, which we empirically witness in smart cities, can be conceptualized as a new platform of collaboration, impacting G2B, G2C but in many aspects C2C relationships as well.

4.3 Government Innovation Strategies and Capabilities

As Figure. shows, the third driver of digital government transformation is the most integrative one, embracing both technology management and public governance streams, aggregating them into strategic, innovation and leadership capabilities. These are crucial for successful transformation. As I argued earlier, governments need to do more with less – they need to continuously develop leadership practices and to adopt innovations.

4.3.1 "Administrategy"

In their breakthrough research, two Polish academics introduce the concept of "administrategy" with the combination of "administration" and "strategy" [15]. They argument is, that if Poland/Hungary/Romania/Ukraine want to move beyond their current state of middle-income development, it is necessary to be critical toward mainstream governance and developmental approaches, which, not so long ago, served as our unquestioned benchmarks. They illustrate with examples that sustainable solutions for local, municipal and even to central governments are to innovate their own focused strategies – their "own stories", as they put. Aministrategy combined with technology leadership might be the new way for Central Europe for catching up in global competition.

4.3.2 Dealing with the "second machine age" - the implication of industry 4.0

ICT development, artificial intelligence, robotics and the demand for advanced manufacturing has institutionalized a new human-machine collaboration era – the so called industry 4.0. This new form of information society raises many broad questions for the future of employment, policies for economic development, education, healthcare and social services at large - especially for industry development [16]. This is pivotal for Hungary, given the fact that machine industry (vehicle and automobile assembly) is a key component of Hungary´s GDP and growth potential.

4.3.3 Public Balance Scorecard and the management requirements

The third pillar of the government strategy research stream examines how management and leadership performs in the Hungarian government in terms of attitudes, motivation and concrete results. For measurement, we intend to use Kaplan and Norton´s balanced scorecard (BSC) model – assessing financial, process, human, and innovation areas – by extending it with appropriate indicators for good governance [17].

5. Partners

Collaborating partners of the research program are listed in Table TableGiven the importance of alignment with Hungary´s e-government strategies, most partners are Hungarian universities,

research centres and associations. International embeddedness and theoretical contributions to political science, information management and public administration are provided by collaboration with research partners outside of Hungary.

In order to ensure that latest technology leadership and change management research is incorporated we work together with two leading US schools in this area, and eminent scholars, who have many years of experience in this field. Alignment to regional and European development strategies are built in by building on the four-years experiences with Cee E-gov and E-Dem Conferences and the Danube Region Strategy partners mainly represented by Ludwisgburg University of Applied Sciences and University of Economics and Management in Vienna. Working together and compering empirical results with similarly developed countries as Hungary is essential to get meaningful results. Therefore, including comparative analysis from neighbouring countries, and from countries with similar historical, economic and cultural development path, we collaborate intensively with organizations in the NISPAcee network as well. Focused and close research plan is developed with one of the leading regional schools in public administration; the College of Political, Administrative and Communication Sciences at the Babes-Bolyai University.

	Institution	Country	Area/Competency
1	National University of Public Service	HU	Public Information Systems Government Theories Public Service Strategy
2	Corvinus University of Budapest	HU	IT Project Management IT cost-benefit Financial analysis of IT investments
3	Budapest Business School	HU	Smart city Digital Antropology Social Media
4	Óbuda University – Center for Digital Culture and Human Technologies	HU	Digitalization Digital Antropology Technology Adoption
5	University of Szeged – Interdiszciplinary Knowledge Management Center	HU	Knowledge mangagement E-government policy Information Society View
6	CESCI	HU	Multi-level governance, Cross-border governance Regional governance

	Institution	Country	Area/Competency
7	Magyary Zoltán E-Government Association	HU	E-services, E-government
8	College of Political, Administrative and Communication Sciences (Babes-Bólyai University)	RO	Public Administration Theory E-government E-participation
9	Department of Information Systems and Operations (WU-Vienna)	AT	ERP systems E-participation Danube-region collaboration
10	Ludwigsburg University of Applied Sciences	DE	ERP systems eID and services Danube-region collaboration
11	Robert A. Fossie School of Business (Worcester Polytechnic Institute)	USA	Technology based innovation Information Systems Management
12	University of Wisconsin, LaCross, College of Business and Administration	USA	Leadership Change management

Table 1: Collaborating partners in the Digital Governance Research Program

6. Conclusions and the way Forward

NUPS´s digital governance research program is rather ambitious regarding its indicators. During its execution time – between 2017 January and 2018 September – targets 85 different publications (papers, monographs, research reports), 10 international conferences and workshops in Budapest, participation in some 20 major international conferences (EGPA, NISPAcee, DEXA/EGOVIS, etc.), and around 15 study trips between research partners.

As for the methodologies, during the program, both quantitative and qualitative methods are planned to be used, form expert Delphi studies, through advanced internet based software development - such as web-crawlers and system dynamics simulation, - all the way to classic empirical surveys. These mix of methods will enable the partners both to explore new phenomena and to test well established hypotheses.

Finally, it is important to emphasize, that the program is open-ended both in its staffing, and its time span. We welcome researchers with ideas and publication initiatives, during the research period and after that as well. The Cee E-gov and E-dem community is a very important testing audience and sounding board to reflect on the results, and to help developing our discipline forward.

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8. References

[1] ARANYOSSY, M., NEMESLAKI, A. and FEKÓ, A.: Empirical Analyis of Public ICT Development Project Objectives in Hungary. International Journal of Advanced Computer Science and Applications, v. 5, n. 12, 2014, p. 45-54.

[2] NEMESLAKI, A.: The theory of IT-Government Alignment: Assessment of strategic fit in Hungary´s case. Multi-Level (e) Governance: Is ICT a means to enhance transparency and democracy? CEE e-Dem and e-Gov Days 2016. Vienna-Budapest: Austrian Computer Society, 2016, p. 85-92.

[3] ZABUKOVSEK, S. S. et al.: Bibliometric Analysis of E-government Research. Multi-Level (e) Governance: Is ICT a means to enhance transparency and democracy? CEE e-Dem and e-Gov Days 2016. Vienna-Budapest: Austrian Computer Society, 2016, p. 259-272.

[4] BANNISTER, F. and CONNOLLY, R.: Forward to the past: Lessons for the future of e-government from the story so far. Information Polity, v. 17, n. 3-4, 2012, p. 211-226.

[5] CORDELLA, A. and TEMPINI, N.: E-government and organizational change: Reappraising the role of ICT and bureaucracy in public service delivery. Government Information Quarterly, v. 32, n. 3, 2015, p. 279–286.

[6] KADAR, K.: Good Governance: International Dimension. Budapest: National University of Public Service, 2015.

[7] BALTHASAR, A. et al.: Multi-Level (e) Governance: Is ICT a means to enhance transparency and democracy? CEE e-Dem and e-Gov Days 2016. Vienna-Budapest: Austrian Computer Society, 2016, p. 259-272.

[8] OCSKAY, G.: ICT enabled cross-border governance. In: NEMESLAKI, A. ICT Driven Public Service Delivery: Comparative Approach Focusing on Hungary. Budapest: National University of Public Service, 2014, p. 123-136.

[9] BROWN, D.: Electronic government and public administration. International Review of Administrative Sciences, v. 71, n. 2, 2005, p. 241.254.

[10] MEDAGLIA, R.: eParticipation research: Moving characterization forward (2006–2011). Government Information Quarterly, v. 29, n. 3, 2012, p. 346–360.

[11] EUROPEAN COMMISSION. Scoreboard 2014 - Developments in eGovernment in the EU 2014. Digital Agenda for Europe, 28 maio 2014. Disponivel em: <https://ec.europa.eu/digital-agenda/en/news/scoreboard-2014-developments-egovernment-eu-2014>. Acesso em: 26 nov. 2014.

[12] IRANI, Z. et al.: An analysis of methodologies utilised in e-government research: A user satisfaction perspective. Journal of Enterprise Information Management, v. 25, n. 3, 2012, p. 298-313.

[13] RODRIGUEZ, B., MANUEL, P. and MEIJER, A.: Smart Governance: Using Literature Review and Empirical Analysis to Build a Research Model. SOCIAL SCIENCE COMPUTER REVIEW , v. 34, n. 6, 2016, p. 673-692.

[14] PEE, L. G. and KANKANHALLI, A.: Interactions among factors influencing knowledge management in public-sector organizations: A resource-based view. Governement Information Quarterly, v. 33, n. 1, 2016, p. 188-199.

[15] KISILOWSKI, M. and KISILOWSKA, I.: Administrategia (in Hungarian). Budapest: HVG, 2017.

[16] BRYNJOLFSSON, E. and MCAFEE, A.: The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies. New York, USA: W.W. Norton & Company, 2014.

[17] KAPLAN, R. S. and NORTON, D. P.: The Balanced Scorecard: Translating Strategy into Action. Boston, MA: President and Fellows of Harvard College, 1996.

E-COHESION MATURITY: HOW TO MEASURE THE EFFICIENCY OF DIGITAL COHESION POLICY

Tamás Laposa[1]

Abstract
This paper focuses on the maturity of e-government services on the domain of European fund management, to explore the measurability of potential efficiency gains.

The practical relevance of the topic is that the current European legislation prescribes that Member States shall offer electronic fund management services to beneficiaries to foment the efficient use of European Structural and Investment Funds. The main driver of this concept is the reduction of administrative burdens which can be achieved by the Europe-wide utilization of paperless fund management tools and by harnessing the interoperability of information systems. In the scientific discourse, the above concept is labelled as "e-Cohesion". However, the legislation sets quite broad requirements for its implementation, so the e-Cohesion landscape and the intended efficiency gains may appreciably differ from country to country. The exploration of this "digital efficiency divide" offers a new relevant research opportunity. Therefore, this article is dealing with the measurability of efficiency of e-tools to methodologically support Member States in the realization and fine-tuning of their national e-Cohesion concepts.

It is presented in this paper that the level of potential efficiency gains is connected to e-government readiness, i.e. the maturity of e-Cohesion systems. The paper, therefore, systematically reviews the relevant e-Government literature on the issue of maturity. Based on this, it aims to identify the most important models and methodological elements which address the main attributes of e-Cohesion to pave the way for further empirical research and the creation of an e-Cohesion-specific maturity model.

1. Introduction

According to Regulation (EU) No 1303/2013 of the European Parliament and of the Council the EU provides funds for EU Member States through multi-annual development programmes in order to implement the Union strategy for smart, sustainable and inclusive growth, as well as the Fund-specific objectives including economic, social and territorial cohesion. Pursuant to the legislation arrangements for the implementation and use of the funds shall take into account the overall aim of reducing the administrative burdens on beneficiaries and bodies involved in the management and control of the programmes. [11]

With regard to these provisions, the Commission started the e-Cohesion initiative to contribute to the reduction of administrative burdens and the effective implementation of the funds. E-Cohesion is a set of procedural, legal, technological and organisational components to support the provision of effective e-Government services. However the maximisation of efficiency gains depends on the decisions of Member States, since the European legislation sets minimum requirements for electronic services. As proven by the study of the European Commission and Deloitte, efficiency

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gains can be realized at different levels and the rate of improvements can be significant. [10] This paper attempts to show that the progress made could be best described with the methodology of maturity models. The maturity of e-Cohesion and the targeted efficiency gains are influenced by a wider range of attributes than addressed in the above model. Moreover there is no specific maturity model that can address the complexity of these attributes.

This paper has three main aims: first, to review the methodology of maturity models and those models relevant from the perspective of e-Cohesion; second, to identify the main measurable attributes of e-Cohesion and the relevant maturity models addressing them; and third, to make proposals for further research and the elaboration of an e-Cohesion-specific maturity model.

2. The methodology of maturity models

Lahrmann et al. defines maturity as "the state of being complete, perfect or ready" where this stage can be achieved by an evolutionary progress from an initial stage to an end stage. [14] The concept of maturity measurement was published by the Software Engineering Institute (SEI) – Carnegie Mellon with the introduction of the Capability Maturity Model (CMM). [6] Reviewing the relevant papers, it can be found that more than a hundred of different models on different domains have been created since. [4] In this section, the role and typology of maturity models are explained in detail to develop a better understanding on its methodological background.

2.1 The role of maturity models

Caralli et al. defines a maturity model as a set of characteristics, attributes, indicators or patterns representing progress in a particular domain or discipline. These models help organizations to evaluate and benchmark their practices, processes and methods against a clear set of standards or best practices of the given domain or discipline. Organizations can apply maturity models to define their current level of maturity and then determine the expected path of improvement [19]

According to *Bruin et al.* maturity models are evaluative tools to assess and increase the maturity (competency, capability, level of sophistication) of a specific domain on the basis of an agreed set of criteria. [6]

A maturity model represents a desired evolution path for organisations or processes as discrete stages (a sequence of maturity levels). [4] The most frequently-used way of evaluation is a five-point Likert scale where Level 5 represents the highest level. [6] Levels represent the transitional states in the model, they describe evolutionary steps or express a measurable attribute. Attributes are the core model components that appear on each level. They are based on best practices or standards expressed as characteristics, indicators or processes. [19]

In the model organisations or processes advance between an initial stage and a final stage that represents total maturity. During this advancement the capabilities of the organisations or their process performance progresses evolutionarily. The maturity model is a tool to determine the position of the organisation or the process on the evolution path by providing criteria and characteristics to be fulfilled to reach a particular maturity level. [4]

2.2 Typology of maturity models

Reviewing the constituent literature, it can be noticed that maturity models focus on different maturity factors such as *process maturity* (to which extent a specific process is defined, managed, measured, controlled, and effective), *object maturity* (level of sophistication of a software or a machine) and *people capability* (ability of knowledge creation and proficiency enhancement). From the perspective of maturity factors models can be one-dimensional or they can address different factors at the same time. [17]

As to the nature of maturity assessment models they can be descriptive, prescriptive or comparative. A *descriptive model* is simply used for the assessment of the current state of play i.e. the as-is situation without any provisions for further improvement of maturity. A *prescriptive model* focuses on maturity improvement and enables the elaboration of an improvement roadmap on a specific domain. A *comparative model* enables benchmarking across different organisations, industries or regions. [6]

Concerning the structure of maturity stages, *fixed-level and focus area maturity models* can be distinguished. Fixed-level models consist of generic maturity levels and they are well-suited to assessment and benchmarking of organizations. In many cases, these models cannot capture the interdependencies of the different processes that need to be improved in a specific domain. Focus area maturity models identify focus areas that need to be developed and the distinct focus areas have a different evolution path i.e. the number of development stages can vary from area to area. These models enable a more balanced and incremental improvement by helping organisations to address the complexity of the factors determining the effectiveness of a specific domain. [5]

2.3 E-Government maturity models

Maturity models are widely used in the domain of e-Government. From a scientific perspective, the most cited models are – for instance – *the Layne and Lee* [16] and the *Andersen and Henriksen* [2] models.

The Layne and Lee model is one of the earliest models to measure the structural transformation of public services. The four-stage model helps governments planning the introduction of Internet-based government models and the model supports the measurement of technological-organizational complexity and the integration of e-Government services. [16]

Andersen and Henriksen argue that models as *Layne and Lee* approach digital services from the perspective of technology integration by predominantly focusing on issues as information quality, efficiency, and effectiveness. The authors propose to refocus e-Government models on the front-end of government and the benefits of end-users by measuring activity and customer centricity. [2]

3. The e-Cohesion concept

3.1 Reduction of administrative burdens - the creation of the e-Cohesion concept

In 2010, the European Commission initiated an Action Programme to simplify administrative requirements and eliminate unnecessary administrative burdens on businesses, small businesses in particular. The Action Programme identified 13 priority areas for administrative burden reduction, where Cohesion policy was one of the priority areas with an estimated 24% reduction of

administrative costs. [7] Experts argued that the above reduction could be realised by the provision of interactive portal services, where beneficiaries can submit all necessary information digitally. The introduction of online portal facilities could minimise multiple information requests and reduce the scope of paper-based information obligations. These measures contribute to the improvement of efficiency which is the main driver of the reduction of burdens.

Following the above recommendations, the Commission launched an initiative, focused on the reduction of administrative burdens of cohesion policy and also rural development policy by the provision of electronic data exchange services via online portals. The initiative was labelled as "*e-Cohesion*" addressing a wide range of legal, procedural, organisational and Member State-specific factors. E-Cohesion is not simply an IT issue. It is a framework of specific components to reduce administrative burdens via the implementation of e-Government services. [9]

To ensure the expected level of efficiency, the Commission included the requirements of the e-Cohesion concept in the legal provisions of funding in the 2014-2020 period. Regulation (EU) No 1303/2013 of the European Parliament and of the Council specifies the three fundamental components of e-Cohesion: the provision of ***electronic data exchange services***, ***interoperability*** of systems and the implementation of the ***only once encoding*** principle.

The digital nature of the new funding procedures requires specific conditions to guarantee the quality, effectiveness and the authenticity of services. For this reason the fundamental components need to be supplemented by additional components, such as ***e-signature, e-document management and e-audit***. Their main requirements are regulated by Commission Implementing Regulations (EU) No 821/2014 and No 1011/2014. [15]

3.2 The components of e-Cohesion

3.2.1 Electronic data exchange

Member States shall ensure that all exchanges of information between beneficiaries with a grant agreement and the relevant authorities can be carried out by means of electronic data exchange systems.

Taking into consideration the specificities of national regulations, the European legislation leaves it to the Member States to make the use of e-Cohesion compulsory or optional to clients. It is also up to the Member States whether they provide electronic services for only beneficiaries or they make these services available to applicants applying for a grant as well. The expanding use of financial instruments – particularly when those are combined with grants – brings a new area with some specific features where the interpretation of e-Cohesion is to be addressed. [3]

Taking into consideration the full-electronic nature of procedures, the legislation sets specific technological requirements (security, system availability, data integrity, data protection and privacy, methods of authentication and the minimum functionality of electronic portals) to guarantee the quality of services and the efficiency of procedures. [12]

3.2.2 The "*only once encoding*" principle and interoperability

Data and documents regarding a single development project shall be shared and re-used by the authorities involved in the management of the same development programme. The relevant

authorities cannot ask for the same data repeatedly. The application of the principle is strongly interlinked with interoperability. [12]

Interoperability can be defined as "*the ability of disparate and diverse organisations to interact towards mutually beneficial and agreed common goals, involving the sharing of information and knowledge between the organisations, through the business processes they support, by means of the exchange of data between their respective ICT systems*". Henceforth, interoperability is not simply a technological issue. It requires the cooperation of authorities at legal, organisational, semantic and technical levels. [12, 8]

As a prerequisite of the principle, the regulation sets the cooperation of authorities at development programme level as a minimum requirement. These measures avoid multiple data requests at programme level but it leaves the possibility open for Member States to manage different programmes in separate IT systems. [12]

3.2.3 E-signature

As electronic data exchange transactions are carried out digitally an adequate level of authentication is required to guarantee the veracity of transactions. The regulation sets internationally-accepted standards stating that transactions shall bear an electronic signature compatible with one of the three types of electronic signature defined by **Regulation (EU) No 910/2014 of the European Parliament and of the Council**. The required level of authentication depends on national laws and requirements on verification and audit. [12]

3.2.4 E-document management

The digitalisation of procedures changes the nature of document submission and management. This requirement has both procedural and technological implications. From one side, the accepted data carriers and the compliance criteria of digital documents shall be laid down by national authorities, on the basis of national legal requirements and audit standards. From the other side, IT systems shall be equipped with adequate document management capabilities and they shall meet accepted security standards to ensure the compliance of electronic documents with national requirements. [11, 13]

3.2.5 Electronic audit

In certain cases, national audit and verification requirements and the paperless business procedures might be in conflict, so the concept of e-Cohesion needs to bring them in balance by providing guarantees for the compliance of documents and data while still enabling digital submission. For this reason, the legislation defines that digital documents are reliable sources for audits and financial verification if they have been submitted via the electronic data exchange system. This provision is based on the previously mentioned requirement that electronic data exchange systems need to meet national legal requirements, compliance rules and security standards. [12]

3.3 The maturity of e-Cohesion

The European legislation sets minimum requirements that ensure the expected efficiency gains, but the requirements need to be adapted to national specificities and further particularized by national legislation. [12] It is the decision of each Member State to adopt the minimum framework of

requirements or to go beyond them. This means that the e-Cohesion solution and the level of total efficiency gains may differ from country to country.

If a country decides to go beyond the minimum requirements of e-Cohesion and applies more mature solutions they can reach a higher level of efficiency. Thus, efficiency has different stages that can be achieved according to the decisions of Member States. The Commission and Deloitte elaborated a maturity model to measure the sophistication of e-Cohesion portal functionalities and potential efficiency gains. Based on this model an annual 8 % of administrative burden reduction could be estimated, if the highest level of portal sophistication would be implemented in all EU Member States. [10] The schematics of this maturity model are shown in *Figure 1*.

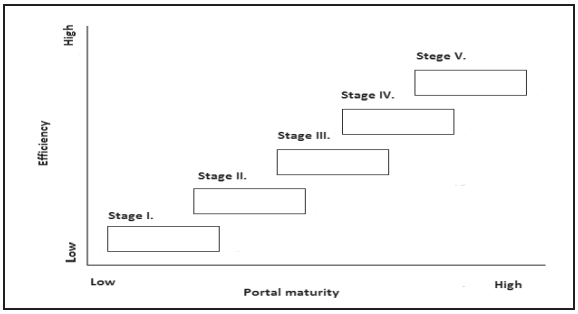

Figure 1: The schematics of the current e-Cohesion maturity model

The above model provides a good roadmap for Member States to plan the development of e-Cohesion portals but it dominantly focuses on the functionality of e-portals. Further attributes can be found, which significantly contribute to the efficiency of e-Cohesion concepts. It is reasonable to assume that the success of e-Cohesion is influenced by a wider range of attributes. Therefore the upcoming section is dealing with the identification of e-Cohesion attributes to help understanding the complexity of e-Cohesion maturity.

4. Attributes of e-Cohesion

The first thing to be considered is that maturity is based on the progression of certain measurable attributes that are specific to the relevant domain. In this section, the main attributes of e-Cohesion influencing efficiency are to be identified. Primarily, the concept of e-Cohesion defines six components setting the minimum requirements of implementation. It should be further analysed to what extent these components exert influence on its maturity. Furthermore, e-Cohesion is an e-Government project so the relevant literature on the maturity of e-Government portals will be reviewed as well. [15]

4.1 e-Cohesion-specific factors

The concept of e-Cohesion defines six components (*electronic data exchange, only once encoding, interoperability, e-signature, e-document management and electronic audit*) which are summarized in the below table:

Component	*Requirement No.*	*Minimum requirements*
Electronic data exchange	1.	security and availability
Electronic data exchange	2.	data protection and privacy
Electronic data exchange	3.	data integrity
Electronic data exchange	4.	methods of authentication
Electronic data exchange	5.	minimum functionality of portals
Only once encoding	6.	no repeated data request by different authorities at development programme level
Interoperability	7.	cooperation of relevant authorities at development programme level
E-signature	8.	authentication with one of the three types of electronic signatures
E-document management	9.	electronic document management systems with an adequate level of security
Electronic audit	10.	adequate level of security of the electronic system

Table 1: minimum requirements of e-Cohesion components

The analysis reveals that most of the above requirements (*No. 1.-4. and 8.-10.*) are connected to the sound electronic management (*security, integrity, authenticity, privacy, availability*) of data and documents instead of focusing on the efficiency of procedures and the reduction of administrative burdens. Therefore, these requirements are not connected to the maturity of e-Cohesion in the scope of this research.

In terms of portal functionality (No. 5) Commission Implementing Regulation (EU) No 1011/2014 prescribes that electronic data exchange systems shall be equipped with at least the following functionalities: *interactive forms and/or forms prefilled by the system, automatic calculations, automatic embedded controls which reduce repeated exchanges of documents or information, system-generated alerts, online status tracking*. [12] These functions are directly linked to the reduction of burdens and the issue of efficiency. However Member States can add further functions to improve the level of maturity, so this requirement has a direct influence on efficiency gains as it is addressed by the available model of the Commission and Deloitte.

The principle of only once encoding (No. 6 and 7) and interoperability are strongly interrelated and their higher level of maturity can also increase efficiency. Their minimum requirements ensure efficiency gains within the limit of a single development programme. Here the efficiency of fund management can be further extended if a Member State applies these components for all development programmes. In case of interoperability, system connections to national databases and the automatic retrieval of relevant beneficiary data can further improve efficiency. These factors are proposed to be addressed by the e-Cohesion maturity model.

4.2 General e-Government related factors

Upon reviewing the relevant papers, it can be concluded that a wide range of pertinent models are available in the scientific literature. The paper of *Abdoullah Fath-Allah et al.* compares the similarities and differences of 25 e-Government maturity models among others with regard to the main attributes of these models. [1] These attributes provide further measurement criteria on the maturity of portals, so the paper contains important inputs from the perspective of this research. The following table recapitulates the above attributes to help analysing their relevance for e-Cohesion:

Attributes	*Definition*
One stop shop	The e-portal is a single point of entry for all e-government services.
Customer centricity	The services or the e-portal are designed from a citizens' perspective and not from an institutional one.
Personalization	Citizens can personalize and customize the e-portal's functionalities according to their needs.
Interoperability	Cooperation of government agencies to work together and exchange information.
Payment	Citizens can pay in the e-portal via credit/debit cards.
E-participation	Involvement of the citizens in the e-government process using comment forms, surveys, e-voting.

Table 2: main features of e-Government maturity models [1]

E-Cohesion does not restrict the usage of separate IT systems for the management of different programmes. This means there can be more than one e-Cohesion portal in a Member State. In this situation beneficiaries might need to use different portals for different types of projects which can complicate the administration of projects compared to the usage of a single e-portal for all funds. Hence the *principle of one stop shop* can place e-Cohesion portals on a higher level of maturity.

As proven by empirical research the complex relationship of technology and society requires a special attention in public sector IT projects. [18] Usability and user-orientation are crucial factors in creating added value to citizens and making administrative arrangements easier, so *customer centricity and personalization* have an undoubted impact on the efficiency of e-Cohesion.

As regards *interoperability* its importance has already been covered in the former subsection. In terms of *payment* beneficiaries do not need to effect financial transactions via the e-Cohesion portal, so this feature has no relevance.

In the reviewed models*, e-participation* mainly focuses on portal functions facilitating the political involvement of citizens. From this perspective e-participation has no relevance for e-Cohesion. From another point of view, e-portals can offer further functions that extend the limits of involvement of beneficiaries in administrative procedures. E-Cohesion is focused on the electronic exchange of formal information. Nonetheless beneficiaries often contact the authorities with informal questions regarding their administrative tasks or the usage of certain functions. Thus, portal features facilitating informal communication between authorities and beneficiaries can channel all information exchanges in one platform which can have a positive impact on the efficiency of e-Cohesion.

5. The maturity of e-Cohesion

After the analysis of attributes, the goal of this paper is to identify the most important maturity models in the pertinent literature that address the above factors. Based on the analysis areas for further research and the creation of an e-Cohesion-specific maturity model covering all relevant attributes are also proposed.

5.1 Review of e-Government maturity models

In the former section seven attributes (*portal functionality, only once encoding, interoperability, one stop shop, customer centricity, personalization, e-participation*) were identified which are relevant in the respect of the maturity of e-Cohesion. For the identification of pertinent models the findings of *Abdoullah Fath-Allah et al.* were used, comparing 25 relevant models and the study of the Commission and Deloitte which contains a maturity model on one of the e-Cohesion

requirements namely the functionality of e-Cohesion portals. [1, 10] Reviewing the above documents the next models were identified:

	Functionality	*Only once encoding*	*Interoperability*	*One stop shop*	*Customer-centricity*	*Personalization*	*Participation*	*Sum*
Accenture			*x*		*x*		*x*	**3**
Alhomod *et al.*			*x*					**1**
Almazan and Gil-Garcia			*x*	*x*	*x*	*x*	*x*	**5**
Andersen and Henriksen			*x*		*x*	*x*		**3**
Chandler and Emanuel			*x*					**1**
Chen *et al.*			*x*					**1**
Cisco			*x*			*x*	*x*	**3**
Commission , Deloitte	*x*							**1**
Deloitte and Touche			*x*	*x*	*x*	*x*		**4**
Gartner group			*x*			*x*		**2**
Hiller and Belanger			*x*	*x*			*x*	**3**
Howard							*x*	**1**
Kim and Grant			*x*				*x*	**2**
Layne and Lee			*x*	*x*			*x*	**3**
Lee and Kwak			*x*				*x*	**2**
Moon			*x*				*x*	**2**
Netchaeva				*x*			*x*	**2**
Reddick				*x*				**1**
Shahkooh *et al.*			*x*	*x*			*x*	**3**
Siau and Long			*x*	*x*		*x*	*x*	**4**
UK National Audit Office			*x*	*x*		*x*		**3**
United Nations			*x*		*x*		*x*	**3**
Wescott			*x*	*x*			*x*	**3**
West				*x*		*x*	*x*	**3**
Windley			*x*		*x*		*x*	**3**
World Bank							*x*	**1**
Sum	**1**	**0**	**20**	**11**	**6**	**8**	**17**	

Table 3: the relation of maturity models and the attributes of e-Cohesion [1, 10]

The analysis shows that only one model focuses on portal functionality since the model of the Commission and Deloitte was especially focused on e-Cohesion functions. Only once encoding is a rather specific feature, it is covered by none of the models. As to the linkages between the models and the seven attributes, 7 models cover only one of them, 5 of them handle two, 11 models focus on three attributes, 2 models cover four and one model handles five of them.

5.2 Further research and recommendations

The concept of e-Cohesion is expected to reduce administrative burdens significantly which can be realized by the improvement of the efficiency of fund management procedures. Based on the analysis of the relevant literature the complexity of the identified attributes can be measured either partially or on a one by one basis. Therefore, a model offering a comprehensive assessment of all attributes opens a new and challenging research opportunity. The rationale and motivation of further research is that current model of the Commission and Deloitte already forecasts a significant improvement of efficiency which could be better understood or even extended with a more comprehensive assessment.

What already exists is a specific maturity model, the identified attributes of e-Cohesion and some relevant models that could support the further research. Since the above model is specifically focused on e-Cohesion, its extension is proposed to enable the assessment of all identified attributes.

Considering the structure of the new model a methodological transformation is suggested, and should be based on a focus area approach. The classical five-level setup cannot be interpreted in case of certain attributes defined by fundamental features of the system architecture (*a single one stop shop portal or more portals*) or national legislation (*application of the only once encoding principle and interoperability to all programmes or in a single programme*). These attributes can have a strong impact on efficiency but their character will not be changed as the maturity of e-Cohesion advances. Consequently the context of measurable attributes is rather complicated so they cannot be addressed by generic maturity levels.

According to the method of measurement of the seven attributes, it is proposed to use the models identified in the previous section as a methodological basis. To focus the scope of models to start with, it is recommended to further analyse the models that address at least three attributes. These models are in alphabetical order: *Accenture (3), Almazan and Gil-Garcia (5), Andersen and Henriksen (3), Cisco (3), Deloitte and Touche (4), Hiller and Belanger (3), Layne and Lee (3), Shahkooh et al. (3), Siau and Long (4), UK National Audit Office (3), United Nations (3), Wescott (3), West (3), Windley (3)*.

Needless to say, the new model must be validated in practice to be theoretically sound and effective, so it shall be based on a strong empirical research among Member States.

6. Summary and conclusions

The concept of e-Cohesion is aimed at the provision of e-Government services in order to improve the efficiency of funding procedures in the area of European cohesion policy and rural development policy. These efficiency gains can realize a significant reduction of administrative burdens. In addition to the European legal provisions national regulations can further extend the level of efficiency gains. As a result e-Cohesion can be realized on differentiated stages of maturity as also proven by the study of the Commission and Deloitte. [10] This progress can be best addressed with the methodology of maturity models.

The European Commission and Deloitte made a specific e-Cohesion maturity model but it dominantly focuses on the functionality attribute of e-Cohesion portals. Based on the analysis of e-Cohesion requirements and the relevant literature seven attributes (*portal functionality, only once encoding, interoperability, one stop shop, customer centricity, personalization, e-participation*) were identified which are relevant from the perspective of efficiency. Reviewing the pertinent maturity models there is no specific model that can address the complexity of these attributes.

Taking into consideration the high rate of expected efficiency gains there is a room for further research to create a new comprehensive model addressing all identified attributes to develop a better understanding on e-Cohesion. In conclusion, the new model should be the extension of the Commission and Deloitte model and the research shall utilize the methodology of the relevant e-Government models that address at least three of the identified attributes.

7. References

[1] ABDOULLAH, F., LAILA, C., RAFA, E. A. and ALI, I.: E-Government maturity models: a comparative study (Chapter 3), in: International Journal of Software Engineering & Applications (IJSEA). Vol. 5, 2014.

[2] ANDERSEN, K. V. and HENRIKSEN, H. Z.: E-government maturity models: Extension of the Layne and Lee model. Government Information Quarterly, 23(2), 2006, p.236–248.

[3] BATÓ, M.: National Regulatory Background for Financial Instruments established from the 2014-2020 ESI Funds - First Experiences in Hungary in European Structural and Investment Funds Journal (EStIF Journal), 4/2016. (Lexxion Publisher, Berlin. 2017, pp. 214-218).

[4] BECKER, J., KNACKSTEDT, R. and PÖPPELBUSS, P.: Developing Maturity Models for IT Management - A Procedure Model and its Application. Business & Information Systems Engineering 1(3), 2009, pp. 213-222.

[5] BEKKERS, W , VAN STEENBERGEN, M., BOS, R., BRINKKEMPER, S. and VAN DE WEERD, I.: The design of focus area maturity models. In: Winter, R., Zhao, J.L., Aier, S. (eds.) DESRIST 2010. LNCS, vol. 6105, 2010, pp. 317–332, Springer, Heidelberg.

[6] BRUIN, T. DE., FREEZE, R., KULKARNI, U. and ROSEMANN, M.: Understanding the Main Phases of Developing a Maturity Assessment Model. In: Proceedings of the 16th Australasian Conference on Information Systems. Sydney, 2005.

[7] EUROPEAN COMMISSION, Action Programme for Reducing Administrative Burdens in the EU, Office for Official Publications of the European Communities (Pages 3, 8), Luxembourg, 2010.

[8] EUROPEAN COMMISSION, European interoperability framework EIF) for European public services (Pages 1, 2), in: Official Journal of the European Union, 2010.

[9] EUROEAN COMMISSION, Draft opinion of the High Level Group, Administrative burden reduction; priority area Cohesion Policy, second opinion - eCohesion Policy (Pages 3-5), Brussels (2011), Viewed 5 January 2017, [online]. http://ec.europa.eu/smart-regulation/refit/admin_burden/docs/120430_opinion_ecohesion_en.pdf

[10] EUROEAN COMMISSION, eGovernance study at EU / Member State level, Draft final report by Deloitte, (Pages 14 – 15, 48), Brussels (2012), Viewed 5 January 2017, [online]. http://ec. europa.eu/agriculture/external-studies/2012/e-%20government/fulltext_en.pdf

[11] EUROPEAN COMMISSION, Regulation (EU) No 1303/2013 of the European Parliament and of the Council (Articles 4, 122, 140), in: Official Journal of the European Union , 2013.

[12] EUROPEAN COMMISSION, Commission implementing regulation (EU) No 1011/2014 (Chapter II.), in: Official Journal of the European Union, 2014.

[13] EUROPEAN COMMISSION, Commission implementing regulation (EU) No 821/2014 (Chapter III.), in: Official Journal of the European Union, 2014.

[14] LAHRMANN, G., MARX, F., METTLER, T., WINTER, R. and WORTMANN, F.: Inductive Design of Maturity Models: Applying the Rasch Algorithm for Design Science Research. Service-Oriented Perspectives in Design Science Research. Springer. 2010, pp. 176–191.

[15] LAPOSA, T.: E-Cohesion: How to intensify European fund management by electronic services, In: Alexander Balthasar; Blaž Golob; Hendrik Hansen; Balázs Kőnig; Robert Müller-Török; Alexander Prosser - Central and Eastern European e|Dem and e|Gov Days 2015, Budapest, 2015.

[16] LAYNE, K. and LEE, J.: Developing fully functional E-government: A four stage model. Government Information Quarterly, 18(2), 2001, p. 122–136.

[17] METTLER, T.: Maturity assessment models: a design scienceresearch approach. International Journal of Society Systems Science. 3 (1/2), 2011, p. 213–222.

[18] NEMESLAKI, A.: The theory of "IT-government" alignment: assessment and strategic fit in Hungary's case, In: Alexander Balthasar; Blaž Golob; Hendrik Hansen; Robert Müller-Török; András Nemeslaki; Johannes Pichler; Alexander Prosser - Central and Eastern European e|Dem and e|Gov Days 2016, Budapest, 2016.

[19] CARALLI, R. A. and MONTGOMERY, A.: Maturity Models 101: A Primer for Applying Maturity Models to Smart Grid Security, Resilience, and Interoperability, Carnegie Mellon University, Software Engineering Institute, Pittsburgh, 2012.

Information Security

THE LEGEND OF INFORMATION SECURITY

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Abstract
Act 50 of 2013 has served as a new and large scale impetus for both public bodies and local governments regarding information security in Hungary. This naturally means an increased need for professionals on the field. The National University of Public Services has become an institution that may very well be capable of training the required number of professionals. The aforementioned act has been amended by an implementing regulation (no. 41/2015) and as a result the system as a whole has changed regarding information security.[3] This paper aims to highlight any problems that shall be addressed and solved as quickly and swiftly as possible. Basic skills and areas that shall be improved will also be in focus as well as processes that are vital in order to realize the actual situation of information security. Without the possibility to continuously determine the actual situation and without the means to assess such situation, the probability of deterring from the right path increases. Further challenges that this area has to face actually originate from situation assessment and the determination of the "correct" path. The theoretical model (to be presented), developed during the previous years, provides quick and swift possibilities to intervene in such areas if need be. The model guarantees a way to give feedback and is able to set up a communication channel that may be used to support the whole structure on the long run in a cost efficient manner. It is capable to provide feedback from numerous areas of the system while maintaining its structure and applying clarity or additional precision where necessary. Its real advantage is that the whole system (of institutions and/or public bodies) may use it as a single institution or body would not be able to realize or develop the model in its entirety.

Key words*: information security, CISO education, information security measurement, password awareness survey.*

1. The Basis of Information Security

Information security is no other then the loose essence of knowledge in the heads of people, principles, corporate regulations, legal regulations, social and ethical norms and the network that connects such knowledge. This results in the fact that if such knowledge can be kept in sync then regulating the sharing and safety of such knowledge can also be synchronized. Such synchronized state and its continued growth may realize fundamental structural stability. Since the key is that the main area that determines information security is the knowledge that people already possess or that they will possess due to training and development, the current model in which a single person is responsible for the security of the electronic information system (namely the Information Security Officer, to be referred to as "ISO") is obsolete, especially since the law only requires such ISO to attend related training only once a year. Such models shall be reworked and improved. During the

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[3] Numbers of new degrees and regulations: No. 187 of 2015 (13. July), No. 185 of 2015 (13 of July), No. 41 of 2015 (15 of July), No. 42 of 2015 (15 of July). Some of the older regulations have been repealed. These include: No. 233 of 2013 (30 of June), No. 301 of 2013 (29 of July), No.77 of 2013 (19 of December), No. 73 of 2013 (4 of July)

research (conducted by the author, backing up this paper with its findings) information regarding the knowledge of passwords and their use was used as indicators in order to prove how much the level of consciousness towards information security can influence fundamental structural stability. The research was conducted via a questionnaire.[4] The results (in part) can be seen in the following sections.

2. Measuring the Immeasurable

Currently, in most cases the model where the level of information security regarding (an employee, or more commonly) an organizational structure is determined by a scale of five or other means that considers characterizable or typeable actions, activities or features, is considered acceptable.[5]

According to experts, the role of passwords during an authentication process is gradually going to change but they will likely be used in some form or other throughout the next decades. The expression to have a "good password" is inaccurate. Whether the password is good or not cannot be determined solely by how long or complex it is. It is also affected by numerous factors and circumstances regarding its use.[6,7] One should not say that a password is good in itself solely because it is long, complex, etc. as it may be endowed with a 100 different features. A suitable strategy or correctly regulated environment can be more effective regarding possible abuses.[8,] The attitude towards handling ones password can however correctly characterize the situation of information security.

3. Password Usage as an Indicator

Characteristics of password use is a possible indicator of information security.[9] The level of information security awareness and the general approach to this question is mostly determined by the organizational culture and in many cases it appears as a result of peer pressure within a group. (This conclusion is also backed up by the personal observations of the author, who is a lecturer of the EU Safer Internet Program and has coordinated relating activities and gave lectures by the hundreds.) Peer pressure can be just as effective in 4th grade in an elementary school[10] as it can be within an organization. Professional literature also differentiates between good and bad types of such pressure.[11]

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[4] Fundamental Stability can be understood in at least two different ways: a) every singly employee within the organizational structure is trained equally or on a high level; b) the information security component is present in each and every work process within the organization.

[5] Brotby, W. Krag, and Gary Hinson. Pragmatic Security Metrics: Applying Metametrics to Information Security. Auerbach Publications., 2013.

[6] Jelszóhasználati trendek és az ügyfélbizalom értéke. A jelszó, a bizalom és az e-befogadás összefüggései napjainkban, [in Hungarian] (Trends Regarding Password Usage and the Value of Customer Trust. Password, trust and e-acceptance in modern days II.), Papp, Gergely Zoltán – Som, Zoltán

[7] Mark Burnett: Perfect Passwords: Selection, Protection, Authentication

[8] This means that in a separate office or room even a password of five characters can be considered good if for example there are only two chances to provide it incorrectly, and upon the third failed attempt an alarm mechanism is triggered where setting back the system to default would be complicated.

[9] Herold, Rebecca. Managing an Information Security and Privacy Awareness and Training Program, Second Edition. Auerbach Publications. 2011.

[10] Based on the observations of the author in Hungarian elementary schools, regarding digital and smart devices and applications.

[11] William M Bukowski, Brett Paul Laursen, Kenneth H Rubin, Handbook of peer interactions, relationships, and groups, 2011

The relation of people towards their passwords also reflects the level of information security awareness. This is also a general characteristic of the given organization. The next examples are to serve as reason behind the above statements. Let there be a "Company A", where it is acceptable to write the passwords down and store it on a post-it ("sticky note") or in a notebook, etc. Let there be a "Company B" where it is common practice that should an employee take a leave (go on vacation or fall ill, etc.), he/she gives his/her password(s) to his/her co-workers so that they can access his/her computer, mails, etc. in his/her absence. (Please note that it is also possible that such co-workers may already be aware of such passwords as they might have been written down somewhere.) How do all of these support above statements?

- peer pressure is clearly present as everyone is doing it this way, it is accepted, even if the regulations would forbid such practice,

- it is a part of organizational culture as neither the employee(s), nor the management has developed or adopted a solution for this situation.

As a result, the attitude and care towards password usage will affect the accessibility of the information and will also have an effect on information security. This is due to the fact that one of the most fundamental principles is being ignored as it can no longer be guaranteed that the unique identifiers are only used by a single person. Throughout the interviews it became clear that the daily routine can influence the attitude and behaviour of employees regarding data access and information processing.

4. Presenting the Research

The period of data collection was between December 2014 and July 2015. Preliminary work lasted for about six months, through which previously acquired research experiences[12] were reviewed and the questions of the questionnaire have also been reviewed based on methodological, demographical and professional aspects. 58 unique links were prepared and these were made public for different groups. 1,243 people answered the questionnaires, most of which were young employees and university students. The questions can be arranged in the following blocks:

- 8 demographical questions (Question Group 1)

- 52 questions regarding passwords (Question Group 2)

- 12 questions relating to IT, ICT skills (Question Group 3)

Due to the high number of expected participants the questions were mostly multiple choice questions in order to make it possible to be processed electronically.

The research in its entirety will only be made public in the future. The most important findings can be found below.

[12] Illéssy, Miklós – Nemeslaki, András – Som, Zoltán, Elektronikus információbiztonságtudatosság a magyar közigazgatásban [in Hungarian] (Electronic Information Security Awareness in Hungarian Public Administration)

Question 2.1: How many different passwords do you use?

- 7% answered that he/she uses only one,
- 50% answered that they use a maximum of five,
- 6.4% answered that they use more than 50.[13]

According to the recommendation[14], it is advised to use a separate (unique) password for every single IT system. This would mean that should any of the passwords be compromised, no additional access would be in danger.[15]

Questions 2.2, 2.3 and 2.10: Do you have any passwords that contain a person's name? Do you have any passwords that contain a word with a meaning either in Hungarian or any in other language? Are there any words, names or expressions that are used in multiple passwords that you use?

The provided answers correspond to the previous data gathered from Hungary.[16]

- more than 1/3 answered that they use a person's name in their passwords,
- more than 2/3 answered that they use words with meanings in their passwords,
- 2/3 answered that they would use the same words for multiple passwords.
- Among those who use the rules of password creation, 1/2 use it in order to make it easier to remember where as 2/3 use it as a security measure.

Numerous researches were conducted focusing on this issue during the past years, which in most cases examined a form of algorithmic pattern in passwords and they also placed focus on predictability in possession of previous passwords upon a password change. A common mistake worth mentioning regarding these researches is that they examined the passwords "taken out of context", meaning no other factors were taken into consideration. It is an especially big problem if the new password only differs from the previous one by a few characters or if the new password "resembles" the old one after a password change.[17]

The solution is to provide an effectively supportive environment (education, training, regulation, software environment) that inspires the user to follow relating regulation and protocol without fail.

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[13] The fact that there seems to be a distinguishable layer of people who use a greater number of passwords could serve as a basis for further research. Experience shows that regarding data theft on an international level, most examination conducted focuses on easy-to-backtrack hashes, whereas a separate research may be based on cases including users who use random, long passwords consciously.

[14] NIST 800-118 recommendation, available at: http://csrc.nist.gov/publications/drafts/800-118/draft-sp800-118.pdf

[15] Som, Zoltán, Interoperabilitási kérdések és informatikai biztonsági tükrében a közigazgatásban [in Hungarian] (Questions Regarding Interoperability in the Reflection of Information Security in the Field of Public Administration) available in Hungarian at: http://real.mtak.hu/41851/7/interoperabilitasi_kerdesek.pdf

[16] Norbert Tihanyi, Comparison of two Hungarian password databases, Pollack Periodica, Vol. 8, No. 2, pp. 179–186 (2013)

[17] https://www.schneier.com/blog/archives/2016/08/frequent_passwo.html

Is the average human being really able to remember a) 10-20 or even more passwords, b) that are at least 8-10 characters long, each, c) that do not contain words with a meaning, or in other words are random, d) that are not algorithmable, e) are changed every three months, f) and are completely different from the previous one? Naturally everyone should know the answer to this question regarding themselves, but no solution is currently being made, or at least not on a scientific level. Technical solution is under development at the moment[18], and biometric authentication may also be a huge leap. It is however a long process to make every system and every single instrument compatible with such methods or to replace them by ones that are. But thinking a bit ahead, the same situation may occur by that time in the future. It is quite possible that by that time it would be possible to influence and cheat even biometric instruments and thus get around the authentication process just like it is possible to hack a password today, by countless methods. This means that no matter what the method of authentication is, whether it is "good" or not, whether it can be considered safe or secure is up to the "context", the environment it is in. And as such, the key factor is the human factor, which can be improved through education and training. It is also worth mentioning that should the level of awareness be below the level of discomfort regarding the processing and usage of the password, then the password will most likely be easily algorithmable and as a result, easy to hack, which is backed up by research.[19] This is due to the fact that such passwords do not follow the corresponding recommendations.

Question 2.11: How common is it to have a password protocol, or mandatory regulation regarding passwords on sites or software that you use?

- 25% of the answers said there usually are no such protocol.

This means that these regulation environments are not adequate or don't even exist, is weak, not noticeable or not transparent. It would be advisable to develop a recommendation that would serve as common guidelines for public and/or private participants.[20]

Questions 2. 14 - 2.17: Have you ever heard of a password safe (programs that specialize in password management)?, If you have heard of password safes, do you use them?, What are some of the good qualities of a password safe, what are the things that you like in them? Please describe it in your own words.

- 47% answered that they have heard of a password safe. 16% actually uses a password safe.

  38% of those who have heard of a password safe actually use it too.

Since we received outstanding results, we had the opportunity to analyze further related questions and factors in specific detail as based on our previous experiences regarding the research conducted in 2013, we were concerned that the answers might not have been truthful.

[18] Universal Authentication Framework

[19] Yinqian Zhang, Fabian Monrose, Michael K. Reiter: The Security of Modern Password Expiration: An Algorithmic Framework and Empirical Analysis, available at: https://www.cs.unc.edu/~reiter/papers/2010/CCS.pdf

[20] This means that both intent and knowledge are required. The case where the method of using so called "password safes", which is considered to be a good (or even best) practice among professionals is made impossible as the service provider does not allow the user to input his/her password using the copy-paste method, can be mentioned as a counterexample.

- 84% of the people who use a password safe have been using it for more than a year by the time they answered the questions, this being 13.5% of the total number of people who participated in the questionnaire.

- 6% of those who use a password safe started using it less than a year before the time of our research.

  This could hint a relatively high growth rate.

- 83% of those who use a password safe also provided comments in writing in relation of these questions.

Our goal was to implement a method of checking the truthfulness of answers, but since 83% gave valid reasons why they use a password safe, these numbers can safely be assumed to be true.

- 27% of the total of the total number of people who participated in the questionnaire answered that they are familiar with the term "password safe" but they do NOT use one.

Despite this relatively high number (of those who either heard of a password safe or actually use one), the ones who have heard of it but still do not use it still make up the majority.) Unfortunately we do not know exactly what the reasons behind this are, but we assume that the combination of the following factors play a key role: 1) ICT skills (or the lack of them), 2) Comfort/ the comforting factor of safety and 3) low level of awareness regarding possible threats.

Question 2.18: How often do you change your password(s)?

- More than 40% answered that they usually use the same password for more than a year before (if even) changing it.

This means that there is a need to change the usual behaviour of people as well.[21] This also points however at the need for a higher level regulation and a need for recommendations. This fact also means that a security risk may linger for a long period of time. Should someone acquire a password unauthorized that password may be used for months before the security breach is even found out.

Questions 2.19, 2.42, and 2.43: Do you have any passwords that is known by someone else as well, or any that you use together with someone? Have you ever revealed your password to anyone, even for a short period of time or temporarily? If you have provided your password to someone temporarily, have you changed the password once the reason was no longer viable?

- 50% answered that they have passwords that are known to others as well.

- 2/3 answered that they have shared their passwords with others before.

- 30% of those who shared their passwords with someone temporarily have not changed it afterwards.

[21] Zoltán, Som, Gergely, Papp, Hungarian Trends in Password Usage, in an International Comparison, Ceegov 2015

When a password is used by multiple people the problem arises that the identifier that is supposed to be unique and belong to a single person is used by someone else. The risk of such passwords getting in unauthorized hands is also multiplied in such cases.

Question 2.45: What do you think, are your passwords better or worse than those used by your acquaintances?

- As it can be seen below on Graph (Figure 1), almost everyone answered that their passwords are at least as good as the ones used by their acquaintances if not better. This reveals yet another problem, namely that most users don't even know that the passwords they use might not be satisfactory.

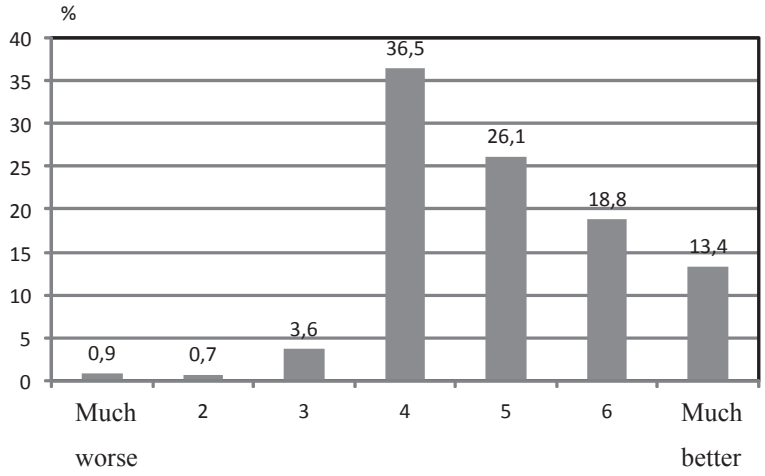

Figure 1: Question 2.45

Previously the focus was placed on circumstances, on education and training, organizational culture and peer pressure. In the following, focus shall be placed on something that helps deepen this approach. Assessing the answers briefly, the ones who provided answers wrote the following: "My password isn't any worse than passwords used by others". This supports all previous statements that the organizational structure, the culture and regulations of the given group will indeed influence individual behaviour. People tend to compare themselves to others and judge themselves based on such comparisons. If there is no related training within an organization and there is no relevant source of information on what is considered to be a "good password", then users and employees can only compare their passwords to passwords of other or to password-cultures that they now or think to be generally acceptable. This also applies to the general level of information security.

Organizational culture is extremely important. Momentary micro-decisions are based on the culture in each employees heads. Based on the personal experiences of the author the following is a common occurrence: "An easy/ quick/ short password is enough for now, I'll just change it later." This applies to numerous roles within the organization. These include the following: IT operator, user, manager, etc. Experience shows that the "I'll just change it later" part usually is often not realised.

Questions 2.47-2.48: Do you know any of your acquaintances' passwords? How did you get to know the password?

The answers are also indicated on Graph (Figure 2)

- 70% answered that they do no someone elses password.
- Fortunately in 93% of the cases the source to provide such password was the actual (original owner).

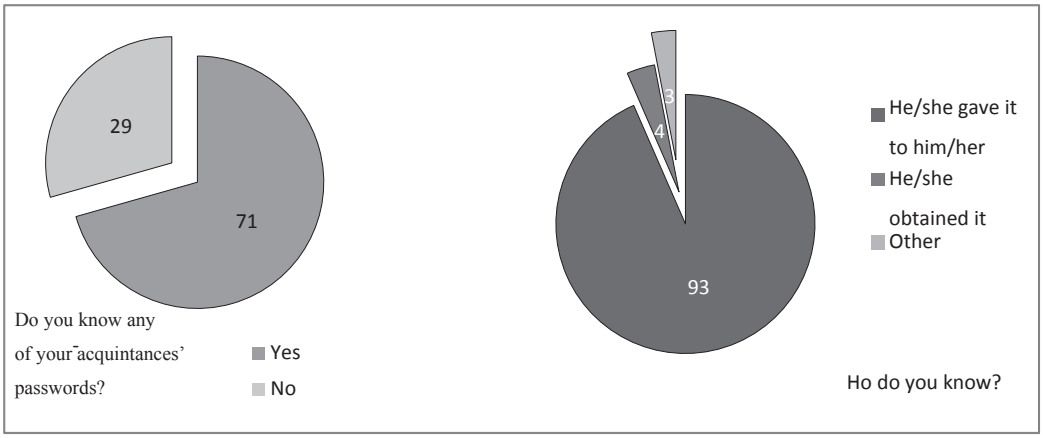

Figure 2: Questions 2.47-2.48

It is also clearly visible from the answers received to other questions not listed in this paper that expectations greatly influence the changing of passwords.[22] Usually the minimum password length required by the supplier becomes the *actual* (maximum) length of the password. This means that it is also the responsibility of the supplier to provide adequate requirements in order to minimize risks and threats and also to communicate them appropriately.

Summarizing the outcomes of the abovementioned research, the main highlights are as follows:

- it is the person who should be trained, he/she has to be provided information in possession which he/she feels supported in a situation that requires decision making,[23]
- there is a need for organized (centralized) education and training, which should be part of the National Cyber Security Strategy[24,25,26],

[22] Bruce Schneier, Choosing Secure Passwords, https://www.schneier.com/blog/archives/2014/03/choosing_secure_1.html

[23] Tipton, Harold F., and Micki Krause. "Chapter 46 - Beyond Information Security Awareness Training—It Is Time To Change the Culture". Information Security Management Handbook, Sixth Edition, Volume 1. Auerbach Publications, 2007.

[24] Som, Zoltán, Az információbiztonság oktatási kérdései: igények és lehetőségek, NKE KDI Kutatási Fórum, 2014 [in Hungarian] (Questions Regarding Information Security Trainings: Needs and Opportunities)

[25] Government Degree No. 1139 of 2013 (21 of March) on Hungary's Cyber Security Strategy, Article 10

- the training program shall be based on international good (best) practices,
- the system should be measurable and should have positive results,
- to some extent it has to be modular and customizable to fit the actual needs of the organization,
- it should support the creation of separate modules which can later be shared by other organizations,
- it should be able to effectively support the ITSec organizational system that operates on low budget and with only a small number of personnel, as well as be able to personally support the ISO.

5. The National Model of Developing Cyber-Skills

Different trends appear, others disappear and yet others strengthen within a period of a few weeks or months.[27] This means that it would be required to have a method through which even public administration would be able to quickly react to such trends (or trend changes) by reaching the masses but also staying cost effective. For this to become possible, different cyber-skills need to be strengthened. An effective support can only be provided to the organizations in question if all (multiple millions of) employees of the state (and even suppliers) can be reached by the 15-25 minute message in an early stage in order to ensure end users realize, defend against and exercise preventive measures whenever possible. *Neither regulations or law nor technology will ever be able to keep up with real life, the everyday life of an organizational structure, which means that it is only advisable to create regulations to an extent that it would not become anachronistic in a short time.[28] This also means that it is possible to realize a regulation and also to take advantage of opportunities that are presented by technology and legal regulations by developing ones knowledge.* This is one of the most important reasons why it would be necessary to set up centralized coordination on the areas of education, training and measurement.

As the biggest employer of the country, the state has yet to set up a knowledge base through the mandatory awareness training (as required by law), analyzing which would result in greatly affecting cyber-skills.

The most important characteristics of the model include:

- the possibility to notice changes relatively quickly and react accordingly,
- the possibility of rapid spread of information,
- ensuring quick reaction,

[26] Beláz, Annamária – Berzsenyi, Dániel, Kiberbiztonsági Stratégia 2.0, A kiberbiztonság stratégiai irányításának kérdései [in Hungarian] (Cyber Security Strategy 2.0, Questions Regarding the Strategic Control of Cyber Security)
[27] Numerous malicious software have a short lifespan but their effect can be quite intensive, such as in the case of: malware, ransomware, or other program-codes that specifically target a specific vulnerability.
[28] Dr. Szádeczky, Tamás, Az IT biztonság szabályozásának konfliktusa, Infokomminukáció és jog [in Hungarian] (The Conflict of IT Security Regulations, Info-Communication and Law)

- all results can be monitored accurately,
- creates culture, moulds the way of thinking,
- generates changes on systemic level,
- e.g.: should a new threat be discovered, its detection, best response to it or methods for its prevention could quickly be included in the curriculum or training materials and these could be printed and made public right away,
- training modules would be processed by organizations in a rotational system,
- as opposed to the yearly mandatory training, it is possible to share knowledge at different times,
- measurements are being made that have outcomes that may require others to react,
- different measurements may be processed based on different factors, such as demography, geo-location, organizational aspects or others,
- it may induce organizational changes within an organization,
- may induce social changes,
- it is modular, it may be assigned to a given role only, it is flexible,
- it is cost effective, as it does not require the employees to be absent from work, the given employee may schedule the training to whatever time is most suitable for him/her within the given month,
- the question bank is randomizable,
- it makes the testing of ICT skills possible, including the absence or possession of basic skills, fundamental knowledge, key terms, etc.
- it makes it possible to set up a common vocabulary of the most important key terms and also allows it to later be improved, which would result in the creation of *common definitions: cyber language*,
- measurement results can be made available on a timeline.

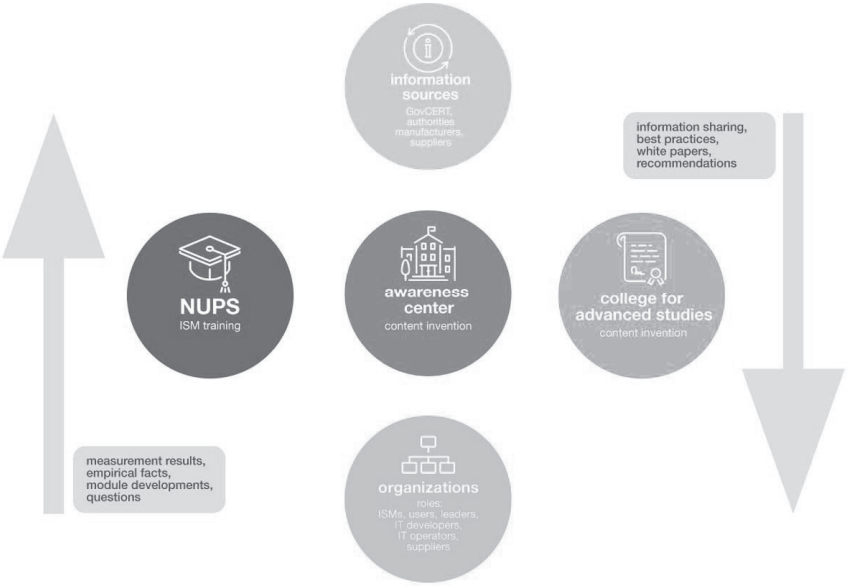

Figure 3: National Model of developing cyber-skills (hypothetical)

The model actually does more than developing information security. People that are around the age of 30 today would still be an employee for the next 30 years. Since we live in a society that is based on knowledge, it is a basic requirement that these employees would be professionally trained and be competitive. The research shows yet another interesting value, namely the high ratio of young employees and university students, which means that a training profile should be created for them as it would seem that this is an equally important question for young employees as well. Since the ICT sector accounted for 21% of the GDP growth in the EU in the last 5 years[29], it would seem that electronic authentication and trust services are literally in the interest of national economy. Regarding mid- and long terms it would open possibilities through which – through Open Data or other means – it would become possible to utilize such data as part of the national data asset. The centralized educational and training model could also serve as a good example in the future for other sectors and areas as well.

6. The Information Security Model

In today's modern society it is a structural part of our everyday lives to (continuously) use IT systems. However, most users are not aware of the (inner, structural) mechanics of the equipment they use, they mostly only come in contact with such devices as (end) users and in most cases the manufacturer also tries to keep as much of this hidden from the average user as possible. As a result a trend has seemed to emerge: Users learn to use the systems and equipment "on the go". Provided that there are no error messages displayed and the users actually succeed in whatever their objective was when they accessed the equipment in question, it is generally considered that the user is indeed capable of using such equipment (correctly).

[29] Zoltán Som, Laws aiding cyber security in the EU

The model basically (as can be seen on Graph, Figure no.3.) focuses on creating a knowledge centre that takes up a central role in developing materials that raise awareness. Once the materials are successfully developed, they would be available to all organizations covered by the scope of the corresponding regulations and also offer support in accessing and utilizing such materials. All required modifications, development, or updating as well as needs for potential new modules could be processed. The other function showed in the model (which is currently not available) would be the *professional college* of the graduates of the Information Security Leader (Chief Information Security Officer) Program on the National University of Public Services, which could gather all professionals of the field and form them into a community and provide a place for them to converse or even actively support each other.

The *main recommendation of this paper is to institutionalize the educational and training network of information security with special regard to creating and developing the centralized training of awareness in order to support public organizations.* Currently there is no specialized unit dedicated to develop or improve educational or tutoring skills within the university study program of two semesters[30]. The model aims at making the effectiveness of the training programs as well as the indicators of the level of cyber awareness measurable and also make the good and best practices catalogable.

7. Summary

In order to make developing information security possible, a relatively accurate picture is needed of the actual situation, but that alone is not enough, it should also be made possible to constantly and continuously monitor and measure changes. Following this, it would be possible to focus on different areas and "fine-tune" them based on geo-location, gender, age or organizational structure.
The model opens up numerous perspectives that are able to positively influence national cyber security and the level of awareness. In the same time, valid information is able to actively support aimed development and increase the speed of reaction to possible new threats. Information security trainings may also affect ICT skills and the situation of the economy and employment as well. It has been highlighted that peer pressure[31] and culture[32] both play an important role within an organization regarding information security awareness and the creation of fundamental stability. The method (that has been developed throughout the hundreds of lectures held by the author) could become an effective instrument that would be able to generate fundamental changes in the area in 6-18 months time.

8. References

[1] KARÁCSONYI, A.: A leadership és szervezeti kultúraés kapcsolatuk jellegzetességei a magyar szervezetek esetében, [in Hungarian] (Leadership and Organizational Culture and Characteristics of Their Relations Regarding Hungarian organizations) available in Hungarian at: http://phd.lib.uni-corvinus.hu/7/1/karacsonyi_andras.pdf

[30] National University of Public Services, Chief Information Security Officer training.
[31] N. Kollár, Katalin, Szabó, Éva, Pszichológia pedagógusoknak, (2004) [in Hungarian] (Psychology for Psychologists) available in Hungarian at:
http://www.tankonyvtar.hu/en/tartalom/tamop425/2011_0001_520_pszichologia_pedagogusoknak/ch17.html
[32] Karácsonyi, András, A leadership és szervezeti kultúraés kapcsolatuk jellegzetességei a magyar szervezetek esetében, [in Hungarian] (Leadership and Organizational Culture and Characteristics of Their Relations Regarding Hungarian organizations) available in Hungarian at: http://phd.lib.uni-corvinus.hu/7/1/karacsonyi_andras.pdf

[2] BELÁZ, BERZSENYI: Kiberbiztonsági Stratégia 2.0, A kiberbiztonság stratégiai irányításának kérdései [in Hungarian] (Cyber Security Strategy 2.0, Questions Regarding the Strategic Control of Cyber Security)

[3] BROTBY, W. K. and HINSON, G.: Pragmatic Security Metrics: Applying Metametrics to Information Security. Auerbach Publications, 2013.

[4] SCHNEIER, B.: Choosing Secure Passwords https://www.schneier.com/blog/archives/ 2014/ 03/choosing_secure_1.html

[5] Government Degree, No. 1139 of 2013 (21 of March) on Hungary's Cyber Security Strategy, Article 10.

[6] HEROLD, R.: Managing an Information Security and Privacy Awareness and Training Program, Second Edition. Auerbach Publications, 2011.

[7] ILLÉSSY, M., NEMESLAKI, A. and SOM, Z.: Elektronikus információbiztonságtudatosság a magyar közigazgatásban [in Hungarian] (Electronic Information Security Awareness in Hungarian Public Administration)

[8] BURNETT, M.: Perfect Passwords: Selection, Protection, Authentication.

[9] KOLLÁR, N.K., SZABÓ, Éva, Pszichológia pedagógusoknak, (2004) [in Hungarian] (Psychology for Psychologists) available in Hungarian at: http://www.tankonyvtar.hu/en/ tartalom/tamop425/2011_0001_520_pszichologia_pedagogusoknak/ch17.html

[10] NIST 800-118 recommendation, available at: http://csrc.nist.gov/publications/drafts/800-118/draft-sp800-118.pdf

[11] TIHANYI, N.: Comparison of two Hungarian password databases, Pollack Periodica, Vol. 8, No. 2, 2013, pp. 179–186.

[12] PAPP, G., SOM, Z.: Jelszóhasználati trendek és az ügyfélbizalom értéke. A jelszó, a bizalom és az e-befogadás összefüggései napjainkban, [in Hungarian] (Trends Regarding Password Usage and the Value of Customer Trust. Password, trust and e-acceptance in modern days II.),

[13] SZÁDECZKY, T.: Az IT biztonság szabályozásának konfliktusa, Infokomminukáció és jog [in Hungarian] (The Conflict of IT Security Regulations, Info-Communication and Law)

[14] TIPTON, H. F. and KRAUSE, M.: "Chapter 46 - Beyond Information Security Awareness Training—It Is Time To Change the Culture". Information Security Management Handbook, Sixth Edition, Volume 1. Auerbach Publications, 2007.

[15] BUKOWSKI, W.M.: Brett Paul Laursen, Kenneth H Rubin, Handbook of peer interactions, relationships, and groups, 2011.

[16] ZHANG, Y.: Fabian Monrose, Michael K. Reiter: The Security of Modern Password Expiration: An Algorithmic Framework and Empirical Analysis, available at: https://www. cs.unc. edu/~reiter/papers/2010/CCS.pdf

[17] SOM Z.: Laws aiding cyber security in the EU.

[18] SOM, Z.: Az információbiztonság oktatási kérdései: igények és lehetőségek, NKE KDI Kutatási Fórum, 2014 [in Hungarian] (Questions Regarding Information Security Trainings: Needs and Opportunities).

[19] SOM, Z.: Interoperabilitási kérdések és informatikai biztonsági tükrében a közigazgatásban [in Hungarian] (Questions Regarding Interoperability in the Reflection of Information Security in the Field of Public Administration) available in Hungarian at: http://real.mtak.hu/41851/7/interoperabilitasi_kerdesek.pdf

[20] SOM, Z., Gergely, Papp, Hungarian Trends in Password Usage, in an International Comparison, Ceegov, 2015.

METHODOLOGY AND ALGORITHM OF INFORMATION SECURITY RISK MANAGEMENT FOR LOCAL INFRASTRUCTURE

Bulai Rodica, Ciorbă Dumitru, Poștaru Andrei and Rostislav Călin[1]

Abstract

The complexity of information security does not resume to mere technicality, transferring significant liability to proper management. Risk analysis in information security is a powerful tool that comes in handy for managers in making decisions about the implementation of efficient information management systems, in order to achieve the organization's mission.

As a part of risk management, risk analysis is the systematic implementation of methods, techniques and management practices to assess the context, identify, analyze, evaluate, treat, monitor and communicate the risks for the information security and systems through which they are processed, stored or transmitted.

The ISO/IEC 27005:2011 – Information security risk management, does not specify any particular method for managing the risks associated with information security, but a general approach. It is up to the organization to devise control objectives that would reflect specific approaches to risk management and the degree of assurance required.

There are several models, methodologies and tools amongst which those like CRAMM (United Kingdom, Insight Consulting), Risicare/Mehari (France, Clusif), GSTool (Germany, IT-Grundschutz). The theoretical model of the mentioned methodologies is hard to put in practice without experience required from the members of the risk analysis team. Using the appropriate risk assessment solution, an organization can devise its own security requirements.

1. Introduction

In an *information era*, we cannot and must not ignore the factors that can have a negative influence on the smooth running of daily activities of the society. In each of our daily activities, we operate with information, which has different sensitivity levels depending on the damage its compromising can cause on the individual or organization to which it belongs.

The organizations, no matter of which type, have begun to realize more and more the essential role of information in fulfilling their objectives. The growing tendency of globalization and internationalization of the economy requires a constant exchange of information with other organizations and agencies in order to obtain the necessary managerial knowledge to ensure competitiveness and efficiency.

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Certainly, the increasing importance of this resource led to a proportional escalation of potential threat to it, also a favored fact by vulnerabilities presented by the systems through which the information is managed.

In order to establish coherent, efficient and effective information protection measures, the information security management has become an integral part of organizational management, whether it refers to governmental, private and international organizations.

In this regard, the security level to be targeted for information must be in full correspondence with the value of information and the damage that its misuse may cause - disclosure, degradation or lack of availability.

At the same time, security measures must take into account the operational environment vulnerabilities and the threat environment, justifying the application of a measures complex. This demonstrates that the costs of providing protection against threats to information increase with threats and vulnerabilities rise, therefore, it requires a reasoned justification.

2. Information Risks Management

At local level, decisions on information security risks management within organizations, most often, are insufficiently substantiated, sometimes ad hoc, empirical, correction oriented, and therefore inadequate in terms of safety and inefficient in terms of cost. This practice leads to negative effects, including:

- Confidentiality, integrity and availability affecting, if the implemented security systems are not designed to cope with possible threats;

- The allocation of oversized budgets for information security;

- The decrease of employees work performance through the implementation of inefficiently designed security systems, that lead to impaired of information availability, resources and services of information and communication systems within the organization;

- The necessity of taking decision to remedy the effects of an incident affecting information security by implementation of punctual corrective measures, which are more expensive and less effective than if preventive measures had been implemented from the start.

The information security risk analysis represents a powerful tool that managers have in the decision-making process in order to implement efficient information management systems and, ultimately, to fulfill the organization's mission. As part of risk management process, the risk analysis represents the systematic implementation of methods, techniques and management practices for context evaluation, identification, analysis, valuation, treatment, monitoring and communicating risks regarding information security and systems, by which these are processed, stored or transmitted.

To be efficient and effective, the risk analysis of information security must be an integral part of risk management carried out by the organization for its entire range of activities and therefor, objectives. The fluid nature of technological environment requires, however, the need to review the results of the information security risk analysis through regular reruns of this process. Various qualitative and quantitative risk analysis methods have been developed in this direction, the purpose of which is to analyze as accurately as possible the risks the organization's information is exposed to.

Another element that must characterize risk analysis process is that the process must be extended throughout the life cycle of a business, project, product or any other asset that may be affected by the compromising of information managed across the organization. Applying risk analysis at the planning stage of an information management system leads to significant benefits like reduction of development costs, functionality and integration improvement, as well as raising the awareness of possible risks and the countermeasures to be applied for their management.

3. Information security risk management methodology

For this purpose, we intend to recommend a modern methodology of information security risk management, which would positively influence the way managerial decisions are made, whatever the type of organization is. In addition, it has to provide objective arguments for decision making in the identification of internal and external risk factors regarding information managed by the organization, as well as the threat factors trends. The methodology must directly support the efficient and effective use of human, material, financial and information resources of that organization, based on appropriate risk analysis that may have an impact on the security of information handled by the organization.
The proposed methodology is based on the analysis made on the current and well-known standards and methodologies, such as NIST 800-30, ISO / IEC 27005: 2011, AS / NZS ISO 31000: 2009, Mehari, CRAMM, BSI-Standard 100-3 (IT -Grundschutz), as shown in table 1. It contains nine basic steps.

NIST 800-30[1]	**ISO/IEC 27005:2011**[2]	**AS/NZS ISO 31000:2009** [3]	**BSI-Standard 100-3** [4], **IT-Grundschutz** [5]	**MEHARI** [6]	**CRAMM** [7]
National Institute of Standards and Technology, USA	*Information security risk management standard*	*Joint Australian New Zealand International Standard*	*Federal Office for Information Security – BSI), Germany*	*Clusif, France*	*Insight Consulting United Kingdom*
System Characterization	Context establishment	Establishing the context (external, internal, risk criteria)	Preliminary work	Identification of the risk - assets, vulnerabilities, asset damage, threats	Identification and valuation of assets
Threat Identification	Information security risk assessment	Risk assessment	Preparing the threat summary	Impact evaluation	Risk identification and assessment
Vulnerability Identification	*Risk identification* (assets, threats, existing controls, vulnerabilities, consequences)	*Risk identification*	Determination of additional threats	Constraint evaluation	*Threat and vulnerability assessment*
Control Analysis (current and planned)	*Risk analysis* (Qualitative and Quantitative)	*Risk analysis*	Threat assessment	Evaluation of the protection factors – palliative and recovery	*Risk calculation* (Qualitative)
Likelihood Determination	*Risk evaluation*	*Risk evaluation*	Handling risks	Evaluation of the probability - the possible risks are evaluated	Risk Management identification and selection of countermeasures
Impact Analysis (Integrity, Availability, Confidentiality)	Information security risk treatment	Risk treatment (Preparing and implementing risk treatment plans)	Consolidation of the security concept	Impact evaluation, not considering the countermeasures taken	
Risk Determination	Information security risk acceptance	Monitoring and review	Feedback to the security process	Impact evaluation after countermeasures	
Control Recommendations	Information security risk communication and consultation	Recording the risk management process		Identification of the global risks for the organization	
Results Documentation	Information security risk monitoring and review			Taking the decisions to accept the risk or not	

Table 1. Comparison of processes of Information security risk assessment

3.1 Getting the support of the administration

The success of the risk management and analysis depends greatly on the level of involvement and support of top management. Namely, the top management is responsible for initiating the process,

activities coordination and ensuring the reporting in sufficient time. Although its involvement may not be direct, the support of management is essential. Specific tasks of the top management in the process of risk analysis can be:

- Selection and appointment of the team, including the team leader;
- Delegation of authority and responsibility for this task;
- Review and support of the obtained results;
- The final decision making regarding the implementation of certain security measures.

The team leader should be involved in selecting the team members and draw up the plan to perform the necessary activities and to ensure that they will be made in due time. He will also coordinate the preparation of reports for the top management. The number of team members can vary, depending on the size of the organization, however it is advisable to have not less than three, or at least one representative of each subdivision that actively use information resources. The team members must be carefully selected, ensuring their competence in the business processes that take place within the subdivisions they belong to and the way these processes depend on information technologies.

3.2 Description of the organization's information infrastructure

At this stage, information resources and their interdependence are identified (e.g. what system, what data does it manage, what technologies are used, where it is located and whom is it managed by). The limits of the system are determined and a description of the hierarchical information infrastructure of the organization is made in order to easier identify the possible vulnerabilities and define the level of protection provided by the existing control measures.

Information resources are considered here to be:

1. *Information* – information stored electronically and on paper: system and process procedures, work instructions, regulations, system documentation, design documentation, contracts and agreements, financial and accounting documents, personnel files etc.;
2. *Hardware* – server equipment, network equipment, workstations, printers, mobile/media devices, physical security equipment;
3. *Software* – *t*he organization's subsystems and applications, database servers, application servers, portals and Web services;
4. *Personnel* – internal staff and third parties personnel involved in the contractual relationship;
5. *Location and facilities* – premises infrastructure, fixed assets, services and facilities;
6. *Organizational* – contracts / projects in progress, enterprise reputation and image, web site.

Resources are classified in terms of information:

P = Public; *R = Restricted (internal use);* *C = Confidential*

It also suggested to group the resources (e.g.: workstation, printer, documentation) and to record the information on the person responsible for each identified resource.

The owner is not necessarily the resource user, e.g.: the resource "workstation", which is a single heading in the classification of resources, designating all workstations that are exposed to the same type of threats and vulnerabilities, can stand for all the workstations in a department, or on the same floor or a location. In this case, the owner can be the head of the department, the IT manager etc. and not users.

The risks owner is established for each category of resources. It can be the organization administrator or a person nominated by him (subdivision chief, manager or coordinator). The result of this phase may be a list (or multiple lists, for each category separately) with all information resources identified within the organization.

3.3 Information resources classification

It is needed to determine the priorities for their protection. Resource classification criteria are established taking into account the criticality level, the impact of resource unavailability, the cost of resource fail, confidentiality, integrity and availability fail, etc. The classification of resources should take into account the interdependencies between them. The number of resources in each category is arbitrary, but it is preferable to limit the number of critical resources to avoid confusion. The result of this phase is the classification of priority information resources in terms of their level of criticality.

- *Critical resources* – resource owning organization or subdivision cannot continue working without that resource.

- *Essential resources* – resource owning organization or subdivision can continue working, but for a specified period of time (hours or days), so the resource has necessarily to be restored.

- *Normal resources* – resource owning organization or subdivision may continue working for a long time, however, some people will be partially affected, being forced to find alternative.

A method for the identification and ranking of critical resources by team members is presented in Table 2.

RESOURCE LIST									
No.	Resource type	Resource category	Resource code	Resource	Classification	Owner	Location	Value	Description

Table 2: Resource list

3.4 Threats and vulnerability identification

The purpose of this step is to determine potential sources of threats and vulnerabilities for the analyzed IT infrastructure. Based on History of system attack, Data from intelligence agencies, mass media etc., the threats to an organization's information security can be identified and have different dimensions:

- **Of human nature:** *deliberate actions* (e.g.: unauthorized access to data and system, DOS/DDOS, traffic interception/modification, malicious code/software, data or equipment theft or destruction, social engineering, etc.) and accidents – operating errors.

- **Of technical nature -** power outage, equipment failure, etc.

- **Environment -** natural disasters or other external conditions (e.g.: contamination, electromagnetic interference).

Vulnerability identification sources can be: Previous risk assessment documentation of the IT system assessed, The IT system's audit reports, system anomaly reports, security review reports, and system test and evaluation reports, Vulnerability lists or database, Incident Advisory Capability bulletins, Vendor advisories, Commercial computer incident/emergency response teams and post lists, Information Assurance Vulnerability Alerts, System software security analyses, Automated vulnerability scanning tool, Security test and evaluation, Penetration testing.

The threats and vulnerabilities should be identified separately for each resource and included in the list of threats and vulnerabilities, Table 3. This list will be reviewed annually or after some unforeseen security incidents. Existing means of protection implemented by the company are also considered.

List of threats and vulnerabilities		Means of protection
Vulnerabilities	Threats	
INFORMATION		
HARDWARE		
SOFTWARE		
PERSONNEL		
LOCATION and FACILITIES		
ORGANIZATIONAL		

Table 3: Threats and vulnerabilities list

3.5 Determining the impact and probability of risk information

At this stage the probability of a security incident is analyzed, which depends on threats, vulnerabilities and existing security measures set out in the previous step.

The impact and probability of each threat and vulnerability is quantified as follows.

Probability value:

1 = *low* - the occurrence of an incident within three years is unlikely;

2 = *medium* - the effects can occur within two or three years;

3 = *high* - likelihood of one or more incidents a year.

For risks associated with the location of the organization (terrorism, social unrest, natural disasters) incidents in the area of the locality are taken into account.

The impact value is determined, at least in the first iteration, based on the same considerations as in the case of establishing the resource value [8].

Impact value:

1 = *normal* - the impact on the confidentiality, integrity and availability of the normal resources is insignificant for the organization, no additional protection measures are required (e.g.: data about company structure);

2 = *essential* - the impact on the confidentiality, integrity and availability of critical media may damage the organization (e.g.: commercial data, data about orders etc.);

3 = *critical* - the impact on the confidentiality, integrity and availability of critical resources can cause great or even catastrophic damage for the organization (e.g.: the confidential documents of the organization).

3.6 Information risk assessment

This step consists of two approaches: qualitative and quantitative. The approaches are different in the metrics they use.

Qualitative risk assessment is based on the analysis of various scenarios that explore the impact of various potential and possible security incidents through a number of interconnected elements: threats, vulnerabilities and resources. Thus, the risk can be determined as: $R=R_{esource\_value}*V_{ulnerability}*T_{hreat}$.

It is also necessary to take into account several important assumptions for qualitative estimation of information risks, namely:

1. Each asset has its value and every asset is vulnerable or not;

2. If a system is vulnerable, there is at least a threat that can be achieved (threats and vulnerabilities depend on each other);

3. A threat has a certain probability of being achieved, depending on certain circumstances;

4. A threat has consequences that depend on the circumstances.

Based on the above assumptions, the risk can be calculated using the following formula:

$R=P_{robability}*I_{mpact}$, table 4.

Information risk	Probability	1	2	3
Impact (consequence)	1	1	2	3
	2	2	4	6
	3	3	6	9

Table 4: Information risk assessment

The risk hierarchy will be used to identify risk-handling options:

1-3: Minor: Maintain the existing security means
4-6: Significant: Planned corrective actions
7-9: Major: Priority corrective actions

Table 5: Information risk hierarchy

Risks that are considered insignificant have to be removed from the list. Risks should be explicitly identified in relation to one or more resources.

The quantitative approach uses two basic elements, namely the probability that a certain event will occur and the loss associated with this event.

It is recommended that losses to be estimated for a period of one year, so the following can determined:

- Estimated Annual Losses summed by categories of threats: (*EAL_a$_i$*),
- Estimated Annual Losses summed by categories of resources: (*EAL_r$_j$*), and
- Total Estimated Annual Losses Estimate for resource/threat pairs: *EAL*.

In both cases the calculation of total losses, by category of threats or categories of resources, the result should be identical. Thus, we can generate a threats/resources matrix that will contain the corresponding EALs for each resource, and respectively, each threat, and the global EAL:

	Resource r_1	**Resource r_2**	**…**	**Resource r_n**	**EAL_a_i**
Threat a_1	V_1xE_1	V_2xE_1	…	V_nxE_1	EAL_a_1
Threat A_2	V_1xE_2	V_2xE_2	…	V_nxE_2	EAL_a_2
…	…	…	…	…	…
Threat a_m	V_1xE_m	V_2xE_m	…	V_nxE_m	EAL_a_m
EAL_r_j	EAL_r_1	EAL_r_2	…	EAL_r_n	**∑ EAL**

Table 6: Threats/resources matrix

In this matrix, V_j is the value of the r_j resource, and E_i - the frequency of the a_i threat occurrence during a year.

Measures that can reduce vulnerability to the most expensive threat are identified. It is always envisaged that some measures can be applied for several categories of threats or for several categories of resources. The following objectives must be taken into account when selecting the protective measures:

- Return On Investment must be as high as possible: *ROI* = *r_c*EAL_a–C_c*, where *C_c* = annual cost for using the measure c, *r_c* = the effectiveness index for the measure c and *EAL_a* = Estimated Annual Losses for threat a.
- Minimizing of *EAL* (Estimated Annual Losses) [9].

3.7 Drawing up of information risk treatment recommendations

This phase aims at reducing the level of risk within the organization. For the risks placed in *Major* and *Significant* categories there are identified control means, helping to reduce, redirect or eliminate these risks. In this context, it is recommended to:

- Identify and document every solution that can be implemented. The solutions can be technical, manual or procedural. At this phase, it may be obvious that there is a single solution. In this case, it is necessary to argument why other solutions are impossible to accept;

- Justify each proposed solution. The obvious argument is problem solving, but it could happen that a certain solution can solve several problems simultaneously, fact that must be necessarily mentioned;

- Make a costs/benefits analysis for each proposed solution, including direct costs, staff training costs and future operational costs. In case of necessity, competent specialists within the organization can be consulted;

- Propose an implementation plan for the identified solution. The plan must take into account the priority of the resource and the impact the analyzed risk can have.

It is advisable to identify more solutions for removing the same risk, in this case the priority being given to solutions that enable the removal of a group of risks for a resource or group of resources.

After applying the selected measures, the new values of probability and impact are estimated, and the amount of residual risk is calculated. The owner of risk will approve the residual risk, Table 6. This table is filled in for each resource separately in accordance with the classification of resources and threats and vulnerabilities list.

No.	RISK ASSESSMENT AND SELECTION OF SECURITY MEASURES								
	RESOURCE TYPE: _____								
	Resource code: _____		Resource: _____						
	Vulnerabilities	Threats	Probability (Before the control mechanism)	Impact (Before the control mechanism)	Risk	Reduction/control mechanism	Probability (After the control mechanism)	Impact (After the control mechanism)	Residual risk

Table 7: Risk list

It is recommended to select control measures by Annex A of ISO / IEC 27001: 2013 and develop the risk treatment plan in accordance with the form of risk treatment plan, Table 7. This table is filled in for each type of resource separately, in accordance with the risk list.

No.	RISK TREATMENT PLAN								
	RESOURCE TYPE: _____								
	Vulnerabilities	Threats	Reduction/control mechanism	Objectives	Security measure	Responsible	Date	Resources needed	Achievement

Table 8: Risk treatment plan

The forms that are completed and coordinated with officers involved are included in a final report and addressed to the top management for the final decisions.

3.8 Results Documentation

After completing risk analysis (threats and vulnerabilities are identified, the risks are analyzed, and control means are recommended) it is required to make an official report or some brief instructions.

The report for the top management should contain:

- General information about the team involved (team leader, team members) and the analysis period;
- General comments on the information infrastructure, business processes that are supported by IT processes;
- The list of information resources in descending order of priorities (from the highest to the lowest);
- Informational risks;
- List of risks associated to information resources and means of protection;
- Risk treatment plan, etc.

The final report has to be discussed at the team meeting for the final consultations among team members and the necessary changes can be made. The last version, signed by all team members, is sent to the top management.

Finally, the success of a risk analysis depends on the involvement of the top management. The role of management, in addition to initiating the process, create the team and delegate responsibilities, is to analyze and support the results and proposals made during the risk analysis. The team leader should regularly inform the senior management about the progress and success of completing the risk treatment plan. This way a greater degree of involvement of top management and financial support for the implementation of the suggested solutions will be ensured. The final verdict on the solution to be implemented for each of the identified risks belongs obviously to the top management, but that should not be done without consulting the team. The implemented solution is going to be, most probably, not the most efficient, but it should be the best in terms of cost/benefit.

3.9 Information risk monitoring

This last phase target is to check that:

- risk responses are implemented according to the plan and produce the expected effect;
- symptoms for known risks can be detected;
- new threats and vulnerabilities are tracked, the appearance of identified risks and the detection of previously unidentified risks, but acting on the organization's activities;
- risk response plans and their performance assessment can be executed;
- risk management procedures are followed;
- residual risk for known risks can be determined;
- proposed contingency plans can be implemented;
- new alternative responses can be found;
- the required corrective and re-planning actions can be carried out.

For risk monitoring, it is necessary carefully to measure technical performance for symptoms, regularly rerun qualitative and/or quantitative risk analysis and document any response to risk so that it can be easily used. It is also very important to inform those involved in symptoms and new risks identification about all the changes caused by responses to those risks and resumption of risk management activities: identification, analysis, and response plans preparation.

4. Conclusion

By Government Decision nr. 811 from 11.29.15 (Official Monitor nr.306-310 art.905) was adopted The National Program for Cyber Security of Moldova Republic for 2016-2020, which is oriented towards the implementation of four key components, namely:

1) Introduction of minimum mandatory requirements of cyber security and cyber security national standards for the processing, storage, transmission, storing and secure data access;

2) Certification and authorization of specialists and information systems according to the approved standards;

3) *Cyber security periodical conducting audit of information systems and electronic communications networks* within public authorities and other entities possessing information systems of vital importance to society;

4) Introduction of prescriptions and penalties for non-compliance the minimum-security requirements and national standards in the field.

In February the current year, the Government of Moldova adopted the mandatory minimum requirements of cyber- security.

In the context of the above, we consider that management and risk analysis is required to be approached not as a project activity (finite time) but as an ongoing process. The proposed practical method can be a good start for this process, for the organizations of Moldova Republic, where the information risks are addressed more intuitive on operational level, further activities being necessary for monitoring the implementation of the solutions selected and the developments taking place after.

The existence of a strategic planning that would be based on an analysis of identified risks to the information managed by the organization, will increase the safety culture in organizations in the country, both within the state and the private ones, regarding specific cyber threats and vulnerabilities, which can negatively impact the vehicle information and therefore, on the interests of the organization.

5. References

[1] Guide for Conducting Risk Assessments. National Institute of Standards and Technology. http://nvlpubs.nist.gov/nistpubs/Legacy/SP/nistspecialpublication800-30r1.pdf

[2] ISO/IEC 27005:2011. Информационная технология - Методы и средства обеспечения безопасности – Менеджмент риска информационной безопасности. https://exebit.files.wordpress.com/2013/11/iso-27005-2011-ru-v1.pdf

[3] Joint Australian New Zealand International Standard AS/NZS ISO 31000:2009. Risk management – Principles and guidelines. http://www.risknz.org.nz/files/2714/0868/4677/31000.pdf

[4] BSI-Standard 100-3 Risik analysis based in IT-Grundschutz https://www.bsi.bund.de/SharedDocs/Downloads/EN/BSI/Publications/BSIStandards/standard_1003_e_pdf.pdf?__blob=publicationFile

[5] BSI-Standard 100-2 IT-Grundschutz Methodology https://www.bsi.bund.de/SharedDocs/Downloads/EN/BSI/Publications/BSIStandards/standard_1002_e_pdf.pdf?__blob=publicationFile

[6] Mehari. Privire genrala. http://meharipedia.org/wp-content/uploads/2016/12/CLUSIF-2010-Privire-generala-MEHARI.pdf

[7] www.cramm.com

[8] The Security Risk Management Guide, Microsoft Solutions for Security and Compliance and Microsoft Security Center of Excellence, http://trygstad.rice.iit.edu:8000/Books/TheSecurityRiskManagementGuide-Microsoft.pdf

[9] BULAI RODICA, Estimarea cantitativă şi calitativă a riscurilor informaționale, Conferința internațională *Securitatea Informațională 2013*, ASEM, Chişinău, 2013, http://security.ase.md/materials/publications/pdf/SI2013_conference_book.pdf

INDIVIDUAL AWARENESS OF CYBER-SECURITY VULNERABILITY – CITIZEN AND PUBLIC SERVANT

Krisztina Győrffy[1], Ferenc Leitold[2] and Anthony Arrott[3]

Abstract
Cyber-security is not concerned so much with average or median vulnerability in an organization. Rather more important is identifying the weakest links. Individual user susceptibility and user behaviour risk assessment are key to measuring the effectiveness of cyber-security awareness programs and policies. Increasingly, it has been demonstrated that managing individual user susceptibility is as critical to organization well-being as maintaining patched IT infrastructure or responding to specific immediate cyber-threat alerts.

Despite IT systems audits, human factor studies, training courses, user policies, and user documentation, managing user cyber-security awareness remains one of the weakest links in protecting organizations from cyber-threats. Most employees are not aware of the cyber-threats they are most likely to encounter while performing their work. They are susceptible to malicious manipulation (social engineering threats) and they tend not to follow standard procedures (either through ignorance or in attempting to circumvent security procedures to achieve more productivity). Typically, employees only recognize the importance of cyber-security policies and practices after an incident has happened to themselves.

With the increasing availability and utility of IT network traffic analysis tools and active user behaviour probes (e.g., fake-phishing), employees can be given direct and individual feedback to increase their cyber-security awareness and improve their cyber-security practices. Beyond an organization's employees, the same holds for a country's citizens, or a government's public servants. At their best, these user behaviour monitoring tools can be used in an open and transparent way to increase awareness of individual vulnerability before actual incidents occur.

In addition to presenting results from the application of user behaviour monitoring tools to cyber-security, this paper examines the efficacy of the privacy protection safeguards that they incorporate. These results are applied to public sector approaches to: (a) public awareness of citizen cyber-health; (b) securing online pubic services; and (c) public servant awareness of their own vulnerability to cyber-threats.

Key words: *cybersecurity user behaviour, cyber-security user awareness, user behaviour monitoring tools, IT network traffic analysis.*

1. Introduction

At some level, all software processes are incompletely autonomous and require some degree of human decision-making to effectively perform useful work in information processing. Well-designed software user interfaces provide the human decision-maker with logic, context, and

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guidance which make the necessary human decisions easier and more reliably successful. However, residual risk always remains that cannot be completely eliminated as a hazard in the human decision-making process.

We can associate the best that software support of human decision-making can provide with full facilitation of what may be referred to as first-order learning about the software process by the user. Similarly, we can associate the concept of second-order learning as support for the user's judgement that is inherently beyond what the autonomous software application can provide [1].

When applied to natural hazards, such as circumstantial disruptions of software processes or accidents and mistakes of judgement by users, the second-order learning required to mitigate risk can be achieved using well-established concepts and techniques of risk communication and risk education [2]. However, when the hazards involve malicious intent, the entire first-order learning support system is susceptible to wholesale subversion. Malicious actor knowledge of the guileless software user interfaces and the predictable behaviors of even well-trained users give rise to vulnerabilities at the software user interface. Malicious exploitation of these vulnerabilities are referred to as malicious social engineering attacks [3,4] Consequently, the vulnerability of software users to social engineering attacks requires additional considerations for effective risk communication and risk education [5].

Effective mitigation of user susceptibility to social engineering requires active engagement of the users themselves in their own cyber-defense. Strong motivators for user responsibility and competence in cybersecurity include:

- business-context phishing emails remain the most difficult for users to recognize.
- top emotional motivators: curiosity, fear, urgency.
- susceptibility to phishing email drops almost 20% after just one failed simulation.
- reporting rates significantly outweigh susceptibility rates when simple reporting is deployed to more than 80% of a company's population, even in the first year
- active reporting of phishing email threats can reduce the standard time for detection of a breach to 1.2 hours on average—a significant improvement over the current industry average of 146 days. [6].

Government cybersecurity strategies and directives have emphasized the need for cybersecurity awareness and training for both public servants and private citizens [7,8,9]. Despite IT systems audits, human factor studies, training courses, user policies, and user documentation, managing user cyber-security awareness remains one of the weakest links in protecting organizations from cyber-threats. Most employees are not aware of the cyber-threats they are most likely to encounter while performing their work. They are susceptible to malicious manipulation (social engineering threats) and they tend not to follow standard procedures (either through ignorance or in attempting to circumvent security procedures to achieve more productivity). Typically, employees only recognize the importance of cyber-security policies and practices after an incident has happened to themselves.

With the increasing availability and utility of IT network traffic analysis tools and active user behaviour probes (e.g., fake-phishing), employees can be given direct and individual feedback to increase their cyber-security awareness and improve their cyber-security practices. Beyond an organization's employees, the same holds for a country's citizens, or a government's public servants. At their best, these user behaviour monitoring tools can be used in an open and transparent way to increase awareness of individual vulnerability before actual incidents occur.

2. Public awareness of citizen cyber-health

2.1 The correlations between government rules and human behaviour

In the Financial Times in the USA young directors can be concerned about tackling the problem of cyber security. [10]; while on the other side of the World in December 7, 2015, the European Parliament and the Luxembourg Presidency of the Council of the European Union (EU) reached an agreement on common rules to strengthen network and information security across the EU. It unveiled the proposed Network and Information Security Directive, the "NIS Directive". The "NIS Directive" constitutes the first and essential step for the development of an EU harmonized framework for cybersecurity. Earlier the United Kingdom (UK) Cyber Security Strategy was published in November 2011 and later in February 2012 the Government Regulation about the Hungary National Security Strategy was published in Hungary. [8]

It is real information, because it is proven that information systems used with the introduction of safety measures can reduce the number of cyber-incidents. However, with the ongoing increased introduction of rules available to mitigate identified risk you cannot reach an adequate level of reduction in cyber-attacks or loss of data. Junior directors, government's public servants or other country's citizens make important decisions without a depth and breadth of knowledge and experience across the area of information assurance. These mean real dangers and high degree of risk factors in the cyber-security landscape.

Due to the ability of the media and the research community to support a level of single focus, you can try to diagnose the cyber illness and measure the level of the awareness of cyber-security.
Nowadays the younger generation believe that cyber-security risk or the awareness of the cyber-security and the security cyber-regulations is new fashion in the world, and this issue solely is the problem of the security society. In this case security expects advice on the scale of the cyber threat, the risks that need to be considered by everyone at all times.
It is the great risk that the younger generation use the Internet and the different cyber-applications with self-confidence. By using the cyber without control the human obsession will take the dangerous way. In this event the cyber-device causes addiction and health damage for the citizens. Health damage is the cyber headache, dry eyes, vision deteriorations, tenosynovitis and musculoskeletal complaints or even psychiatric cases. In Hungary the Labour Code was released for the computer work in 2012 which says that the employer is obliged to organize the workflow so that continuous work hours for at least 10 minutes before the screen should be interrupted and actual work before the screen shall not exceed six hours daily.

2.2 Modern awareness security

The professional security societies such as Cyber-Security organisations in United States of America [13] [14] or the United Kingdom Cyber Essentials draw attention to the risks and publish topics of Cyber Security Controls.

The next table presents the topics of security instructions for the citizens or security experts by Cyber-Security institutes [15] such as Centre for Internet Security. [14]

Top 10 2013-A6-Sensitive Data Exposure

2013 Table of Contents

← A5-Security Misconfiguration | 2013 Top 10 List | A7-Missing Function Level Access Control →

Threat Agents	Attack Vectors	Security Weakness		Technical Impacts	Business Impacts
Application Specific	Exploitability DIFFICULT	Prevalence UNCOMMON	Detectability AVERAGE	Impact SEVERE	Application / Business Specific
Consider who can gain access to your sensitive data and any backups of that data. This includes the data at rest, in transit, and even in your customers' browsers. Include both external and internal threats.	Attackers typically don't break crypto directly. They break something else, such as steal keys, do man-in-the-middle attacks, or steal clear text data off the server, while in transit, or from the user's browser.	The most common flaw is simply not encrypting sensitive data. When crypto is employed, weak key generation and management, and weak algorithm usage is common, particularly weak password hashing techniques. Browser weaknesses are very common and easy to detect, but hard to exploit on a large scale. External attackers have difficulty detecting server side flaws due to limited access and they are also usually hard to exploit.		Failure frequently compromises all data that should have been protected. Typically, this information includes sensitive data such as health records, credentials, personal data, credit cards, etc.	Consider the business value of the lost data and impact to your reputation. What is your legal liability if this data is exposed? Also consider the damage to your reputation.

Am I Vulnerable To 'Sensitive Data Exposure'?

The first thing you have to determine is which data is sensitive enough to require extra protection. For example, passwords, credit card numbers, health records, and personal information should be protected. For all such data:

How Do I Prevent 'Sensitive Data Exposure'?

The full perils of unsafe cryptography, SSL usage, and data protection are well beyond the scope of the Top 10. That said, for all sensitive data, do all of the following, at a minimum:

Table 1: in 2013 table of controls, Top 10 Sensitive Data Exposure by The Open Web Application Security Project, not-for-profit charitable organization in the United States of America

However, the security experts or the citizens with behavior of modern awareness security know the top controls (Table 1 and Table 2) even if they don't follow the instructions, but analyze who is the person without awareness of cyber-security. On the base of the observation and of the information security research we can diagnose that the citizen without awareness of cyber-security is indeed insecure in the cyber-world. Such citizens can't securely use cyber applications and cyber devices. They are the citizens who are frightened by the notice on the screen and don't notice the cyber-incident or virus infection.

Top 5 CIS Controls

- CSC 1: Inventory of Authorized and Unauthorized Devices.
- CSC 2: Inventory of Authorized and Unauthorized Software.
- CSC 3: Secure Configurations for Hardware and Software on Mobile Devices, Laptops, Workstations and Servers.

3.1 Establish standard secure configurations of your operating systems and software applications. Standardized images should represent hardened versions of the underlying operating system and the applications installed on the system. These images should be validated and refreshed on a regular basis to update their security configuration in light of recent vulnerabilities and attack vectors.

Table 2: Top 5 controls for security expects, Center for Internet Security in the USA, New York

The next chapter presents a few instructions that the official Twelve Step groups or organizations shall follow [16] concerning what the citizens can do when cyber-incidents emerge.

3. Securing online pubic services

3.1 Online helpdesk

This charter presents the twelve steps from the 12step.org portal that helps the citizen with or without awareness cyber-security in the cyber-work all time.

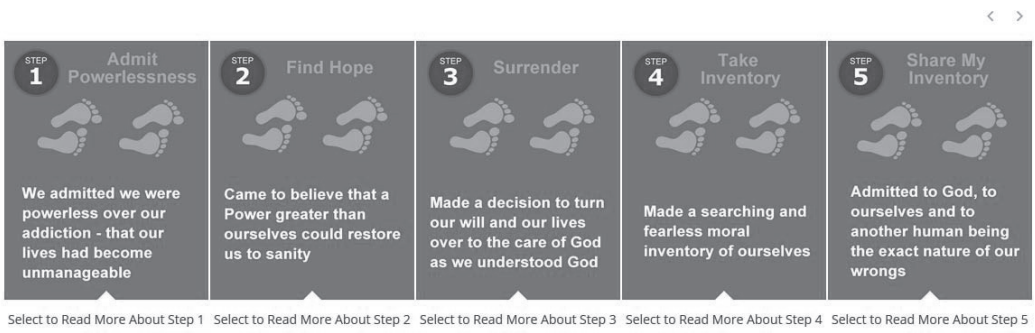

Figure 1: twelve steps, 12 STEP, http://www.12step.org

A few of the twelve steps are as follows [16]:

„Admit Powerlessness": The criminals have better finding, better researching and better resourcing ability than the country's citizens or the government's public servants. Cyber-criminals are hackers by profession so they have better equipment than the others employed. It is a weakness in the system, but may not be in despair.

„Find Hope": The citizens should not forget the hope of cyber-recovery. The citizens must to call for the person responsible for security in their organization who averts the incident and needs to restore the problem and the sanity of the users and reduce the feeling of powerlessness.

„Surrender": In fact the cyber assemblers help and actually do something to change which approaches are really destructive rather than constructive.

„Take Inventory": It has got to make a data backup if not at all time but at least regularly.

„Create the ISMS": In the high priority organizations or the governments' organizations it is obliged or recommended to create the Information Security Management System to effectively run the Information System. The ISMS rules give the instructions for the required level of information protection in the organization. The instructions for the work of citizens are included in the information system and for the internal audit of system. The ISMS doesn't work without the rules and the internal and external audit. There is a never ending stream of known-knowns that need to be continually addressed and promptly addressed.

„Meditate": This is the term in the information technology landscape which is the reflection time vital to improve, to understand and to know the risk landscape.

„Help Others": It has got to share the research results, the tutorials, the user's manuals with the partners, the vendors, the family members and the friends or the wider social circle, so that it can improve the interconnectivity of all collective devices.

3.2 Online helpdesk with cyber-devices

Today various forms of identification are widely found in test systems using different methods. System information tools have been researched whether they are able to discover a detailed network topology, hardware and software inventory. So it could provide us extremely detailed information not only about network, but hardware and installed software as well.

In the last few years Information Research were helped and improved materially by the color and a great many independent technical assessments of system (System Testing) and software development projects. Yearly there is a big number of utilities which are endorsing to explore the increasing scrutiny of IT Tools, the more comprehensive Network, Hardware and Software details.

The full Network Inventory making and monitoring IT Device Manager and Administrator System and Application shall endeavor to get close to Operating Systems Kernel, to collect a multitude of physical and logical Information, to analyze with different parameters, and to make feedback for the users, the system administrators or the hardware items factories. They do all this without any physical breakdown into pieces.

In this chapter the solutions are discussed that can help to collect most of the information related to the particular infrastructure including network topology, hardware and software elements as well. This information set is one of the main sources if we would like to estimate the security or the vulnerability risk of the infrastructure. The main advantage of our approach is that it focuses on IT security and the main purpose of information gathering is to improve the security level and decrease the risk related to it.

One of the most important areas of IT systems is the computer network, so a security analysis of network security is very important. By the network security investigation what should be considered is not only the endpoints but also the network security-relevant network devices, also known as security gateways, as well as the designed topology. Most of these are available in some form for companies. In addition, the test criteria were the type of network topologies – that are physical or logical –, the number and type of security gateways (LAN or WAN).

The network security testing has been influenced by the network services and network topology not only, but by all the endpoints features too. If a network endpoint can't be vulnerable by network services, it doesn't mean that the application of the endpoint can't access through the network services. Such application has security breaches. It is necessary to the network and applications System Information Tool to scan the more information about the endpoint. [17]

Security Vulnerabilities may be in plugin that is innocent-looking utilities. The user can give out the data by e-mail, on phone (GSM, 3/4G) or Internet/WiFi or Internal Network communications or other input data too. The Software Vulnerabilities are called the Vulnerable Operating Systems and Databases, Security updates or Faulty Application. The IT Prevention and Protection Method can reduce bad encryption, weak protection (viruses and spyware), the incorrect cleaning or weak passwords.

The result's system inventory is a report that includes the different network and hardware parameters and software environment parameters, which can help to find the network and system vulnerability. The more network and hardware detection applications usually are (more exactly system inventory) suitable for there, therefore the set of test described in this manuscript focus

exclusively the popular system inventory and their capable comparison, so the more distributions are found for the project.

Hardware and software inventory detailed by AIDA64 Network Audit from Windows platforms client connected to the corporate network is shown in Figure 1. This application is supported by command-line switches, creating inventories automated, which can make reports of the collected parameters from all the Network's devices, the PCs on the Network, shown in Figure 2. This AIDA64 Network Audit is compatible with all 32-bit and 64-bit Windows editions, including Windows 8.1 and Windows Server 2012 R2 too.

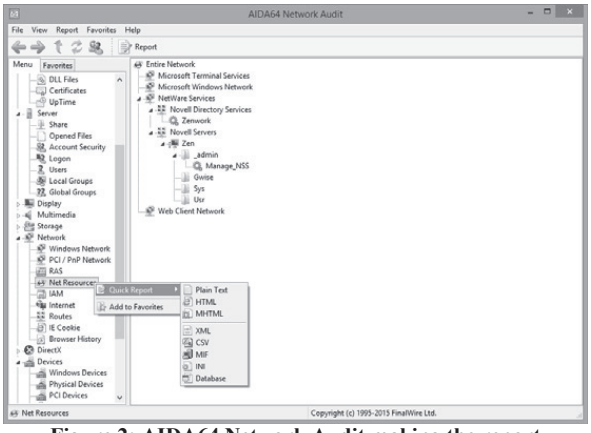

Figure 2: AIDA64 Network Audit making the report

Malware can be filtered with applications monitoring the system; their run can be spotted more easily. Naturally the appropriate and necessary utility can help the protection. Known as NOD32 ESET Endpoint Antivirus controls antivirus, antispyware and it securely supervises the operating system. This application has to keep the continuous control under the system and it has to run the virus definitely database daily so that the system can be safe. So this type of system controlling can slow down the full system and use better the resources, most of the time when it is most needed (for example data request). Of course the behavior of the system components and the monitoring can be optimized, so the most infection on the PC can be avoided. Without the systematic full system monitoring the system and their applications running slow down.

On behalf ESET spol. s r.o. the NRC marketing research and advisor Ltd. carried out the marketing research which was investigated behavior of the Hungarian Internet users with online survey, multilevel stratified and random sampling. The sample is a representative data of the people age between 18 and 69, who is at least a weekly on the Internet according to gender, age group, educational attainment and residence type. More than one million Hungarian visits knowingly the infected Web pages who gets to clear alert from the virus support before. One in ten adults, the 15 percent of the men or the 6 percent of the women switch off the security software on PC to want to access a file that is blocked by the anti-virus. Young people are particularly at risk (Figure 3). The 17 percent of the 18-29 years old usually switch off the security software on PC to want to open an infected file and the 12 percent of the 18-29 years old usually switch off the security software on PC to want to visit an infected WEB site.[18]

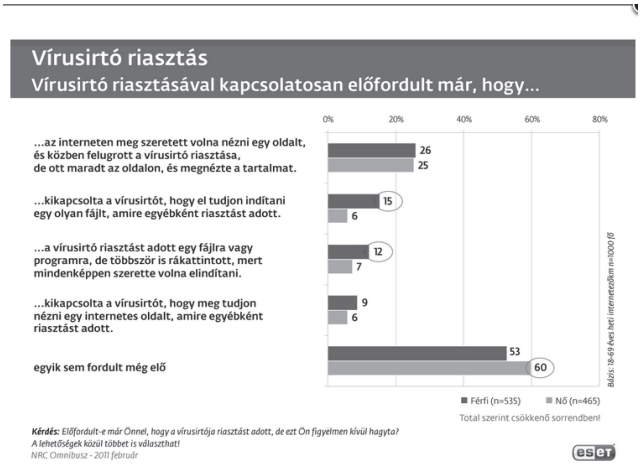

Figure 3: ESET, Hungarian Internet marketing research

There is another trap: the monitoring system made with good publicity but with the incorrect quality and the operating system used it. The Malware could be given access, it takes advantage of the system's weakness, it gets the data of the system and the user, phishing takes place.

The different types of system data can be collected in order to make complex statistics and the benchmarking system and the security risk testing system. The gained data can be compared with the data of the other operating system. Assessing the queered data the vulnerabilities of the system can be determined, the sensibility of the given data and the possibility of the good or bad using. The applications with the wrong-way used data can lead to Malware that can make use of the vulnerability of the system. The operating system has given out the most valuable information that runs on the PC or on the Mobile device (AIDA64) too.

The type and content of the data tracking can be difficult. The security risk and the number of the vulnerability can be lowered with the security rules and the security cases can be prevented. The very important security keys are Confidentiality, Integrity, Availability and their rules. [18]

4. Public servant awareness of their own vulnerability to cyber-threats

This chapter presents the result of test which was made by citizens' Public Service at an e-learning university system between October and November 2016. The test was written in December 2016. The constructive of strict information security rules help the citizens to understand the relevance of the rules. They are not aware of the need of information security. The other practical guide is the awareness of social engineering attention the ways that the organization don't be the victims of a possible social engineering attack.

On the Hungarian National University of Public Service the adult's information security teaching is followed by the year 2013 L. Hungarian Law [15]. One of the methods is the learning or orientation of the country's citizens or government's public servants where the citizens can get the information from the IT vulnerability or potential attack, the information security risk, the business continuous planning on the information security landscape or the information security rules by the teaching. On such as teaching the students wrote a test about their information security knowledge.

In the research the number of participants' is 42—there are IT security directors (18%), IT security managers (35%), persons responsible for data protection and jurists (2%), IT security experts (10%), IT engineers (5%) they are called IT experts.

The participants of the were IT experts age between 30 and 58, 66 percent age between 40 and 58 and 33 percent age under 40. 90 percent are male and 10 percent are female. 70 percent live in Budapest or Pest country and the rest live in the province. They are graduates.

The aim of the survey is to make statistics of the information security awareness, the information security practice, the knowledge of the Hungarian rules and the knowledge of the organizations structure and rules in the Hungarian Public Service. The survey of theme is the knowledge of the Hungarian Information Security Law in Public Service (IBTV) [3], obligation of the organization and rule with the IBTV, information security questions, IT risk analysis plan and functions. The IT experts corrected the test in the University where very interesting summary documents were made.

15 percent of the participants were excellent (90-100%), 70 percent good (75-90%) and 15 percent implemented the task at a medium level. The result were not influenced by the participants' age, gender or habitation, rather it was influenced by the work experience, the graduate and on the workplace loaded position.

The directors, the managers or jurists could give excellent answers to the question about the knowledge of the Hungarian rules and the knowledge of the organizations structure and rules in the Hungarian Public Service, and they could give weak answers to the question about IT themes. Even so they could implement the job very well. The IT engineer usually has not sufficient competence of organizational structure or rules. The engineers had excellent IT security practice, so they could answer the IT security exercise or questions very well.

The overall conclusion of the following discussion with the participants was that the IT security awareness should further develop in the Hungarian society. In the organization where the management is not engaged with the IT security, the IT rules of organization or Information Security Management System is only red tape documentation. Most of the IT experts consulted, according to the Hungarian IT control internationally advanced standards, believe much farther forward than the development of the use of the IT infrastructure.

On the other hand, from the test result it can be diagnosed that the interface is weak between IT regulation and IT practice. Both do not completely understand each other's language.

5. Conclusion

This paper outlines cyber-security which is a really broad area of information technology. It deals with average or medium vulnerability in an organization, citizens' identification, cyber-device and the information rules. The identification of the weakest links is indispensable in this context. The citizens who live in the country or work in the government's public service, their health, ill or behavior, their position in an organization, their professional experience are influential factors in the information security research. The citizens' health, ill or behavior causes real attention, because it influences the other component as well. The really important thing is the users' control without control which can occur from vulnerability to treatment, from attack trial to incident. It is an opportunity for cyber-crime and hackers wait for a chance.

Even the most advanced information technology and IT security system, the best IT professional, the most effective management in an organization, the best regulatory systems are useless if the citizen is the weakest link in the system who is keeping his/her own best interests in his/her mind, eliminates the Defence points and knowingly makes the system vulnerable. In the existing IT system the damage can be measured. In most cases it can cause completely irreparable damage. There is always an additional loss.

Citizens should be made aware on a regular basis of IT opportunities with the eventuating dangers and the caused damage too. The keyword is the systematic training and awareness. A single instruction is not enough, but information safety awareness for both a country's citizens and a government's public servants should be continuously improved.

6. References

[1] KOLKMAN, M.J. et al: Mental model mapping as a new tool to analyse the use of information in decision-making in integrated water management, Physics and Chemistry of the Earth, 30(4-5), 2005, pp. 317-332.

[2] HÖPPNER, C., Buchecker, M., and Bründl, M.: Risk communication and natural hazards. CapHaz project. Birmensdorf, Switzerland, 2010.

[3] GRANGER, S.: Social engineering fundamentals, part I: hacker tactics. Security Focus, December, 18, 2001.

[4] KROMBHOLZ, K., HOBEL, H., HUBER, M. and WEIPPL, E.: Advanced social engineering attacks. Journal of Information Security and applications, 22, 2015, p. 113-122.

[5] ORGILL, G. L., Romney, G. W., Bailey, M. G., & Orgill, P. M.: The urgency for effective user privacy-education to counter social engineering attacks on secure computer systems. In Proceedings of the 5th conference on Information technology education, 2004, October, pp. 177-181.

[6] PhishMe 2016 Enterprise Phishing Susceptibility and Resiliency Report (2016). PhishMe. available at: https://phishme.com/project/2016-phishing-susceptibility-report/

[7] SCHULLER: Az emberi tényező vizsgálata az információbiztonság, a személy- és vagyonvédelem, valamint az épületkiürítés területein, Nemzetközi Közszolgálati Egyetem, 2015.

[8] 1035/2012. (II. 21.) kormány határozat, Magyarország Nemzeti Biztonsági Stratégiájáról, 2012.

[9] 2013. évi L. törvény, az állami és önkormányzati szervek elektronikus információbiztonságáról, 2013.

[10] THE FINANCIALS TIMES, USA, New York.

[11] TÖRLEY, Közigazgatás - szervező hallgatók információbiztonság – tudatossága, Nemzetközi Közszolgálati Egyetem, 2016.

[12] ESET Magyarország: A kíváncsiságunk fertőz, 2011, http://www.eset.hu/hirek/kivanc sisagunk _fertoz?back=/hirarchivu m%3Fpage%3D9 – State: 1. December, 2016.

[13] SANS INSTITUTE, CIS Critical Security Controls, https://www.sans.org, – State: 20 December, 2016.

[14] THE CENTER FOR INTERNET SECURITY, SECURITY CONTROLS, https://www.cise curity.org, – State: 20 December 2016.

[15] https://www.owasp.org/index.php/Top_10_2013-A6-Sensitive_Data_Exposure, – State: 20 December 2016.

[16] 12 STEP, http://www.12step.org, – State: 20 December 2016.

[17] LEITOLD, F., et. al.: Testing endpoint protections against malicious URLs on social media sites, v 1.0, September 4, 2013, Veszprog Ltd, CheckVir.

[18] LEITOLD, F., et. al.: Combining commercial consensus and community crowd-sourced categorization of web sites for integrity against phishing and other web fraud,- 2014, Veszprog Ltd, CheckVir.

[19] ILLÉSSY, M., NEMESLAKI, A. and SOM, Z.: Elektronikus információbiztonság-tudatosság a magyar közigazgatásban, 2014.

eGovernment II

HOW TO SUCCEED WITH DIGITAL TRANSFORMATION PROJECTS IN PUBLIC SECTOR WITH FOCUS ON MUNICIPALITIES (RESEARCH IN PROGRESS)

Odd Ruud[1]

Abstract
Public sector must undergo radical changes in the years ahead to cope with demographic and financial challenges. The use of technology, building innovation capabilities and digitalization through digital transformation projects are key factors to succeed with change in order to realize expected benefits. Public sector has deep cultural and legacy roots where culture is the hardest part to change, which makes it complex to succeed with digital transformation projects. There are only a few references of relevant frameworks for digital transformation projects in the literature that can be applied directly to public sector. In this paper three hypothesizes for future research are identified.

1. Introduction

A more efficient public sector is required to meet demographic and financial challenges in the years to come. The impact of demographic ageing in Europe will be of major significance in the next decades and will mark a transition towards a much older population structure where the age dependency ratio increases [15]. Public sector need constantly to look for opportunities in order to improve productivity, increase collaboration, improve process efficiency and focus on innovation [13]. To become more efficient the public sector must change where digitalization and the application of new technology are key drivers for change. Advances in and development of new technology can drive significant economic growth [48]. Digitalization requires change in the way public sector organize, produce and deliver services. Change management, change initiatives and transformation projects are important activities to succeed with digital transformation [48]. Leadership competencies in these areas are important for successful digital transformation projects. Public sector need to transform to a future digitized state and the goal of the digitalization is to deliver better outcomes getting more from less and making resources more productive.

Traditional private sector methodologies related to change management cannot be used directly without adaption to public sector needs. Private sector organizations are measured on generating revenue and profit while public sector organizations (in this research: municipalities) are given their tasks primarily by expectations and demands from the citizenry, by law or from the politicians. Public sector is funded by taxes, fees and through financial transfers from other parts of public sector like the government as an example. Service deliveries from the public sector are measured on the agreed quality based on expectations and demands from citizens and how cost-efficient they are delivered. The province of Ontario in Canada has described the goals for its 444 municipalities as: "the goals, on behalf of taxpayers, should always be to provide the best and safest services at the most efficient cost" [36]. To realize benefits municipalities must change through a combination of

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continuous improvement activities and radical change programs. The task of improving quality and efficiency in the delivery of services in the municipalities is a highly variable and complex process with several stakeholder groups where each group have different expectations. The complexity and scope of services delivered by municipalities increases the challenge of change. Efforts to improve and change will be impacted by citizens, divergent political considerations and various agendas of politicians and political parties. Combined, this might result in decisions with good intentions and actions that produce little actual improvement.

Technology has over the last years become more advanced and more affordable. The pace of useful innovations and inventions in various fields (scientific, cultural, social, industrial, and technological) are more rapid than at any time in human history and the current information age can also be called the knowledge and ability era [51]. As Schwab[2] describes it: "the ability of government systems and public authorities to adapt will determine their survival" [42]. There is currently not a model specifically for the public sector related to organisational change, and there is a need for a generic public sector change model [26]. In addition, there is also a lack of systematic literature review on costs, opportunities and benefits using technology in the public sector, and a lack of empirical studies evaluating the performance using technology [49].

The benefits of using technology to digitize municipalities can be huge. However, if municipalities are not able to radically change through successful transformation projects, they will not be able to handle challenges in the years to come and at the same time, keep the level of welfare on the same level or higher in the future. A survey amongst Norwegian public sector organizations in 2014 showed that the maturity level of change management competence, portfolio management, innovation governance and benefit realization were one (1) on a scale from one to five (where *one=ad-hoc* and *five =optimized*) [37]. In a survey from 2015 two out of three top managers in public sector stated that lack of digital competence is a barrier to succeed with digitalization [38]. In a 2016 survey 82% of the respondents agreed that there is a lack of culture and processes to realize benefits of investment and change activities [39]. The assumption is that findings from the three surveys could be valid for the public sector in other European countries since the demographic and financial challenges are similar. Consequently, public sector must become more professional and there is a need to establish a framework for digital transformation. Digital transformation projects are closely related to innovation. Little effort however has been done to analyze and evaluate the impact of innovation in public sector [19].

2. The aim of the research

This research (in progress) will examine how digitalization will affect the way public sector (with focus on municipalities) organize, produce and deliver its services, identify key success factors related to digital transformation projects and establish a proposed framework for digital transformation projects in municipalities to realize benefits. Public sector organizations exist on three levels: national, regional (state) or local (municipal). The unit of analysis in this research is municipalities in Norway. Norway is a part of the Nordic region (Norway, Sweden, Finland, Iceland and Denmark). The Nordic region has several similarities, and results from this research should therefore be applicable to the other countries and municipalities in the region. Since the demographic and financial challenges are similar in Europe the assumption is that the findings could be applied to other countries with some modifications in each country.

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The research question for this review:

What are the key success factors for digital transformation projects in municipalities?
with the following sub-questions:

a) what are the key factors that prevent municipalities to succeed in digital transformation projects and not realizing associated benefits?

b) what are the perspectives on digitalization, change and transformation from the top managers in municipalities?

c) what are the key factors to succeed with digital transformation projects in municipalities?

In next phase of the research a proposed framework will be developed for digital transformation projects in municipalities based on the literature review.

3. The literature review

3.1 Digital transformation

The term digital can be seen as the emerging trend of digitalization where technology is integrated in all aspects of daily life. This also affect how citizens want to interact with the public sector through digital channels accessible 24/7. Digitalization is the use of digital technologies to change a business model, provide new revenue and value-producing opportunities; it is the process of moving to a digital business [18]. When processes are digitized, models to describe procedural knowledge are needed and such models consist of algorithms, work processes and capacities [21]. Over the past two decades' organizations have been through digital maturation, where processes and functions have been digitized in the transition from analog to digital followed by integrating digitalization across functions with a user-centric view [8]. Municipalities are organized vertically in silos and the challenge is to integrate user-centric services across the silos. The next steps in digitalization is digital reinvention involving the rethinking of customer and partner relationships from a perspective of fundamental customer need combined with multiple technologies including cloud, internet of things, cognitive and mobile [8]. For traditional public sector organizations like municipalities, digital reinvention involves a fundamental, ground-up reconception of strategy, operations and technology and to succeed organizations should [8]:

- pursue a new strategic focus
- build digital competence with a holistic view of products, services, processes
- redefine customer/user experience
- establish new ways of working (identify, retain, and build the right talent to create and sustain a digital organization).

In public sector organizations, the challenge is to move from relatively small changes to start making the big changes (a transformation) supported by ICT and digitized processes with a holistic view of a citizen from birth to death resulting in improved services and cost savings and digital transformation requires change in [5]:

- services (from paper to online)
- processes (change the way public sector operate and manage services internally)
- working practices (with agile project management and governance)
- technology (updating old technology)
- organizational (introducing new and cross boundaries operating models)

Digital transformation of key processes affects products, services, processes, organizational structures and management concepts [30]. This means that digital transformation requires an integrated approach to technology, process and people in order to manage the availability and sustainability of processes [3]. In organizational structure and culture all elements are interdependent (change in one element cause changes in the other element) both within and between organizational levels [33].

The process of digitalizing public sector is complex due to contradictory incentives, vertical structures, employee job security rules and citizen-centric services where no easy solutions exist [16]. Complexity occurs when several interrelated aspects must be considered and it is not possible to view all of them [25]. Characteristics of digital transformation projects are often unforeseen new structures, with unexpected new properties and radical innovation. Such problems/issues are called wicked [7]. The social complexity of wicked is more difficult to manage than their technical difficulties. Handling wicked problems require new leadership skills and competencies to cope with the need for quality, flexibility, adaptability, speed and experimentation. Each activity and effort in implementing digital transformation projects in public sector is unique, have often not been done before and are entwined with other problems like the not invented here syndrome [6].

A digital public sector use internet and the World Wide Web to deliver public sector information and services to citizens [46], "the use of information and communications technologies to improve the functioning of government" [23] and to improve the activities of public sector organizations [32]. In Europe, there has been high expectations of significant cost savings when implementing a digitized public sector [31]. The purpose is to improve performance and provide benefits citizens [50]. A digitized public sector is a collaborative community of public authorities, businesses, citizens and civil society contributing to further development of public sector services [12]. ICT itself does not transform public sector, but ICT can be used in redesigning the ways public sector exchange information internally and externally through collaboration [34]. To ensure success in digitizing public sector a strong central leadership complemented with proactive local and regional initiatives driven forward by local champions are required [31].

Performance indicators are used to measure effects of transformation projects. Performance can measure the impact of working practice and the impact on cost/efficiency [10]. There is a weak correlation between performance indicators and performance itself. The relationship between actual and reported performance often declines and is a phenomenon explained as the performance paradox [45]. To plan and follow up digital initiatives business cases should be used. A business case documents the justification for undertaking a project taking into consideration the total business change. The use of business cases might reduce the risk of unintended performance paradox occurring. If initiatives are not formalized through business cases there are a risk of developing technology-enabled services that do not correspond to the needs of employees, citizens

and businesses [27]. On the other hand, there has been few attempts to undertake a systematic review on the costs, opportunities, benefits and risks that influence the implementation of e-government, and there is a lack of empirical studies that can evaluate the performance [49]. In order to understand the technological change in public sector, how new radical technological solutions can be introduced and at the same time keep providing services required by laws and regulations, the concept of technological capacity as a performance index can be used [28].

Several public sector digital initiatives focus on improving front-end services. In Norway, the government has introduced the concept of digital agenda. The goal of digital agenda is to improve the interaction between citizens/businesses and public sector organizations. However, there is a need to shift from the predominant front-office evaluation of digital public sector to back-office evaluation [33]. Focusing on back-office will bring better insights into the impacts of e-government concerning business process reengineering (BPR), reduction of costs and the effectiveness of public sector organizations. The use of technology also redefines the way public sector should be organized and how the services are delivered. People involved in the provision of public governance should consider, on a regular basis, whether things can be done better and smarter and how creative solutions can outperform old and trusted ones [44]. Despite all possibilities using technology, public sector innovation has tended to be small-scale and gradual due to budget scarcity, group conflict, cultural norms and prevailing patterns of social and political behavior [50].

Digitalization changes the power in relationships between public and private sector, and between public sector and citizens. New forms of governance emerge with consequences for how we understand and exercise citizenship with new technology-mediated processes supporting change processes [31].

3.2 Digital governance and innovation

In public sector, digital governance can be compared with innovation since attributes can be mapped into characteristic features of innovation in services, processes and organizational structures [35]. Innovation is a concept which includes the following features: novelty (a change from the current situation), adoption (a change that is embraced by users) and outcome (value) [40]. Digital government evolution consists of four stages: digitization, transformation, engagement and contextualization [24] [9]. Digital transformation projects must cover all aspects mentioned above to be successful. An organizations technological competence (the ability to understand, use and exploit relevant state-of-the art technology internally) combined with network competence have a significant impact on innovation success [41]. In public sector innovation can be defined as executing new ideas to create value and innovation should be managed as a process to secure that innovation is executed [43]. Intangible outputs of an innovation process can be new upgraded services and processes [6]. To succeed with digital transformation projects digital competence and innovation competence are therefore needed amongst [44]:

- politicians (with a need to demonstrate political leadership by advancing new ideas)
- public managers and employees (well-educated, competent and driven by norms to improve services)
- citizens playing an active role in encouraging public innovation.

Innovation in public sector can be further enhanced through collaboration by creating spaces outside the organization (but still close to the service production) where employees, users, managers and policy experts with different professional backgrounds can collaborate with each other [44]. Innovation processes can be incremental (small and continuous improvements to existing practices using technology) or radical innovation (major breakthroughs in technology that changes completely the way things are done, tends to result from research and are more unpredictable) [48]. Public sector is bureaucratic by design and thus incremental in its approach to change [9]. Continuous improvement is unlikely to succeed if there is a lack of senior management support [3].

3.3 Digital transformation projects

Digital public sector projects are embedded in combinations of political reforms and organizational changes designed to enact, support and drive transformation in the organization of the public sector [11]. Several digital projects in public sector fails and expectations are not achieved due to the inability to deal with complexity and uncertainty. There is no uniform, standard way dealing with high complexity and uncertainty in situations with many stakeholders and with a standard that works in all situations [25].

The traditional approach of governing IT projects in public sector has been the waterfall approach were requirements were locked down, timetable and progress were set in a linear fashion from design to implementation [5]. Experience shows that large ICT projects in the public sector governed by the waterfall approach in many cases result in excessive cost and time overruns. There is a need for an alternative approach to handle uncertainty, where the upfront design is minimized, with frequent iterations of emerging services interacting with users, and where multidisciplinary teams are given autonomy to manage the uncertainty and adapt as the project progress [5]. Agile projects can be an alternative and are driven by user research, iteration and flexibility thereby reducing the risk that is taken in each part of the project. Agile methodology can reduce the risk of cost and time overruns. In agile projects, core project and programme management disciplines like managing risks, engaging stakeholders and monitoring dependencies are still needed and it is still necessary to work towards a completion date. Changes in the environment, expectations from stakeholders and technological development during the project period require organizations to adapt fast to changing conditions [25].

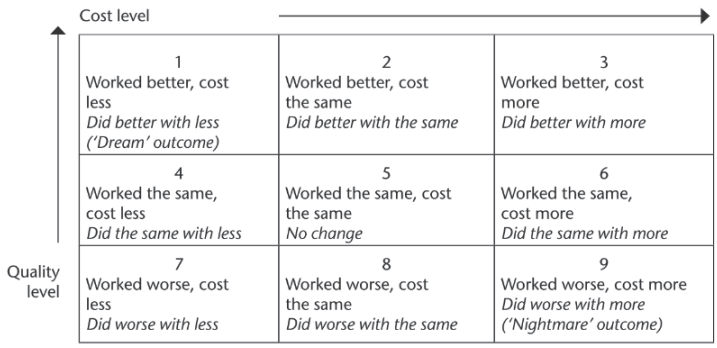
Drivers for change projects in public sector are the need to save money, improve services and mitigate the risk of failure related to implementing new ICT solutions [5]. Using technology in public sector requires organizational change, and to realize productivity gains a fundamental take-up of opportunities through a transition towards fully digital operations is needed [14]. Dynamic capability, in addition to transformational leadership, interpersonal skills, entrepreneurship and network governance skills, are essential characteristics in leadership competence to succeed with transformation projects [29]. To succeed with digital transformation, organizations need to establish governance processes on management level [30]. A successful transformation towards a digital public sector need to look at the *digital public sector-as-a-whole* concept (connected public sector) which focuses on provision of services at the front-end supported by integration, consolidation and innovation in back-end processes and systems to achieve maximum cost savings and improved service delivery where technology is a strategic tool and enabler for innovation [47].

The concept of stakeholders is defined as any group or individual who can affect or is affected by the achievement of an organizations purpose [17]. Stakeholders are described as those who can make demands on an organization, those who can affect the organization and those who are affected

by the organization [1]. Risk can be reduced by transparent communication and by streamlining stakeholder interaction through mapping stakeholders [2]. In public sector stakeholder engagement benefits include: increased efficiency in and effectiveness of services, improved risk management practices (allows risk to be identified earlier and by that educing future costs, ensuring services are delivered in collaboration with stakeholders and enhanced capacity to innovate [20]. Examples of interest groups in public sector can be municipal executive board, municipal council, political parties, governmental agencies, users of the service delivered, ICT department, chief municipal executive, managers, employees, unions, lobbyist, media and suppliers. Various interests and power from diverse stakeholder categories can be a success or failure for e-government and stakeholders interest should therefore be related to achieving the goals of a digital public sector [2]. Technology can change or strengthen the power structure [4]. Based on the new power structure implementing technology can create conflicts and the implementation will of that reason be a result of negotiations between involved interest groups in the new power structure.

3.4 Potential outcomes

There can be nine potential outcomes of how government works and what it costs [22]:



The dream outcome (cell number 1) might be a result of smarter management, better technology and the promotion of a more favorable image of the government. The goal of digital transformation projects should move public sector organizations like municipalities upwards and to the left in the diagram.

4. Conclusions

Public sector must become more efficient to meet future demographic and financial challenges. To become more efficient, change is required, where change is driven by digitalization and implementing new technology. Public sector must transform to a future digitized state where people, processes and organizational structures must change. To realize benefits a framework for digital transformation is needed. The goal of digital transformation is to deliver better outcomes using less resources by reinventing the way services are produced and delivered. Digital transformation projects are 20% about technology and 80% about people, processes and organizational structure. Building digital leadership competence is crucial to succeed with digital transformation projects. Digitalization mean that technology is integrated in all aspects of life across organizational boundaries. Digital transformation requires a fundamental, ground-up reconception of strategy, operations and use of technology. Based on the literature review a proposed framework

for digital transformation projects is developed. The following proposals and hypothesises have been developed:

P1:
Municipalities are not able to meet future demands and expectations without digital transformation. Top managers in the municipalities do not have the capabilities or skills needed to implement digital transformation projects.

H1:
There is a positive relationship in municipalities where the municipal chief administrative officer has digital competence/skills and number of digitized services implemented.

P2:
Municipal chief administrative officers must have skills in project and change management to succeed with digital transformation projects

H2:
There is a positive relationship in municipalities where the municipal chief administrative officers have leadership skills in project and change management, and the number of successful digital transformation projects implemented.

P3:
The culture in municipalities with their conservative thinking, change resistance on all levels and leaders who are risk averse is an obstacle to succeed with digital transformation projects.

H3:
There is a significant relationship in municipalities where the municipal chief administrative officers have a risk-averse culture and lack of plans for benefit realization
The next phase of the research is to verify the hypothesizes with a quantitative analysis. A questionnaire will be developed and sent to all the chief municipal executives in all municipalities in Norway. Based on the findings a proposed framework for digital transformation projects in municipalities will be developed.

5. References

[1] ACKERMANN, F. and EDEN, C.: Strategic Management of Stakeholders: Theory and Practice, *Long Range Planning*. Elsevier Ltd, 44(3), 2011, pp. 179–196. doi: 10.1016/j.lrp.2010.08.001.

[2] AL-BALUSHI, F. M., BAHARI, M., RAHMAN, A. A. and HASHIM, H.: Conceptualization of E-government Integration Studies, *Journal of Theoretical and Applied Information Technology*, 89(2), 2016, pp. 439–449.

[3] ALHAQBANI, A., REED, D. M., SAVAGE, B. M. and RIES, J.: The impact of middle management commitment on improvement initiatives in public organisations, *Business Process Management Journal*, 22(5), 2016, pp. 924–938. doi: 10.1108/BPMJ-01-2016-0018.

[4] ANDRÉASSON, E.: Digitalisering i den offentliga förvaltningen - IT, värden och legitimitet', *Linköping Studies in Arts and Science*, 8(659), 2015.

[5] ANDREWS, E., THORNTON, D., OWEN, J., BLEASDALE, A., FREEGUARD, G. and STELK, I.: *Making a success of digital government*. London, UK, 2016.

[6] ARIAS-PÉREZ, J., PERDOMO-CHARRY, G. and RÁOS, C. C.: Not-Invented-Here Syndrome and Innovation Performance: the Confounding Effect of Innovation Capabilities As Organisational Routines in Service Firms, *International Journal of Innovation Management*, (December), 2016, p. 1750036. doi: 10.1142/S1363919617500360.

[7] BEINECKE, R. H.: Leadership for Wicked Problems, *The Innovation Journal*, 14(1), 2009, pp.1–17. doi: Article.

[8] BERMAN, S. J., KORSTEN, P. J. and MARSHALL, A.: A four-step blueprint for digital reinvention, *Strategy & Leadership*, 44(4), 2016, pp.18–25. doi: 10.1108/SL-06-2016-0042.

[9] BERTOT, J. C., ESTEVEZ, E. and JANOWSKI, T.: Digital Public Service Innovation: Framework Proposal, in *ICEGOV2016*. Montevideo, Uruguay., 2016, p.10. doi: 10.1145/12345.67890.

[10] Booze Allen Hamilton: The Worlds most Effective Policies for the E-economy, Booz Allen Hamilton, London, 2002. Available at: http://scholar.google.com/scholar?hl=en&btnG =Search &q=intitle:The+World's+Most+Effective+Policies+For+The+e-Economy#3.

[11] CORDELLA, A. and IANNACCI, F.: Information systems in the public sector: The e-Government enactment framework, *Journal of Strategic Information Systems*. Elsevier B.V., 19(1),2010, pp.52–66. doi: 10.1016/j.jsis.2010.01.001.

[12] DAVIES, R.: *eGovernment using technology to improve public services and democratic participation*, *EUresearch service*. doi: 10.2861/150280, 2015.

[13] DILMEGANI, C., KORKMAZ, B. and LUNDQVIST, M.: *Public-sector digitization: The trillion-dollar challenge*, M*cKinsey&Company*. Available at: http://www.mckinsey. com/business-functions/business-technology/ourinsights/public-sector-digitization-the-trillion-dollar-challenge, 2014.

[14] DUNLEAVY, P., MARGETTS, H., BASTOW, S. and TINKLER, J.: New public management is dead - Long live digital era governance, *Journal of Public Administration Research and Theory*, 16(3), 2006, pp.467–494. doi:10.1093/jopart/mui057.

[15] EU Eurostat (2016) *Eurostat*, *Population Structure and Ageing*. Available at: http://ec.europa. eu/eurostat/statistics explained/index.php/Population_structure_and_ageing (Accessed: 20 June 2006).

[16] FOUNTAIN, J. E.: Prospects for the Virtual State, 2004. Available at: http://www.j.utokyo.ac .jp/coeps/pdf/040710.pdf.

[17] FREEMAN, R. E.: *Strategic Management: a Stakeholder Approach*. Marshfield, Massachusetts: Pitman Publishing, 1984.

[18] Gartner Group, *Digitalization - Gartner IT Glossary*, *Gartner Glossary*. Available at: http://www.gartner.com/it-glossary/digitalization/, 2016.

[19] GLOR, E. D. and EWART, G. A.: What Happens to Innovations and Their Organizations ? Piloting an Approach to Research, *The Innovation Journal: The Public Sector Innovation Journal,* 21(3), 2016, pp.1–25.

[20] Governance Institute of Australia, Good Governance Guide Stakeholder engagement (public sector).Governance Institute of Australia 2015. 2015, Available at: http://www.good governance.org.au/.

[21] GRAY, J. and RUMPE, B.: Models for digitalization, *Software & Systems Modeling*, 14(4), 2015, pp.1319–1320. doi: 10.1007/s10270-015-0494-9.

[22] HOOD, C. and DIXON, R.: *What We Have to Show for 30 Years of New Public Management: Higher Costs, More Complaints*, *Governance: An International Journal of Policy and Administration*. doi: 10.1111/gove.12150, 2015.

[23] JAIN, A.: Using the lens of Max Weber ' s Theory of Bureaucracy to examine E-Government Research, in *Proceedings of the 37th Hawaii International Conference on System Sciences (HICSS'04)*, 2004, pp. 1–10. doi:10.1109/HICSS.2004.1265321.

[24] JANOWSKI, T.: Digital Government Evolution: From Transformation to Contextualization, *Government Information Quarterly*, 32(3), 2015, pp.221–236. doi: 10.1016/j.giq.2015.07.001.

[25] JANSSEN, M. and VAN DER VOORT, H.: Adaptive governance: Towards a stable, accountable and responsive government, *Government Information Quarterly*, 33(1), 2016, pp. 1–5. doi: http://dx.doi.org/10.1016/j.giq.2016.02.003.

[26] JUNGE, K., KELLEHER, J. and HADJIVASSILIOU, K.: *What is the scope for organisational change in the public sector in Europe?*, *The Tavistock Institute*, 2006. Available at: http://www.ccegov.eu/ (Accessed: 27 August 2016).

[27] LAU, E.: E-Government and the Drive for Growth and Equity Organization for Economic Cooperation and Development, in Mayer-Schönbeger & Lazer (ed.) *From Electronic Government to Information Government*.Cambridge, Mass.: MIT Press, 2006, pp.39–58.

[28] LEMBER, V., KATTEL, R. and TONURIST, P.: *Public Administration, Technology and Administrative Capacity*. doi:10.13140/RG.2.2.25115.87845, 2016.

[29] LEWIS, J. M., RICARD, L. M., KLIJN, E.-H., GROTENBREG, S., YSA, T., ADRIÀ, A. and KINDER, T.: *Innovation environments and innovation capacity in the public sector*, 2015.

[30] MATT, C., HESS, T. and BENLIAN, A.: Digital Transformation Strategies, *Business and Information Systems Engineering*. Springer Fachmedien Wiesbaden, 57(5), 2015, pp. 339–343. doi: 10.1007/s12599-015-0401-5.

[31] MILLARD, J.: Reorganisation of Government Back-Offices for Better Electronic Public Services, in *Electronic Government: 3rd International Conference (EGOV 2004)*, 2004, pp. 363–370. doi: 10.1007/b99836.

[32] VAN DER MOLEN, P. and WUBBE, M.: E-Government and E-Land Administration - As an example: The Netherlands, in *Coastal Areas and Land Administration – Building the Capacity 6th FIG Regional Conference*, 2007, pp.1–13.

[33] NOGRAŠEK, J. and VINTAR, M.: Observing organisational transformation of the public sector in the e-government era, *Transforming Government: People, Process and Policy*, 9, 2015, pp. 52–84. doi: 10.1108/TG-04-2014-0014.

[34] POLLITT, C., THIEL, S. and VAN AND HOMBURG, V.: New Public Management in Europe, *Management*, (October), 2007, pp. 1–7. doi: 10.1057/9780230625365.

[35] POTNIS, D. D.: Measuring e-Governance as an innovation in the public sector, *Government Information Quarterly*, 27(1), 2010, pp. 41–48. doi: http://dx.doi.org/10.1016/j.giq.2009.08.002.

[36] Province of Ontario (2007) *Municipal Performance Measurement Program*, *Performance Measurement and Metrics*.doi: 10.1108/EUM0000000007224.

[37] Ramboll Management Consulting (2014) *IT I PRAKSIS 2014*.

[38] Ramboll Management Consulting (2015) *IT i Praksis 2015*.

[39] Ramboll Management Consulting (2016) *IT i Praksis 2016*.

[40] REILLON, V.: *Understanding Innovation*, 2016.

[41] RITTER, T. and GEMÜNDEN, H. G.: The impact of a company's business strategy on its technological competence, network competence and innovation success, *Journal of Business Research*, 57(5), 2004, pp.548–556. doi:10.1016/S0148-2963(02)00320-X.

[42] SCHWAB, K.: The Fourth Industrial Revolution: what it means and how to respond, *Foreign affairs*, December, 2016, pp.1–7. Available at: https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what it-means-and-how-to-respond/.

[43] STEWART-WEEKS, M. and KASTELLE, T.: Innovation in the Public Sector, *Australian Journal of Public Administration*, 74(1), 2015, pp. 63–72. doi: 10.1111/1467-8500.12129.

[44] SØRENSEN, E. and TORFING, J.: Collaborative Innovation in the Public Sector, *The Innovation Journal*, 17(1), 2012, pp. 1–14. Available at: https://vpn.utm.my/docview/1362242 870?accountid=41678.

[45] VAN THIEL, S., LEEUW, F. L.: The Performance Paradox in the Public Sector, *Public Performance &Management Review*, 25(3), 2002, pp. 267–281. doi: 10.2307/3381236.

[46] United Nations (2001) 'Benchmarking E-government : A Global Perspective'.

[47] United Nations (2008) *United Nations e-Government Survey 2008: From e-Government to Connected Governance*, *UN E-Government Survey 2008*. New York, USA. Available at: http://scholar.google.com/scholar?hl=en&btnG=Search&q=intitle:UN+E-Government+Survey+2008#0.

[48] WALPORT, M. and CRAIG, C.: (2014) *Innovation: Managing Risk, Not Avoiding It. Evidence and Case Studies*. Available at: https://www.gov.uk.

[49] WEERAKKODY, V., IRANI, Z., LEE, H., OSMAN, I. and HINDI, N.: E-government implementation: A bird's eye view of issues relating to costs, opportunities, benefits and risks, *Information Systems Frontiers*, 17(4), 2015, pp. 889-915. doi: 10.1007/s10796-013-9472-3.

[50] WEST, D. M.: *Improving technology utilization in electronic government around the world, 2008*, *Brookings Institution, Governance Studies.* Washington, 2008. Available at: http://www1.idc.ac.il:549/2004/90105.pdf.

[51] YASINI, P.: Specific characteristics of innovation', *International Journal of Organizational Leadership*, 5, 2016, pp.162–171.

E-COHESION: E-SOLUTIONS IN THE IMPLEMENTATION OF COMBINED FINANCIAL INSTRUMENTS

György Nyikos[1], Szilvia Hajdu and Tamás Laposa[2]

Abstract
Europe is facing an investment gap and the so-called financial instruments seem to be one of the solutions. They invest public sources on a repayable basis with a revolving character, which allows for a much greater efficiency in the allocation of public capital and the long-term sustainability of public investment. Policymakers see considerable value in supporting the further development of FIs and their use in both existing and new policy-related areas of activity[3]. The combined-credit is a unique financial development tool where credit and non-repayable assistance can be requested within a single financial product. [10,13]

The paper analyses the Hungarian practice using this special financial instrument with the application of information technology, both looking at the empirical evidences and seeking for an answer to the question, whether the combined utilization of financial instruments and grants is effective, useful or not, and how the different IT solutions could affect the efficiency of this financial product.

It is argued in this paper that the utilization of information technology can significantly improve the effectiveness of using financial instruments. This paper has three main aims: first, to review the legislation and the approach of Member States on the utilization of financial instruments; second, to analyse current and previous forms of IT support and their impact on the efficient utilization of the above instruments; third, to make proposals for further research on the e-government-based utilization of financial instruments.

Key words*: financial instrument, combined-credit.*

1. The relevance of financial instruments and the combination

Financial instruments[4] (FIs) [4] provide funding for investments which are expected to be financially viable and do not give rise to sufficient funding from market sources. FIs can take the

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[3] The recent EU Budget Review as well as the new Investment Plan for Europe noted that FIs could provide an important new financing mechanism for strategic investments by attracting co-investment from other public and private sector sources in order to achieve EU policy goals more efficiently.
[4] Regulation (EU, Euratom) No 966/2012 of the European Parliament and of the Council of 25 October 2012 on the financial rules applicable to the general budget of the Union and repealing Council Regulation (EC, Euratom) No 1605/2002; "financial instruments" means Union measures of financial support provided on a complementary basis from the budget in order to address one or more specific policy objectives of the Union. Such instruments may take the form of equity or quasi-equity investments, loans or guarantees, or other risk-sharing instruments, and may, where appropriate, be combined with grants".

form of loans, guarantees, equity capital or venture capital, using tailor-made instruments, off-the-shelf instruments or combined solutions and can be *implemented as* established at EU level[5] or at national level[6]. The *revolving nature* of FIs allows for much greater efficiency in the allocation of public capital and for the long-term sustainability of public investment. By unlocking other public sector funding and private sector resources through co-financing and co-investment, FIs aim to *increase the overall capital available*. In addition, the *private sector participation* enables policymakers to make use of private sector skills and expertise in areas such as identifying investments, decision-making, managing commercial operations and the ability to achieve returns.

One of the main advantages of using FIs is the added value that revolving instruments have over grants in terms of the efficient use of public resources. Repayable forms of support can also act as an incentive for better quality investments as the investments need to be economically viable so that the final recipient is able to repay the support provided. Through the Investment Plan for Europe the Commission strongly encourages the use of financial instruments that could replace traditional grants in ESIF[7] funding, in areas such as SME support, CO2 reduction, environmental and resource efficiency, ICT, sustainable transport and R&I. [24]

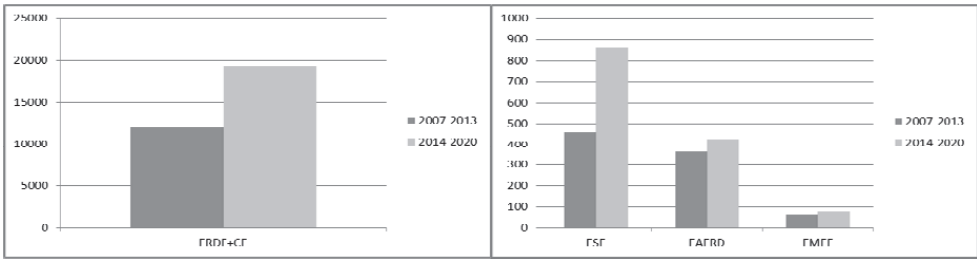


Figure 1: Amount of ESIF funding delivered through financial instruments in 2007-2013 and 2014-2020 (EUR million)

Source: Investing in jobs and growth - maximising the contribution of European Structural and Investment Funds, [12]

A new development in the 2007-2013 programming period was the combined use of financial instruments and grants, partly as an answer or reaction to the financial crisis[8]. However in the 2007-2013 programming period there were short and limited rules and later few guidance documents on Financial Engineering Instruments (FEIs) without any word about combination. It gave room for manoeuvre for the Member States but also caused legal uncertainty. The regulatory texts on FIs for the 2014-2020 period show that the legislators have attempted to address many of the challenges that have arisen in this programming period in the regulatory provisions and address issues raised

[5] managed directly or indirectly by the European Commission (EC)

[6] directly implemented by Managing Authorities (MAs) or via a Holding Fund where the holding fund manager may be the European Investment Bank (EIB), the European Investment Fund (EIF) or other financial institutions or agencies and with financial intermediaries or implemented via financial intermediaries without holding fund

[7] European Structural and Investment Funds

[8] As a consequence of the economic crisis in Hungary it became practically impossible for the SMEs to receive commercial bank loans even for the finance of their own (co-financing) part of the investment supported by grants. To tackle this problem, the objective was to develop the methods of micro-financing and to increase the amount of available resources.

by Managing Authorities (MAs) and the European Court of Auditors[9], and make possible *more types of FI combination* than earlier, which facilitates the transition from a financial support regime based on grants towards the use of revolving FIs. [24]

The Common Provisions Regulation (CPR)[10] makes it clear that *more types of combination may be possible[11]:* [5]

- combination of different programme contributions and different funds in one financial instrument; and

- combination of financial instruments and grants and other forms of assistance.

The advantage of using the combined solutions can be the achievement of critical mass and economies of scale as well as a wider spectrum of policy objectives. In the "Guidance for Member States and Programme Authorities on Combination of support from a financial instrument with other support" the Commission presented *two types of combination* of support: within a financial instrument operation (*a single operation*) and at the level of the final recipient (*combination of two separate operations*). According to the guidance, grants as technical support, interest rate subsidies and guarantee fee subsidies can be combined with the FI in a single operation if they are *directly related to the FI and target the same final recipients*. However, *separate records must be kept* for each form of support. Alternatively, final recipients supported by an ESI Fund FI may also receive assistance from another ESI Fund priority or programme or from another instrument supported by the EU budget. Yet again, separate records shall be maintained for each source of assistance. [24]

In case of launching combined products, it should be taken into account that *processes should not be much longer and complicated* than in case of regular, single-profiled products (direct grants and assistances with revolving nature).

In the interests of ensuring proportionate control arrangements and of safeguarding the added value of financial instruments, Member States should reduce the administrative burdens of final recipients. Pursuant to the provisions of the above regulation, Member States shall provide electronic government services and offer paperless fund management possibilities to beneficiaries to reduce their administrative burdens.

[9] For example, revised provisions relating to the ex-ante evaluations that must be undertaken before FIs are established in the OPs. It has been made clear that ex-ante evaluations will tie the findings related to market gaps more closely into the objectives and priorities of the OPs, and will include more information on what type of financial products should be put in place.

[10] Regulation (EU) No 1303/2013 of the European Parliament and of the Council of 17 December 2013 laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund and laying down general provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund and the European Maritime and Fisheries Fund and repealing Council Regulation (EC) No 1083/2006.

[11] Art. 37(7) CPR

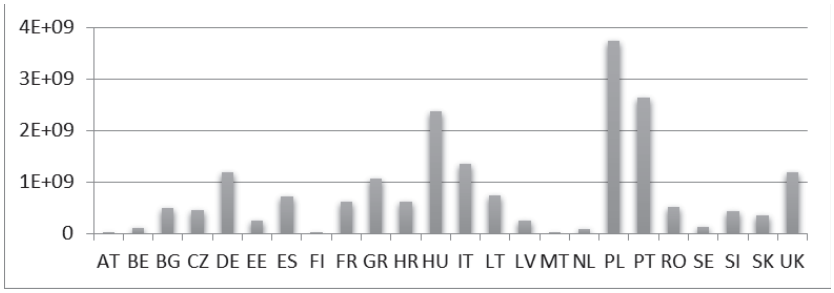


Figure 2: FIs in 2014-2020 period (ESIF in EUR)

Source: Nyikos, data from the EC (downloaded on 9. 7. 2016), OPs adopted by EC[12] [19,20,21,24]

2. The Hungarian case of combination of credit and grant

In the *2007-2013 programming period* Hungary decided to use FIs in order to provide access to finance for SMEs. According to programme documents and AIR 2013; the main objective of FIs was to overcome the limited access of finance on the market, moreover the idea of introducing financial instruments was strongly driven by the assumption that FIs may represent more efficient forms of SME support than grants. The total amount of FIs set up in proportion of the ERDF support was around 6%[13] and mainly the Economic Development Operational Programme financed FIs[14]. [19,22]

Until the end of 2011, only 27.91% of the FI sources had been disbursed to final recipients, but the absorption of resources largely accelerated in the second half of the programme period. The New Hungary Joint Fund (27.62%), the *Combined Microcredit (24.85%)* and the New Széchenyi Loan (18.14%) were the top three "products" with the highest share of the allocated funds. [24]

[12] Nyikos (2016): Research for REGI Committee - Financial instruments in the 2014-20 programming period: First experiences of Member States, European Union, 2016

[13] The financial allocation of the Economic Development Operational Programme's 4th priority (financial instruments) was increased by 3% in 2009 through Operational Programme (OP) modification.

[14] Economic Development Operational Programme 2007-2013. CCI number: 2007HU161PO001. http://www.nfu.hu /umft_operativ_programok.

Ops	Budget of OP (without TA)	FI forms in the OP	FI budget in the OP	FI in % of the OP	FI% of the total ERDF
Economic Development Operational Programme 2007-2013 (EDOP) which covers the convergence regions (6 regions out of 7) [19]	EUR 3,257 million	Credit, Guarantee, VC	EUR 727 million (the total FI priority axis)	22%[15]	5%
Central Hungary Operational Programme[16] 2007-2013 (CHOP) for the Regional Employment and Competitiveness objective [20]	EUR 1,663 million	Credit, Guarantee, VC	ca EUR 117 million (FIs cover part of the 1st priority)	7%	0.7%
6 Regional Development Operational Programmes[17] (RDOP) for the Convergence regions [21]	EUR 4,881 million	VC	EUR 7 million /OP (in Strengthening the region's SME sector priorities)	0.8%	0.3%
ERDF support between 2007-2013					EUR 14,44 1 million 6%

Table 1: FIs in the OPs in Hungary
Source: Nyikos [22]

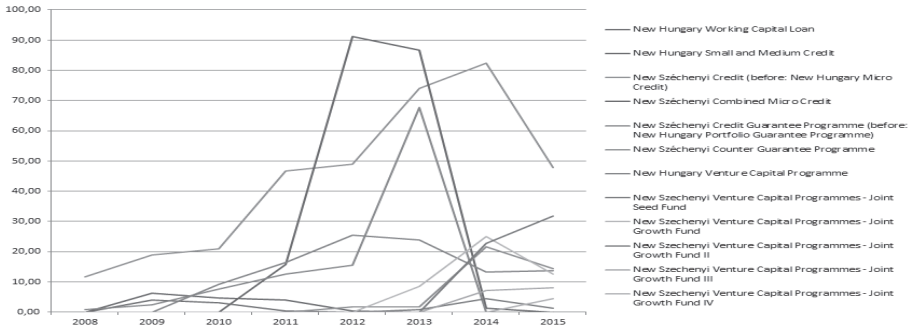


Figure 3: Absorption process of the different Hungarian FIs
Source: Nyikos, data from Fontium, Hungarian Development Bank 2016[18]

Loan was the first[19] financial engineering instrument in Hungary, however since the start the main parameters of the program were changed 3 times as a reaction to the crisis. In 2011 the already functioning loan programmes were supplemented with a new combined loan plus grant scheme. From a state aid point of view, the combined microcredit was granted under the "de minimis" principle[20], where SMEs could get a maximum 45% of the project value[21] as a grant and a

[15] 24% of EDOP sources, in total EUR 703 million, was finally allocated to FIs by 2014 (KPMG 2013; EDOP AIR 2014; EDOP 2007)
[16] Central Hungary Operational Programme 2007-2013. CCI number: 2007HU162PO001. http://www.nfu.hu/umft_operativ_programok
[17] Regional Development Operational Programmes 2007-2013. http://www.nfu.hu/umft_operativ_programok
[18] Nyikos (2016): Research for REGI Committee - Financial instruments in the 2014-20 programming period: First experiences of Member States, European Union, 2016
[19] The calls for tender for the banks and micro financing institutions were launched in October 2007, while the first contracts with the intermediaries were drawn up in December 2007. In January 2008 the first micro credit transactions were carried out.
[20] Under Commission Regulation (EC) No 1998/2006.
[21] or 10 million HUF

maximum 60% of the project value[22] as micro credit and the starting point is that they had to contribute with their own resources amounting to 10% of the total investment. [1] The amount of grant could not exceed the amount of micro credit and application requirements stipulated that applicants had to make 10 % own contribution available, which could not be financed by any other subsidized loan. In the decision process the amount of 10 % own contribution was automatically considered and first the loan amount had to be calculated, and then the remaining gap could be covered as grant in accordance with the conditions of the call. The admission and assessment of loan applications, the disbursement of loans, and the management of loan accounts were carried out by financial intermediaries in a *one-stop-shop system but without unified and integrated IT support.* [24]

In order to implement the JEREMIE programme in Hungary a widespread external intermediary network was set up. Loans have been offered by three types of financial intermediaries *(credit institutions, financial enterprises and local enterprise development agencies)*.

	Number of agreements concluded with financial intermediaries					Type of products			
Financial intermediaries	Dec. 2011	Dec. 2012	Dec. 2013	Dec. 2014	Dec. 2015	Loan	Combined microcredit	Guarantee	Venture capital
Venture Capital Fund Managers	8	18	27	28	29	-	-	-	X
Commercial banks	99	116	119	120	120	X	-	X	-
Financial enterprises	53	76	94	97	97	X	X	-	-
Saving co-operatives / Co-operative saving org.	76	111	134	134	134	X	X	-	-
Microfinance institutions / enterprise agencies	35	35	35	35	35	X	X	-	-
Total	**271**	**356**	**409**	**414**	**415**				

Table 2: Types and number of financial intermediaries
Source: Nyikos, figures from the Hungarian Development Bank, 31 December 2013.[23] [23]

In this system SMEs applied to the financial intermediaries that granted the micro credit part, while the state-owned body decided on the grant after that. The loan and grant part of the financing were inseparable, so if one of the applications was rejected, it meant the automatic rejection of the whole finance. The loans were disbursed first (which pre-supposes that the relevant application for grant has been approved and an assistance document has been issued). These *2 institutions* had to evaluate different aspects of the project, and shared the risks and used *different IT solutions without united workflow and database.*

[22] or 20 million HUF
[23] Nyikos (2016) Financial Instruments for Better Public Spending - Implementing Mechanisms and Effects In: 24th NISPAcee Annual Conference: Spreading Standards, Building Capabilities: European Administrative Space in Progress. Forumi Shqiptar Social Ekonomik (ASET), 2016. p. 22. 22 p

In the *2014-2020 period* 60 % of all ESI Funds will be dedicated to economic development and job creation and with an allocation of EUR 2.3 billion, Hungary is almost tripling its allocation to financial instruments compared with 2007-2013. The use of FIs will be expanded to R&D&I, energy, ICT and the social economy. [17,18,24]

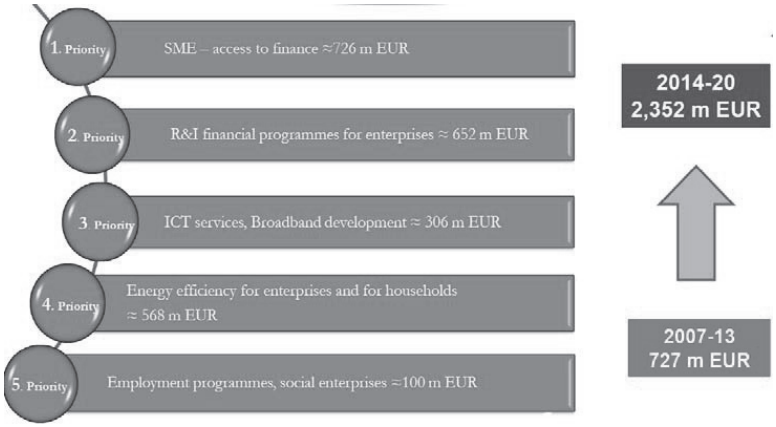


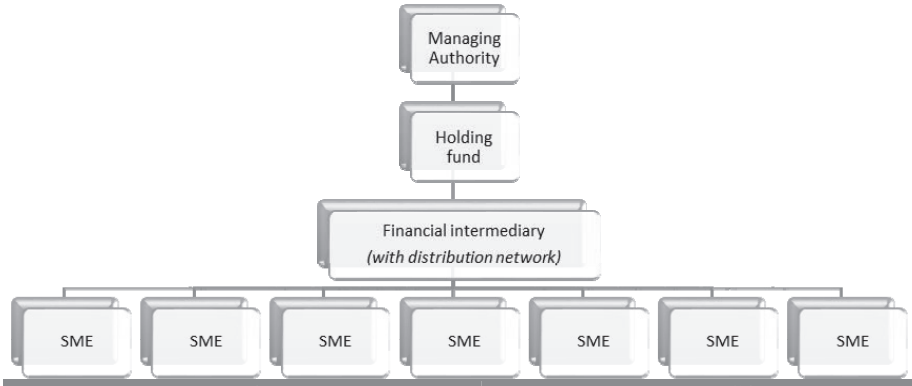
Figure 4: Indicative proportion of financial instruments in EDIOP
Source: Ministry of National Economy 2016 [18, 24]

In Hungary the planned financial instruments are i) credit, leasing and factoring, *ii) combined products,* iii) venture capital programmes and iv) guarantee instruments. Based on the positive experience Hungary intends to continue the use of *combined financial instruments (loan and grant*) in several thematic areas (SME, ICT, R&I, energy efficiency). [18, 24]

However because of the new legal interpretation of the European Commission on the selection of financial intermediaries[24] Hungary had to change the 2007-2013 FI institutional system. Hungary - as a result of several open calls - worked with a widespread external intermediary network in the case of JEREMIE. [11] With the use of public procurement only one winner is possible, even if it is a consortium. The managing authority and the holding fund manager decided to select an intermediary network by public procurement process instead of procuring intermediaries per FIs[25]. The consortium has to provide dedicated bank branches working as access points for standardized financial products using EU sources. [23]

[24] According to the European Commission's new legal explanation, because the Management Authority has to comply with the general principles as well, including when selecting bodies implementing financial instruments: they must comply with applicable law, in particular on state aid and public procurement and the selection of financial intermediaries has to be in line with public procurement law.

[25] Still the PP procedure for the selection of financial intermediaries may potentially decrease in many ways the efficiency of the implementation of financial instruments, because amendments to terms and conditions of financial instruments during the implementation-period (potentially 15 years) cannot be handled under inflexible service contract conditions and it could cause significant implementation issues for private investors and final recipients.



PRO	CON
unified consequent implementation process with IT support	limited or no involvement of private investment sources - because of PP it is financial service for fee
better control and monitoring	conflict of interest linked to own products versus supported loans
standard unified loan product	
credit not depending on the willingness of risk taking of the financial intermediary	

Figure 5: FI institution system: holding fund using PP

Source: Nyikos[26] [23]

Although this new situation caused several obstacles, *it made also possible to consider establishing a united integrated IT system for more effective and efficient implementation process for combined solutions, as described in the following sections.*

3. Integrated solution for combined loans

For the 2014-2020 programming period the basic principle remained: in the combined tools the loan (managed by the financial intermediary) and the grant (managed by the MA) belong together and cannot be separated. However, for a more effective and less time consuming process to be in place the two sides should work parallel. Regarding the IT support of combined products a completely new approach is being applied in the current period. In the previous period applications were submitted personally by final recipients and management tasks were carried out in different IT systems. The new IT solution is based on two main elements: the *eCohesion concept and the integration of business workflows*. These changes are driven by the objective of the reduction of administrative burdens.

As the concept of the combined projects was driven by the fact that they would finance single operations, thus these would not support separate operations with distinct eligible costs, *but the same eligible costs of a selected operation*, therefore consistency of rules and procedures between the two systems had to be created in order to reduce administrative burden and costs. In this context the following challenges had been identified:

- review and consolidation of the process of project assessment tasks on both sides, namely the managing authority and the financial intermediary, in order to avoid duplication of tasks,

[26] Nyikos (2016) Financial Instruments for Better Public Spending - Implementing Mechanisms and Effects In: 24th NISPAcee Annual Conference: Spreading Standards, Building Capabilities: European Administrative Space in Progress. Forumi Shqiptar Social Ekonomik (ASET), 2016. p. 22. 22 p

- harmonization of eligibility criteria set by the managing authority for grants and the eligibility criteria set by the holding fund manager for granting support from financial instruments,

- consolidation of the application data required from the applicants in line with the above mentioned aspects.

Despite the experience gained from the previous period to respond to these challenges, it took 9 months for the managing authority, the body implementing the fund of funds and the IT team[27] to establish a functioning IT system for combined projects. The two main reasons for this delay were that, all parties had to review their own rules and procedures and by doing so, they had to abandon old, unreasonable *habits* of institutional heritage (e.g. limited publicity of selection criteria in the case of financial instruments). Secondly, although it had been obvious at the very beginning, that the implementation systems of grants and financial instruments differ in many ways, it was quite shocking how crucial difficulties as a consequence may occur (e.g. investments that are to be supported through financial instruments shall not be physically completed or fully implemented at the date of the investment decision, while managing authorities of grants not only allow for, but very often use retrospective financing).

In line with the Hungarian implementation rules, Gov. Decree No. 272/2014, *project evaluation* consists of two main phases:

- eligibility assessment of the applicant and of the project proposal,

- technical assessment of the project proposal in accordance with the selection criteria.

As a rule of thumb, the managing authority was made responsible for the eligibility assessment of the operations, as majority of the eligibility criteria set by both parties proved to be similar in line with the governing cohesion policy implementation and state aid rules and thus, duplicate assessment could be avoided. . [5, 6, 7, 8, 13]

However, some eligibility criteria remained specific for the financial instruments, i.e.

- whether the applicant has tax debts or is subject to debt settlement proceedings and whether the applicant has any arrears of any past financial transactions (as these factors indicate a low level of willingness for repayment), and

- whether the proposed operation consists of physically completed or fully implemented parts (as this would be discrepant with the overall purpose of financial instruments, namely hat financial instruments shall support investments which *do not give rise to sufficient funding from market sources*).

Technically it means that the financial intermediaries examine the eligibility criteria linked to the above mentioned aspects only, besides they perform a credit scoring for assessing the qualification for the loan and for determining the creditworthiness of the applicant and the corresponding loan margins[28]. [2]

[27] despite the close cooperation and the weekly Task Force meetings

[28] in line with "Communication from the Commission No. 2008/C 14/02 on the revision of the method for setting the reference and discount rates"

Therefore only those project applications that qualify as eligible by the managing authority *and* by the financial intermediaries with respect to the above mentioned criteria can be further assessed.

Due to the above mentioned fact, the dominance of the management authority in the process, a *single document of call for proposal* is used for combined projects, which thematically follows the template that is used for grants. However, specific building blocks were added for financial instruments, e.g.

- a commitment period for the loan - the period in which the loan can be disbursed – was defined and set generally to 12 months, beginning from the physical completion of the operation,
- specification of the grace period,
- terms of repayment,
- specification of acceptable forms of guarantees etc.

Some terms of financing had to be harmonized between grants and financial instruments (e.g. conditions relating to a property affected by the development) too. These differences were based on the fact that the Hungarian Development Bank as holding fund manager is using its own terms and rules for loans that are based on banking conventions.

Furthermore, as a single call for proposal is used for combined projects, *a single application form* was created. This application form consists of all data that is necessary from the beneficiary for the assessment of qualifying for the loan and the grant. For the set-up this form had to align the data needs of both parties due to over-lapping. This process covered not only the selection of duplicate data, but an accurate specification of data formats as IT systems run with pre-defined data checking and any deviation may have caused a blocking of the IT data processing processes. In some cases, data transformations resulted in partial reprogramming of the IT system used for financial instruments. Anyway, this task was worthwhile and necessary as it substantially reduced the administrative burden of beneficiaries.

Regarding the technical assessment of the process it was necessary to lay down a strict demarcation of tasks between the parties. According to that, financial intermediaries perform the examination of the collateralization and viability-check of the project (the latter is carried out by cash-flow calculations based on estimated data provided by the applicant). All other assessments (compliance with the operational programme, contribution to thematic objectives, relevance and constitution of project budget etc.) are carried out by the managing authority. It is also important to mention that managing authorities use a ranking among project proposals according to the selection criteria, while financial intermediaries do not rank the projects; they only decide whether the project proposal is up to the mark according to the collateralization- and viability-check. This system not only reduces the number of iterations between the managing authority and the financial intermediary, but also eliminates the possibility of inconsistent results of technical assessment, which would require the involvement of a third party for making a final decision.

However, an iteration step could not be avoided. As the calculation of state aid completely differs between the two regimes, it is the financial intermediary who makes a first decision during the technical assessment: if the project is viable and collateralization is adequate, the financial

intermediary calculates (taking into account the results of collateralization and the result of creditworthiness of the eligibility assessment) the amount of state aid of the loan, notifies the managing authority, which then assesses whether the project budget (loan + grant) complies with aid intensity rules. If the reduction of the budget is necessary, the managing authority proportionally reduces the amount of grant and loan as well, and based on its proposal, the financial intermediary makes a final credit decision on the reduced loan.

Based on the final credit decision, the managing authority makes its final decision on the project proposal with regard to the grant. This means that a project will be financed only, if both parties give the green light.

During the *contracting and payment processes* both parties follow their own rules of procedures. Therefore, the financial intermediaries enter into a loan contract and the managing authority enters into a contract for the grant with the beneficiary. However, the main parameters of the projects cannot be modified by the beneficiaries in the interval between the positive decisions on the project and concluding the contracts.

Payment requests will be submitted by the beneficiaries to the managing authority, which examines the original copies, while financial intermediaries examine electronic copies of that. Both parties follow their own rules of eligibility of payments. As soon as both parties approved the payment request and the corresponding amount, payment instalments will be financed *proportionally to the loan-grant ratio of the project* by both parties according to their own procedures. This means that the beneficiaries receive two money transfers for the same eligible cost. This also means that loan is not paid in advance, but together with the grant, which is usually disbursed ex-post.

4. eCohesion: a new perspective

According to the concept of the new IT solution applicants can submit a single application form only electronically using a one-stop-shop portal (https://eptk.fair.gov.hu/) to apply for combined loans. This online portal has been available since 2014 and it serves to support the management of all types of EU funded projects. On this portal, applicants can register a single funding account and manage all their projects with this account.This solution is based on the implementation of the eCohesion concept which can significantly contribute to the efficiency of funding procedures.

In 2010 the European Commission initiated an Action Programme to simplify administrative requirements and eliminate unnecessary administrative burdens on businesses, small businesses in particular. Cohesion policy was one of the priority areas of the Action Programme with an estimated 24% reduction of administrative costs. According to arguments of experts this level of reduction could be realised by the provision of interactive portal services where beneficiaries can submit all necessary information electronically. This concept contributes to the improvement of efficiency which is the main driver of the reduction of burdens.

Following the above recommendations, the Commission launched an initiative focusing on the reduction of administrative burdens of cohesion policy and also rural development policy by the provision of electronic data exchange services via online portals. The initiative was labelled as “e-Cohesion” addressing a wide range of legal, procedural, organisational factors. [14]

Regulation 1303/2013 of the European Parliament and of the Council specifies the three fundamental components of e-Cohesion. The provision of *electronic data exchange services,*

interoperability and the implementation of *the only once encoding principle* ensure the reduction of administrative burdens. [5]

Electronic data exchange services allow the electronic exchange of documents and data, including audiovisual media supports, scanned documents and electronic files. Pursuant to the above regulation Member States shall ensure that all exchanges of information between beneficiaries and the relevant authorities can be carried out by means of electronic data exchange systems.

Regulation 1011/2014 prescribes that electronic data exchange systems shall be equipped with at least the following functionalities: interactive forms and/or forms prefilled by the system, automatic calculations, automatic embedded controls which reduce repeated exchanges of documents or information, system-generated alerts, online status tracking. These functions are directly linked to the reduction of burdens and the issue of efficiency. [9]

As regards the "*only once encoding*" principle, data and documents regarding a single development project shall be shared and re-used by the authorities involved in the management of the same development programme. The relevant authorities cannot ask for the same data repeatedly. The application of the principle minimises multiple information requests and facilitates the reduction of administrative burdens by streamlining business workflows. [5]

The application of the principle is based on the cooperation of relevant authorities, so it is strongly interlinked with *interoperability*. Interoperability can be defined as "the ability of disparate and diverse organisations to interact towards mutually beneficial and agreed common goals, involving the sharing of information and knowledge between the organisations, through the business processes they support, by means of the exchange of data between their respective ICT systems". Henceforth, interoperability is not simply a technological issue. It requires the cooperation of authorities at legal, organisational, semantic and technical levels. [3]

The case of combined products clearly exemplifies the importance of these levels. The managing authority and the financial intermediary had to consider all these levels to realize a successful cooperation. The two organisations need to implement the same government decree (*legal*), they had to review and streamline business procedures (*organisational*), harmonize financial terms (*semantic*) and started the development of an integrated IT solution (*technological*).

The fundamental components of eCohesion are strongly connected to the issue of efficiency. According to the study of the Commission and Deloitte, eCohesion portals at their highest level of sophistication can reach 8% per annum reduction of administrative burdens. [15]

5. The integration of grant and loan management workflows

Driven by the concept of eCohesion final recipients have to use a one-stop-shop portal which is technically an online portal automatically synchronizing with the grant management system used by the managing authority. Since grant management and banking procedures both have a rather specific nature, accordingly the managing authority and the financial intermediaries use specialized IT systems to manage grant-specific and loan-specific sub-procedures. The relevant data of loan-specific workflows are taken to the loan management system of the intermediaries.

However, following the only once encoding principle the financial intermediaries also need to interact via the eCohesion portal with the recipients, so the management workflows of the two

parties had to be integrated. To keep specific workflows on the same track, main procedural information and decisions are entered in the managing authority system by both parties. To make the cooperation of the actors seamless, they are notified by email alerts on each other's' actions to trigger upcoming workflow steps.

The applied solution is based on the process analysation and synchronization showed before and depicted by Figure 6.

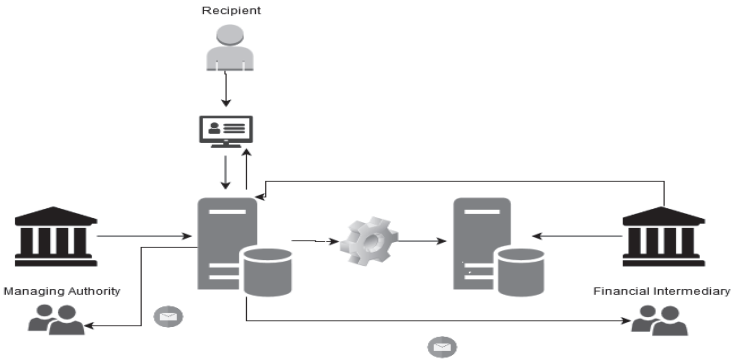


Figure 6: IT systems and business workflows in the 2014-2020 period
Sources: Authors

The implementation of the complete IT solution has several phases. The first phase covers the procedure of project selection, and its portal functionality has been available since January 2017. The planning of further phases covering other business procedures is in progress at the time of the publication of this paper.

The integration procedure had three main challenges: the type of data transfer between the two systems; the definition of a common workflow and the notification of the two parties on the actions of each other. Taking into consideration the differences between the two IT systems, the complexity of possible solutions and the given deadlines to launch the first combined calls, automatic and complete data synchronization was not an option, so the development team adopted a specific approach. They decided to establish a one-way data interface which transmits the main application data to the system of the financial intermediaries. These are the data needed for assessment procedures.

As business procedures of the two parties were harmonized, many procedural steps can be carried out in parallel. Nevertheless, at crucial procedural points, parties have to wait for each other. Firstly, certain procedural decisions cannot be passed without the results of specific procedures on the other side. Secondly, several interactions with the recipient (correction request, clarifying questions) can be realized only once so they should be based on the information needs of both organizations. Based on these requirements the two parties need to be notified of the completion and the results of actions on the other side. The above one–way data interface cannot support this kind of information exchange, however.

This dilemma was resolved by granting access for the financial intermediaries to relevant functions in the grant management system. Besides, certain dedicated functions for intermediaries were developed, where they can enter and save the main results of their relevant actions. The usage of these relevant functions always triggers notifications to inform the other on the completion of

preceding actions. These measures provide a solution for sharing information between the two organisations.

6. Conclusion

Following the new conditions given by the new cohesion regulation and the European Commission legal interpretations, the demand for the uniform standards and management methods of the new FIs is pushing the structure in several cases (also in the case of Hungary) to different solutions from what were used before. This new direction could be an effective solution. However, even with the change of the FI architecture the incorporation of experiences is very important, the need for expertise and administrative capacity is crucial. Accordingly, the challenges to be faced require higher and high-qualified management resources in order to mitigate risks and accomplish the goals set out by the policy plans.

Setting up financial instruments and an implementation system of combined products take long time and effort, in Hungary even with experience of implementation in these kinds of tools it took 9 months to establish a functioning implementation system. In the context of the Hungarian system of combined projects, financial instruments are still treated as complementary financial resources. This approach is also evidenced in the way how the tasks of combined projects' assessment have been allocated between the managing authorities dealing with grants and the financial intermediaries dealing with loans. In this sense, financial intermediaries are rather like subsidiaries. The main advantage of the new system is, however, that it allows for a preparation for future expectations that is the domination of financial instruments in SME financing, by making beneficiaries and managing authorities more experienced.

Compared to the practice of the previous period, the Hungarian integrated solution can place the management of combined products on a higher level of maturity. The eCohesion-based management has a great potential to eliminate unnecessary burdens and provide a flexible tool for recipients without timely and geographical limits. The main lesson learned is that the application of the one-stop-shop approach triggers the rationalization of business procedures and the integration of IT workflows. This redesigning of the process can also contribute to a further reduction of burdens.

7. References

[1] EUROPEAN COMMISSION, Commission Regulation (EU) No 1998/2006 on on the application of Articles 87 and 88 of the Treaty to de minimis aid, in: Official Journal of the European Union, Bruxelles, 2006.

[2] EUROPEAN COMMISSION, the revision of the method for setting the reference and discount rates; (2008/C 14/02), Bruxelles, 2008.

[3] EUROPEAN COMMISSION, European interoperability framework EIF) for European public services (Pages 1, 2), in: Official Journal of the European Union, Bruxelles, 2012.

[4] EUROPEAN COMMISSION, Regulation (Eu, Euratom) No 966/2012 of the European Parliament and of the Council of 25 October 2012 on the financial rules applicable to the general budget of the Union and repealing Council Regulation (EC, Euratom) No 1605/2002; "financial instruments" means Union measures of financial support provided on a complementary basis from the budget in order to address one or more specific policy

objectives of the Union. Such instruments may take the form of equity or quasi-equity investments, loans or guarantees, or other risk-sharing instruments, and may, where appropriate, be combined with grants", in: Official Journal of the European Union, Bruxelles, 2012.

[5] EUROPEAN COMMISSION, Regulation (EU) No 1303/2013 of the European Parliament and of the Council of 17 December 2013 laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund and laying down general provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund and the European Maritime and Fisheries Fund and repealing Council Regulation (EC) No 1083/2006., in: Official Journal of the European Union, Bruxelles, 2013.

[6] EUROPEAN COMMISSION, Commission Delegated Regulation (EU) No 480/2014 of 3 March 2014 supplementing Regulation (EU) No 1303/2013 of the European Parliament and of the Council laying down common provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund, the European Agricultural Fund for Rural Development and the European Maritime and Fisheries Fund and laying down general provisions on the European Regional Development Fund, the European Social Fund, the Cohesion Fund and the European Maritime and Fisheries Fund., in: Official Journal of the European Union, Bruxelles, 2014.

[7] EUROPEAN COMMISSION, Commission Regulation (EU) No 651/2014 on declaring certain categories of aid compatible with the internal market in application of Articles 107 and 108 of the Treaty (GBER).,in: Official Journal of the European Union, Bruxelles, 2014.

[8] EUROPEAN COMMISSION, Commission Implementing Regulation (EU) No 964/2014 of 11 September 2014 laying down rules for the application of Regulation (EU) No 1303/2013 of the European Parliament and of the Council as regards standard terms and conditions for financial instruments., in: Official Journal of the European Union, Bruxelles, 2014.

[9] EUROPEAN COMMISSION, Commission implementing regulation (EU) No 1011/2014 laying down detailed rules for implementing Regulation (EU) No 1303/2013 of the European Parliament and of the Council as regards the models for submission of certain information to the Commission and the detailed rules concerning the exchanges of information between beneficiaries and managing authorities, certifying authorities, audit authorities and intermediate bodies, in: Official Journal of the European Union., Bruxelles, 2014.

[10] EUROPEAN COMMISSION, An Investment Plan for Europe; COM(2014) 903 final, Bruxelles, 2014.

[11] EUROPEAN COMMISSION, Guidance for Member States on the selection of bodies implementing FIs, including funds of funds., Bruxelles, 2015.

[12] EUROPEAN COMMISSION, Investing in jobs and growth - maximising the contribution of European Structural and Investment Funds, COM(2015)639final, 14.12.2015, Bruxelles, 2016.

[13] EUROPEAN COMMISSION, Mid-term review/revision of the multiannual financial framework 2014-2020; COM(2016) 603 final, Bruxelles, 2016.

[14] EUROPEAN COMMISSION, COCOF note on financial engineering instruments from (COCOF/07/0018/01), (COCOF 08/002/03), (COCOF 10/0014/004), (COCOF 10/0014/05), Bruxelles, 2007-2010.

[15] EUROEAN COMMISSION, Draft opinion of the High Level Group, Administrative burden reduction; priority area Cohesion Policy, second opinion - eCohesion Policy (Pages 3-5), Brussels 2011. Viewed 5 January 2017, [online]. http://ec.europa.eu/smart-regulation/refit/admin_burden/docs/120430_opinion_ecohesion_en.pdf

[16] EUROEAN COMMISSION, eGovernance study at EU / Member State level, Draft final report by Deloitte, (Pages 14 – 15, 48), Brussels 2012. Viewed 5 January 2017, [online]. http://ec.europa.eu/agriculture/external-studies/2012/e-%20government/fulltext_en.pdf

[17] EUROPEAN COMMISSION, Partnership Agreement for Hungary, 2014-2020, Bruxelles, 2014.

[18] EUROPEAN COMMISSION, Hungarian Economic Development and Innovation OP 2014-2020, Bruxelles 2015.

[19] EUROPEAN COMMISSION, Hungarian Economic Development Operational Programme 2007-2013. CCI number: 2007HU161PO001, Bruxelles, 2007.

[20] EUROPEAN COMMISSION, Central Hungary Operational Programme 2007-2013. CCI number: 2007HU162PO001, Bruxelles, 2007.

[21] EUROPEAN COMMISSION, Regional Development Operational Programmes 2007-2013, Bruxelles, 2007.

[22] NYIKOS, The Role of Financial Instruments in Improving Access to Finance, Combined Microcredit in Hungary EStIF 2|2015.

[23] NYIKOS, Financial Instruments for Better Public Spending - Implementing Mechanisms and Effects In: 24th NISPAcee Annual Conference: Spreading Standards, Building Capabilities: European Administrative Space in Progress. Forumi Shqiptar Social Ekonomik (ASET), p. 22. 22 p., 2016.

[24] NYIKOS, Research for REGI Committee - Financial instruments in the 2014-20 programming period: First experiences of Member States, European Union, 2016.

Identity Management

MAY THE ADVANCED BIOMETRIC ELECTRONIC SIGNATURE BE APPLICABLE IN PUBLIC ADMINISTRATION?

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Abstract[3]
Electronic signature is a technology-neutral collective noun. Therefore, several different implementations compose the known types of electronic signatures. Many classifications may be defined, for instance from technological and legal aspects. In reference to acceptability, legal status of a given signature seems to be the most important attribute for transaction partners in the e-Administration. Full probative force is usually required by Public Administration and it is also a need for building trust between untrusted partners. It can be achieved by the well-known qualified electronic signature. The qualified signature creation method requires a secure qualified electronic signature creation device and qualified certificate, although in many cases a simpler but still secure signature is also able to fulfil legal requirements ensuring the validity of transactions. On the citizen side, device dependency and relating costs were considered the major obstacles against overall usage of electronic signature technology between 2005 and 2015. Our paper intends to argue that creating advanced electronic signature is not impossible by using the signatory's biometric data and it may also be an optionally client-friendly, but not a device-free part of the e-Administration, beside the citizen card.

1. Can the human signature be used for signature or not?

Electronic signature is a widely used and misused collective noun. Unfortunately, it has a lot of definitions, which have implied a lot of different implementations. It covers the normal (paper based) signature, which is scanned into a file, a typed name in the tail of an e-mail as well as the electronic signature which is created by cryptographically computed signature creation data stored on a secure qualified electronic signature creation device. Here we discuss electronic signatures, which are attached electronically to a document. The connection between signature and document may be both physical and logical. We have to mention that the meaning of electronic data has a tight interpretation - which is used -, and a wider interpretation - which is not used - nowadays. The tighter meaning contains only digital electronic data, and the wider meaning contains non-digital but electronical data also (e.g. autopen [4]).

There are two mainstream implementations of electronic signatures today. One is based on Public Key Infrastructure (PKI). The main idea is that the signer has two different keys combined mathematically, that is a key-pair. The first key is the private key, which is used to sign a document and it is secret for anyone else. The other key of this key-pair is the public key, as is in the name of this technology. It can be used by anyone to check whether the secret key's owner was the person,

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who has signed the received document or not. Two trust models apply to the PKI technology, the "Web of Trust" and the "Trusted Third Party" model. In the second model, there must be a third party who confirms that the personal key and the physical person belong together. It supposes the correct identification of the natural person.

What about the second implementation? A number of companies implemented biometric signatures as a simple tool of gathering clients' consent or acceptance. The signature creation data may be other than a public key if eIDAS regulation[4] is really technology-neutral legislation. We argue in this paper that biometric characteristic or parameters can also be used as signature creation data corresponding to the "secret key" in the PKI world. In this case the signer's biometric parameter is used (and attached to) the document. In the most widely used solutions electronic picture of the human signature is usually the only applied biometric parameter for the signature. Another is the usage of the fingerprint, voice, palm print, iris or several other known biometric attributes that authenticate a natural person who is physically present [6]. We have used biometry long time ago. The present paper extends the concept of human signature to the signature created in any appropriate electronic devices. We state there are no legal and technical obstacles to advanced biometric signatures as a valid subset of biometric signatures. In this case, electronic signature does not mean only the graphical appearance as visible on a facsimile. We argue that proper biometric signatures shall contain additional features also in connection with a human signature to fulfil the requirements of advanced electronic signature. For instance, the data of dynamism, speed and pressure recorded with a very high sampling rate are unique for everyone. There is another side of the uniqueness. Theoretically nobody can create the same signature twice or more. However, it requires applying different method for the appropriate validation processes.

2. Definitions of electronic signature

We can group the definitions of electronic signature into two classes, legal and technological. We argue that both definitions can be applied to human biometric signatures. These two system of concepts are really different, legislators payed attention to use definitions in regulation be different from terms in existing technological standards. This leads to the statement that a legal definition may related to multiple technological terms, namely signature creation data may be several private keys (e.g. RSA 1024, RSA 2048, RSA 4096 [9], ECDSA 128 [2]) and a set of biometric attributes also.

2.1 Technical definitions and a classification

We use the following terms in the technical meaning indicated below:

1. implementation of electronic signature: special electronic data attached to a document usually in connection with undertaking a commitment and used for the authentication of the signatory in order to enable accountability of the undertaking of the commitment.

2. human signature: a signature created by a given person by a specific tool (pen or pencil) or perhaps by a finger.

[4] Regulation (EU) No 910/2014 of the European Parliament and of the Council of 23 July 2014 on electronic identification and trust services for electronic transactions in the internal market and repealing Directive 1999/93/EC

3. biometric electronic signature: signature created by a human signature produced on an electronic device capable to record and process biometric data in digital form.

4. electronically saved signature: a human signature which is captured and stored by a device electronically.

The most important difference between biometric electronic signature and electronically saved signature is that saved signature means only a recorded and reusable version of human signature, while biometric signature contains other biometric data characterized by the human signature, which can be processed and used for validation. In this aspect, signature of an autopen belongs to the class of electronically saved signatures. The relations between these definitions is shown below.

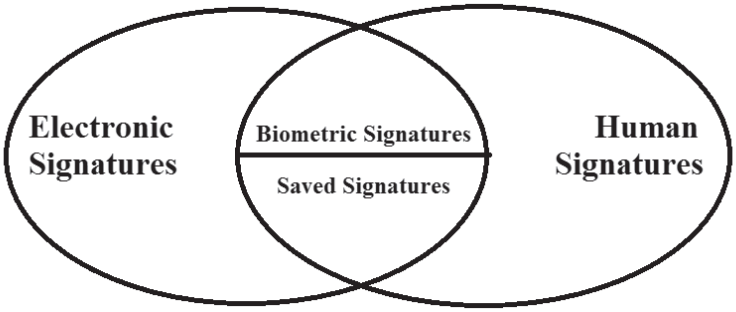

Figure 1. Electronic Signatures and Human Signatures (source: the Authors)

2.2 Legal definitions

After July 1 of 2016 the best starting point to analyse legal definitions of electronic signatures is the eIDAS Regulation in the European Union. eIDAS is the regulation for the electronic identification and trust services as issued on 23 July 2014. It repealed the Directive No. 1999/93/EC[5]. Between 1999 and mid of 2000 all Member States had created own slightly different legislation in national level, but all of them were replaced by eIDAS, which is mandatory for all Member States (and for all citizens) as an act. The eIDAS differentiates several levels of electronic signatures. We examine the following definitions of eIDAS:

1. electronic signature means data in electronic form which is attached to or logically associated with other data in electronic form and which is used by the signatory to sign.

2. advanced electronic signature means an electronic signature which meets the requirements set out in Article 26". Article 26 contains four requirements: (a) it is uniquely linked to the signatory, (b) it is capable of identifying the signatory, (c) it is created using electronic signature creation data that the signatory can, with a high level of confidence, use under his sole control; and (d) it is linked to the data signed therewith in such a way that any subsequent change in the data is detectable.

[5] Directive 1999/93/EC of the European Parliament and of the Council of 13 December 1999 on a Community framework for electronic signatures

3. qualified electronic signature means an advanced electronic signature that is created by a qualified electronic signature creation device, and which is based on a qualified certificate for electronic signatures.

Similar definitions exist regarding to seals. In technological aspect, electronic seals and electronic signatures are the same, only the types of the subject are different. Signatory has been always a natural person, who is able to create electronic signature. A legal person can make only a seal according to the eIDAS terminology. Signing for legal persons is forbidden, sealing is allowed. However, Public Administration should be familiar with both concepts because public clerks and authorities may sign and seal documents, orders, decrees and any other electronic information in daily work processes, similarly to clients. As regards seals, biometric electronic signature can be created only by humans, and therefore the term of "biometric electronic seal" does not make sense. However, three different levels of electronic signatures are defined in eIDAS regardless the methods of implementation. Consequently, it should be noted that the definitions above are absolutely technology-neutral, i.e. independent from technologies. This means that the existence of advanced biometric electronic signature or qualified biometric electronic signature cannot be excluded theoretically, and it can be derived from law. On the other side, the content of biometric certificate has not been defined and standardized yet.

3. eIDAS in the EU

Why eIDAS is so important for Public Administration? There are two reasons. The eIDAS improves cooperation in the internal market by a commonly used and enforced legislation. In most cases, citizens cannot use their electronic identification to authenticate themselves in another Member State because the national electronic identification schemes in their country are not recognized by others. Mutually recognized electronic identification means will facilitate cross-border provision of numerous services in the internal market and enable businesses to operate on a cross-border basis without facing many obstacles in interactions with public authorities. One of the objectives of the eIDAS is to remove existing barriers to the cross-border use of electronic identification means used in the Member States to authenticate, for at least public services. It means that the first important aim of the Regulation is to ensure that for access to cross-border online services offered by Member States, secure electronic identification and authentication is possible.

The second important focus of the eIDAS is that the Regulation should establish the principle that an electronic signature should not be denied legal effect on the grounds that it is in an electronic form or that it does not meet the requirements of the qualified electronic signature. However, it is for national law to define the legal effect of electronic signatures, except for the requirements provided for in this Regulation according to which a qualified electronic signature should have the equivalent legal effect of a handwritten signature. In the Member States authorities currently use different formats of advanced electronic signatures to sign their documents electronically. It seems to be necessary to ensure that at least a number of advanced electronic signature formats can be technically supported by Member States when they receive documents signed electronically. Similarly, when competent authorities in the Member States use advanced electronic seals, it would be necessary to ensure that they support at least a number of advanced electronic seal formats. Consequently, according to the eIDAS, only such solutions can be used cross-border which are examined and accepted by affected Member States as it is defined by Article 27 and 37 of eIDAS. If a Member State requires an advanced electronic signature to use an online service offered by, or on behalf of, a public sector body, that Member State shall recognize advanced electronic signatures, advanced electronic signatures based on a qualified certificate for electronic signatures, and

qualified electronic signatures in at least the formats or using methods defined in the appropriate implementing acts[6]. Although the Commission has already defined the reference formats of advanced electronic signatures or reference methods where alternative formats are used by an implementing act[7], the biometric references are missing from these methods.

4. Legal Effect of Biometric Signature

There is a most general legal effect regarding to all electronic signatures, the non-repudiation as evidence: "An electronic signature shall not be denied legal effect and admissibility as evidence in legal proceedings solely on the grounds that it is in an electronic form or that it does not meet the requirements for qualified electronic signatures."[8] All Member States are bound to give a qualified electronic signature an equivalent legal effect of a handwritten signature. It was proved that the biometric signature is a variety of electronic signature, therefore the most general legal effect is considered valid in this case. National legislations may contain further rules for applying different electronic signature. For instance, Hungarian Act 237 of 2013 for credit institutions and financial enterprises allows signing contracts between clients and institutions with at least advanced electronic signature also[9]. The specified standards in the referred implementation act state that all specified signature formats in standards[10] fulfill the requirements of advanced electronic signature and seal. eIDAS accepts that technologies may change from time to time and existing standards may not eligible in the near future especially in the field of security. Therefore, it declares that IT security certification based on international standards such as ISO 15408 and related evaluation methods and mutual recognition arrangements is an important tool for verifying the security of qualified electronic signature creation devices, and it should be promoted. However, innovative solutions and services such as mobile signing and cloud signing rely on technical and organizational solutions for qualified electronic signature creation devices for which security standards may not yet be available. The level of security of such devices could be evaluated by using alternative processes only where such security standards are not available. The applicable processes should be comparable to the standards for IT security certification as their security levels are equivalent. It means that comparable alternative processes may use to ensure the achievement of related requirements. So, an alternative evaluation method for advanced biometric signatures may exist and can be accepted widely. The question arises whether an open biometric signing methodology can be defined or not [3].

In any case, a Spanish trust service provider declared that they implemented a voice based advanced biometric signature system[11]. There are no more evidences for proving this statement but examining the related underpinning evidences will be interesting. It seems to be the case that electronic signatures and advanced electronic signatures may be created using biometric methods. But there is a lack of related standards and description of evaluation processes in aspect of electronic signatures. Numerous standards are available regarding to recording, transporting and storing different biometric data such as written sign, fingerprint and voice. Processing technology of biometric data

[6] Article 27 (1) of eIDAS
[7] Commission Implementing Decision (EU) 2015/1506 of 8 September 2015 laying down specifications relating to formats of advanced electronic signatures and advanced seals to be recognized by public sector bodies pursuant to Articles 27(5) and 37(5) of Regulation (EU) No 910/2014 of the European Parliament and of the Council on electronic identification and trust services for electronic transactions in the internal market
[8] Article 25 (1) of eIDAS
[9] Paragraph 279 (1) of Act No. 237 of 2013
[10] CAdES, PAdES and XAdES
[11] http://certifiedsignature.eu/2016/09/25/firvox-first-voice-based-certified-electronic-signature/

is developed and used widely as digital data. Connection between this data and electronic signatures is not fully developed yet [7], [8]. The Hungarian Association for Electronic Signature has issued a professional opinion of applying and using biometric signatures, which declares that most of biometric signatures do not fulfill the requirements of advanced electronic signatures, and therefore require additional measures [1]. Researchers developed combined methods, which combined public key cryptography (PKI) with biometric data and they stated that the combination of PKI and biometrics can offer a more secure mechanism, in that private keys can be generated directly from the biometric scan [5].

Finally, we should mention a method which we commonly used in the past and is still generally accepted as handwritten signature in case of quick authentication and signature for long distance. Of course, this is the facsimile, in brief fax, with several benefits and a number of security problems. But we have to distinguish between biometric signature (electronically captured and attached human signature) and the human signature which is scanned and stored in an electronic file. Fax is a good example for the second one. Both private and public sectors have accepted this method, in spite of the fact, that it is susceptible to fraud. The reasons of the acceptance were the rapidity and effectivity of the method. Security risks seem to be manageable in most of cases.

5. Conclusions

We have attempted to discuss biometric signatures in three dimensions: the legal, technical and business aspects were discussed theoretically. On the other hand, we have examined some existing solutions to find good or bad examples of advanced electronic signatures. We have inspected the implemented biometric signature solutions of Hungarian Post Office Logistic Company, T-points of Hungarian Telekom, Vodafone, Deutsche Post and DHL. None of them comply with the requirements of advanced electronic signature as defined by eIDAS. These solutions have several advantages on business side, because these are very cheap and efficient as well as do not require any tools on the client side, but the usage of these may be limited because there are not any known court practices in this field, and therefore certain legal risks may occur by owners in case of a legal dispute, a litigation.

The biometric electronic signature can be used as normal electronic signature until creation and validation methods of advanced biometric signatures will be standardized and widely accepted in the EU. Without cross-border acceptance procedures it may be used only at national level if related legislations will be developed for Pubic Administration. This solution can involve citizens without e-signature capabilities to e-Administration in an easy and effective way. Effectivity can be enhanced by integrating e-signature and biometric signature devices in Public Administration.

Finally, the ultimate answer to the question, whether human signature can be used for signing in Public Administration, is “yes”. But it still requires significant developments and additional cost-benefit analyses.

6. References

[1] HUNGARIAN ASSOCIATION FOR ELECTRONIC SIGNATURES, Issue Of Applying Biometric Electronic Signatures, Budapest, 2016.

[2] LENSTRA, H.W. Jr.: Factoring Integers with Elliptic Curves, in: The Annals of Mathematics, 126/3, 1987, pp. 649-673.

[3] MANN, D., GUPTA, S., SHARMA, A. and AKHTAR, S.: Digital Signature Using Biometrics, in: Proceedings of the World Congress on Engineering and Computer Science 2015 Vol I, San Francisco, USA, 2015.

[4] MCCARTHY, J. and WINCHESTER, J.: The Autopen, in: Journal of Forensic Sciences, 18/4 (1973), pp. 441-447.

[5] MOHHAMADI, S. and ABEDI, S.: ECC-BASED BIOMETRIC SIGNATURE: A NEW APPROACH IN ELECTRONIC BANKING SECURITY, In: International Symposium on Electronic Commerce and Security, 2008.

[6] NIST, Special Publication 800-63-2, Electronic Authentication Guideline, USA, 2013.

[7] ORVOS, P., SELENYI, E. and HORNYAK, Z.: Usage Of Biometric Identification For Creating Authentic Digital Signatures, in: Networkshop 2001 Conference, Sopron, 2001.

[8] ORVOS, P., SELENYI, E. and HORNYAK, Z.: Towards Biometric Digital Signatures, in: Networkshop 2002 Conference, Eger, 2002.

[9] RIVEST, R.L., SHAMIR, A. and ADLEMAN, L.: A Method for Obtaining Digital Signatures and Public-Key Cryptosystems, in: Communications of the ACM. 21/2 (1978), pp. 120–126.

eIdentification – Renewable Regulated Electronic Administration Services

Anna Orbán[1] and Annamária Beláz[2]

Abstract
Since 2005, Hungary has a comprehensive central identification solution. The Client Gate is capable of identifying citizens for any public authority that connects to it. The Client Gate is very popular and useful tool for identification among citizens for electronic transaction. Today approximately 2.4 million clients have a Client Gate account. However, many have an aversion towards the online administration. They can choose the personal administration or they can use their mobile phone for administration.

Since the beginning of 2016, the new electronic ID card integrates personal identification, social security and tax identification information which is also suitable for providing an electronic signature. These two new identification options are available to citizens, including the newly introduced national eID card, as well as the Partial Code Telephone Authentication. A half years about a million new eID card has been claimed for the citizens. However, the telephone authentication is less popular.

In Hungary, the new electronic administration is based on the "Regulated Electronic Administrative Services" (Hungarian short name SZEÜSZ) since 2012. The new central identification solution, the Central Authentication Agent as one of the Regulated Electronic Administrative Service has been launched that supports the use of different electronic identification and authentication services. Now the usual Client Gate has been changed to the Central Authentication Agent in Web Assistant application to implement full electronic administration procedures.

The aim of the study is to present the experience of the various methods of identification by comparative analysis.

1. The basis of identification and authentication

In connection with the technical innovations of the 21st century the demand for electronic administration became high both in the private and the public sector.

Electronic administration is the management of the official administrative cases by the way of electronic means. Electronic administration means also the complexity of the working sections of the management from the view of formality and from the view of content as well. [2]

According to the eEurope 2002 action plan [13] to measure the expansion of electronic public services a set of 20 most frequently used electronical service and their development level (on a 1-4 scale) was defined.

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The levels of e-service development:

- 1st level: online information sharing
- 2nd level: one-way connection (downloadable electronic forms for the administration processes)
- 3rd level: interactivity (online filling of forms, or the forms are downloadable and after filling uploadable)
- 4th level: comprehensive (transaction included) service (the whole administrative process is digitalised including payment)
- 5th level (since 2007): personalisation (automatized, proactive, client oriented, customised services). [7]

Because rights and obligations are connected to the administrative process, from the 3rd level of the electronic administration, the users' (clients and administrators) identification is required. Till a certain degree, the users are obliged to identify themselves and the documents used during the administrative process with credibility.

Authentication and identification are closely related terms therefore their interpretation is diverse in the professional literature.

„Identification" of a person: the process of obtaining information about whom the requester claims to be without considering the "trustability" of this information. [8]

„Authentication" (of a person): the provision of assurance of the claimed identity of a person. [8]

„Electronic identification" means the process of using person identification data in electronic form uniquely representing either a natural or legal person, or a natural person representing a legal person. [10]

„Authentication" means an electronic process that enables the electronic identification of a natural or legal person, or the origin and integrity of data in electronic form to be confirmed. [10]

In the traditional administrative process, the circumstances of visual identification and authentication are guaranteed. The content of a written claim is appropriate for identification and authentication of a signature. In case of personal appearance an official card is used for identification purposes. During electronic administration, different kinds of electronic identification and authentication methods and their combinations can be applied.

- Knowledge based: user name and password (or PIN code)
- Tool-based: some type of identification tool is needed (ex: key, card, tokens)
- Characteristic based: the recognition of the users' personal characteristic (ex: fingerprint, retinal images, facial features)

One secure way of identification is the two-step verification system. It could be for example the combined use of a card and a PIN code; or after typing the user name and password to authenticate the user has to enter a unique code which is sent via SMS or email.

In the electronic administration processes identification requires the scrutiny of the received information.

Identification is a service as a result of which the authority that requests the identification, for the purpose of its tasks with the level of adequate safety, becomes sure that the subject of the identification is the same person with the client requesting for identification. The result of the identification is the notification on or confirmation of the information which ensures adequate level of safety and which is appropriate for the unambiguous identification of the person requesting for his or her identification. [3]

2. Changes in the legal environment

Electronic administration and identification significantly progressed over the past 15 years. The following section provides a brief overview of the major milestones.

2001 Electronic signature based model

In early 2000, the first phase of the e-government realization the main goal was the establishment of a unified government network (called Electronic Government Backbone Network) and the development of a governmental portal (www.ekormanyzat.hu). In the initial period the governmental website was mainly used for distributing information and offer downloadable forms. Starting administrative processes were only possible after registration and just in a limited spectrum for the clients.

The legal frames of authentic electronic signature were created by the Act XXXV. of 2001 on electronic signature implementing 1999/93 EC directive.

For the purposes of the law *"electronic signature" means data in electronic form which are attached to or logically associated with other electronic data and which serve as a method of authentication.* [9]

The "Advanced electronic signature" means an electronic signature which meets the following requirements:

(a) it is uniquely linked to the signatory;

(b) it is capable of identifying the signatory;

(c) it is created using means that the signatory can maintain under his sole control; and

(d) it is linked to the data to which it relates in such a manner that any subsequent change of the data is detectable. [9]

Alongside document authentication electronic signature could be used for personal authentication as well, but this form of its' use is not widespread.

2005 Establishing the legal basis of e-government services

From the mid-2000s establishing the legal environment for e-public services and centralising the IT background became vital. The purpose of the newly formed Central Electronic Services Network was to create the operating framework for electronic administration.

Parts of the Central Electronic Services Network:

- Electronic Governmental Network
- Government Website (www.magyarorszag.hu)
- Identification service (Client gate and Office gate)[3]
- Central customer service
- Services (for example Safe electronic document transmission service) and availability of electronic administration

The Act CXL. of 2004 on the General Rules of Administrative Proceedings and Service made positive changes by supporting the electronic administration. The law preferred the usage of the electronic signature (sending electronically signed documents), but in the daily practice the Client Gate authentication had a greater role.

2009 The legal regulation of electronic public services

In 2009 a new model has been introduced for the electronic public services by the Act LX of 2009 on electronic public service. Electronic public service is a service, which is available without restriction, provided by the administrative authorities and the other providers through the Central System by way of electronic means.

As a general rule, all public administration organizations have to communicate and provide their electronic public services through the Central System. In the Central System, the main form of client identification is the Client Gate.

2012 The introduction of the Regulated Electronic Administration Services (short name: SZEÜSZ[4])

With the beginning of 2012 the electronic public administration became renewed. The previously claim (document between clients and authorities) based administrative processes has been replaced by the Regulated Electronic Administration Services. The new model is more flexible and client oriented, it is targeted to enforce the clients' rights and needs.

The amendment of the Act CXL of 2004 (especially its Chapter X on Electronic administration) established the legal preconditions for eGovernment services. The so called regulated electronic

[3] The Client Gate is a free electronic authentication service. The citizens (Client Gate ID) and public administration organizations (Office Gate ID) use username/password authentication.
[4] Alias: Regulated Electronic eGovernment Services (REeS)

administration services were introduced. Further rules can be found in the following government regulations:

- 83/2012. (IV.21.) Government decree on regulated electronic administration services and the services compulsorily provided by the State.

- 84/2012. (IV.21.) Government decree on assignment of certain organisations related to electronic administration.

- 85/2012. (IV.21.) Government decree on the detailed provisions regarding electronic administration.

The services include authentication service. Based on the model the used authentication method is subjected the users' administration regulation.

2016 Electronic administration as a natural choice

The Regulated Electronic Administration Services have been formed by the end of 2015 and it led to the adoption of a specific overall electronic administration law. This new (Act CCXXII of 2015) law will gradually enter into force until 2017 and replace the existing legal texts.

For the clients, especially important the right (not obligation) to electronic public administration. From 2018 for the businesses, clients' legal representatives and authorities in client position are obliged to use electronic public administration processes (if the electronic administration is applicable).

The main parts of the electronic administration law:

Part 1: Introduction (interpretation of definitions)

Part 2: General rules for the relationship between the client and the public administration body (among others the regulated electronic administration services)

Part 3: The IT collaboration of the electronic administration and other bodies (interoperability rules)

Part 4: Trust services (based on the eIDAS regulation)

As of 1 July 2016, the Act CCXXII of 2015 law repeals - among others - Act XXXV of 2011 on Electronic Signature, so the rules of electronic signature shall be found in the eIDAS Regulation and the part of Trust services from that date. The 83/2012. (IV. 21.) Government decree was replaced by the 451/2016. (XII. 19.) Government decree on the detailed rules of electronic administration.

3. Identification in the Regulated Electronic Administrative Service model

The Regulated Electronic Administrative Services, as building blocks of administration are designed to be able to make contact and share data with each other if it is necessary, more over they are compatible with the authorities' information systems and work securely.

Regulated Electronic Administrative Services (called “SZEÜSZ”) are the following:

- electronic authentication service
- secure delivery service
- any service which can be used to offer electronic administration solutions and are in harmony with the requirements stated in the law on electronic signature
- other electronic services regulated in the 451/2016 (XII. 19.) Government decree [1]

The following services are provided by the Government:

- electronic identification for natural persons
- secure delivery service
- governmental authentication service
- other electronic services regulated in the 451/2016 (XII. 19.) Government decree

The below listed Central Administration Services (named “KEÜSZ”) are provided by the Government through specific service providers appointed by law:

- catalogue on client’s instructions on administrative services (short form Instruction Catalogue)
- record of document validity
- electronic payment and accounting system
- identification based document authentication
- central arrivals agent
- central delivery agent
- periodical client notification on electronic administrative acts
- conversion of paper based document to an authentic electronic document
- conversion of electronic document to an authentic paper document
- central authentication agent
- personalized administration interface
- form submission supporting service

- central document authentication agent (new service)
- electronic form for general purposes (e-Paper, new service)
- linking register

Identification service has a principal role; this function appears in various levels. Electronic identification can be:

- Regulated Electronic Administrative Service (called “SZEÜSZ”)
- identification by an electronic tool described in the eIDAS Regulation
- other forms of identification regulated by the electronic administration service provider

Identification services defined by the law are:

- electronic identification service by electronic identity card containing a storage unit (chip)
- Client Gate
- Partial Code Telephone Authentication

Every client who obtain electronic signature can register for electronic identification service by using other type of electronic service or by personally at the authorities. The Central Client Registration Index (abbreviated as “KÜNY”) help in the clients’ authentic identification. The clients are able to determine which way (electronic, postal or both) they want to keep contact with the authorities and what type of identification methods they prefer, these instructions are stored in the Instruction Catalogue.

In 2016, a new central identification solution, the Central Authentication Agent (CAA) has been launched. This solution supports the use of different electronic identification and authentication services, including the already existing Client Gate and the newly introduced national eID card, as well as the Partial Code Telephone Authentication. Every client (registered in the “KÜNY”) and e-administration service provider can access to governmentally approved identification services through the Central Authentication Agent. The CAA service provides a unified interface for the different identification services including the services provided by the Government. Nowadays clients can choose between the Client Gate or the Partial Code Telephone Authentication, introducing the eID to the system is under development.

3.1 New Personal Identity Card (eID card)

The main functions of eID card:

- ePASS: electronic travel document function
- eID: electronic identification function
- eSign: electronic signature function.

The chip also stores the citizens' Tax ID Number and National Health Fund ID Number electronically. The eID function of the card is secured with a 6-digit PIN, and the optional eSIGN function with a 7-digit PIN.

The Governmental Certification Service Provider (Certification Authority), offering both qualified and non-qualified (advanced) electronic signature and time stamping services to government organizations and institutes. [17]

Since 2001 only a moderate increase was visible in the usage of the electronic signature, surprisingly this trend changed in 2016, when the number of users shoot up. However detailed information on the usage of electronic signatures is not available, both the number of certifications and documents shows increase.

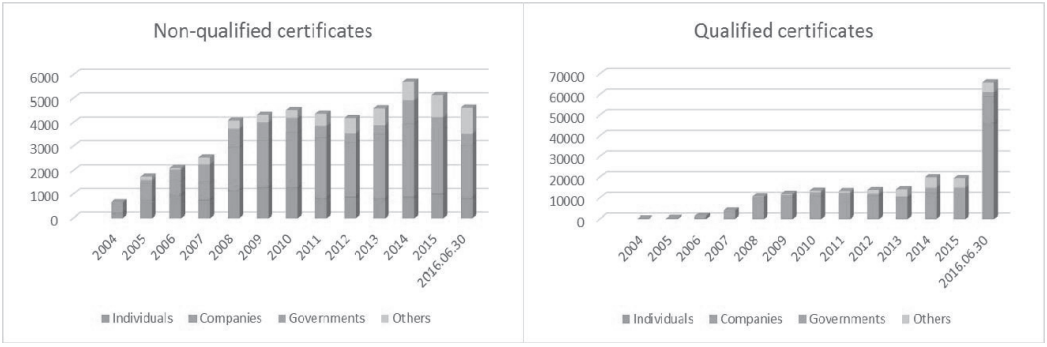

Figure 1: Number of certification in Hungary
Source: [18] (own edit)

In the 1st half of 2016 the number of qualified certifications was the triple than the previous year's. This increase is noteworthy in the case of private persons (In 2015 the data is 62, but in 2016 it is 46003). [18]

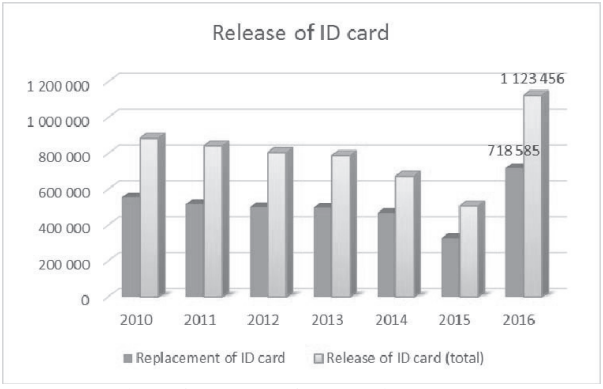

Figure 2: Release of ID card in Hungary
Source: [6] (own edit)

The trends on issuing certificates also represents the new eID card's popularity. [6] During January 2016, in the first month after its introduction, 133 000 new eID cards have been issued by the Hungarian authorities, out of which 51 000 includes the biometrics necessary for the optional

ePASS functionality and 19 000 including the digital certificate needed for the eSIGN function. [12] During the 1st ten months, more than 60 thousand persons (about 6%) required e-signature. [14]

3.2 Client Gate

Client Gate is the official electronic identification and authentication system of the Hungarian government since 2005. It enables the users to interact with electronic public administration providers with a single entry. Any natural person (irrespective of nationality) over 14, has right to apply for a Client Gate account. Those under the legal age has only access to a restricted circle of services (ex. process of application for higher education). Client Gate account can be created personally (ex. at the government windows) or electronically with the new eID. [5]

The person applying for new Client Gate account has to identify himself (with an ID card, passport or driving licence) and provide some personal data, such as identification data, nationality, email address. A client can have more than one Client Gate accounts, the 1st is free of charge. [15]

Identification used by Client Gate is a pair of username and password (knowledge based identification). where the password is valid for 2 years. A storage service is connected to every user account, it can be used to download, upload or store official forms and document. This storage service will be linked to the other identification and authentication services in the future. If no other identification method is connected to the Client Gate, its identification process is weak.

By the end on 2016, 2,5 million registered clients had Client Gate, yet the number of active users is possibly lower. For example, the application to higher education needs client gate authentication, so many young people sign up, but later they do not use the service.

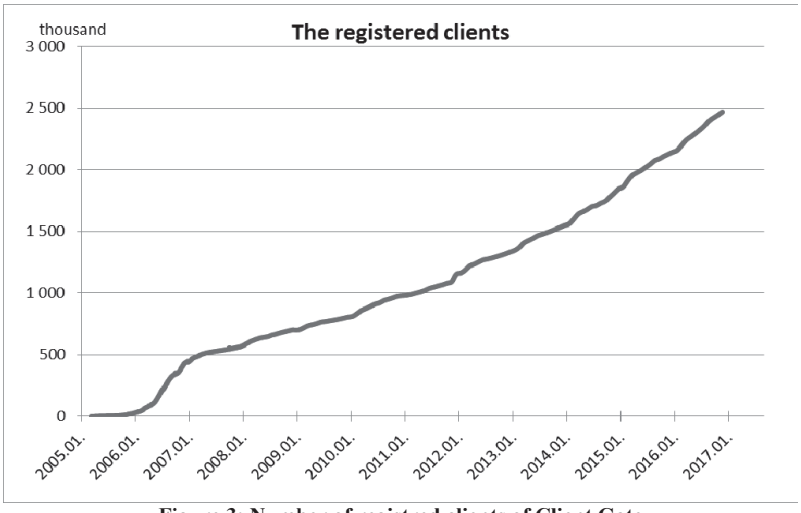

Figure 3: Number of registred clients of Client Gate
Source: [16], own edit

The most used services by Client Gate:

1. Tax and custom services
2. Communication web host
3. Register of the Land Office
4. Register of the social security services
5. Tax declaration

3.3 Partial Code Telephone Authentication (PCTA)

The Partial Code Telephone Authentication is a newly introduced identification method which let clients to solve certain public administration cases on telephone by using Governmental Client Line (clients have to call 1818). Besides telephone identification the service makes identification available through the Internet, it quickly became the alternative solution of the Client Gate. This service targets those citizens who prefer modern solutions to handle public administration cases, but has no or limited IT background.

The system generates an 8-digit long numeric user ID and a 6-digit long numeric password for the registered clients. During the telephone identification process 3 randomly selected digit has to be given from the password by the client, but in the online identification the person has to enter the whole password. However, this service it not yet in the mainstream, only few people know and use it, in the future its number of users expected to grow significantly.

4. Summary

Electronic identification services in the public administration developed continuously during the past years. The topic is exceptionally versatile it consists the clarification of the terms identification and authentication, examine the regulatory environment, technical issues and practical implementation. The Hungarian national legal frame complies with the EU directives; it is in accordance with eIDAS regulation. Thanks to the new e-administration service model, authentication services have been created. At the present time, the Central Authentication Agent is not yet complete, we have to wait until the new eID authentication will be incorporated.

The three main forms of personal identification are currently operating side by side; the client can choose the most preferred option. The subsequent table summarizes the main characteristics of these identification forms.

	eID	Client Gate	Partial Code Telephone Authentication
Introduction	2016	2005	2015
Applicant	Hungarian citizen, immigrant or permanent resident, refugee or protected person	Hungarian and foreign country's citizen	Hungarian citizen, immigrant or permanent resident, refugee or protected person
Way of application	personally	personal or online	personal or online
Number of registrations	1	more	1
Number of applicants	more than 1 million	nearly 2,5 million	approximately 2000
Expenses	free of charge	1st registration is free	free of charge
Needed assets	IT tools + card reader	IT tools	telephone
Identification and authentication	two-stage (card + PIN code)	in the practice: one-stage knowledge based (username + password) possibility of two-stage authentication	in the practice: one-stage knowledge based (username + password) possibility of two-stage authentication
Connection	Internet	Internet	Telephone + Internet
Number of issue types	unknown	>130	2 (telephone) >130 (online)
Advantages	high security	easy usage well-known	easy usage no need for IT skills and tools
Disadvantages	card reader is required (app. 13 000 HUF) it can be usable now just in few places and for few cases	username and password can be easily cracked	less-known among clients
Development opportunities	support the dissemination of the card readers, promotion of solvable issues	increase security, application of 2-stage authentication	popularization application of 2-stage authentication

Table 1: Comparison of the authentication services identified by the law on e-administration

In 2016 numerous positive changes started and this trend will continue through 2017. Although for the citizens' electronic administration continue to be an alternate option for public administration services; for the businesses, organisations, legal representatives of the clients the electronic administration is obligatory in more and more cases. For administration, reliable identification and the uploaded documents' authenticity is essential. Therefore, the new eID card will have a significant part in the administration process, balancing the other authentication forms.

5. References

[1] Act CCXXII of 2015, Act CCXXII of 2015 on the General rules for electronic administration, 2017.

[2] Act CXL of 2004. Act CXL of 2004 on the General Rules of Administrative Proceedings and Services, 2016.

[3] Act LX of 2009. Act LX of 2009 on electronic public services (Not in force since 01/04/2012), 2009..

[4] Act XXXV of 2001, Act XXXV of 2001 on Electronic Signiture (Not in force since 01/07/2016), 2016.

[5] BM NYHÁT (KEK KH): Ügyfélkapu regisztráció, 2016. Retrieved 01 05, 2017, from Belügyminisztérium Nyilvántartások Vezetéséért Felelős Helyettes Államtitkárság: http://kekkh.gov.hu/hu/ugyfelkapu_regisztracio

[6] BM NYHÁT (KEK KH): Statisztikák – Okmánykiadás, 2017. Retrieved 01 15, 2017, from Belügyminisztérium Nyilvántartások Vezetéséért Felelős Helyettes Államtitkárság webpage: http://kekkh.gov.hu/hu/statisztikak

[7] CAPGEMINI, Ernst & Young, The user challenge Benchmarking the supply of online public services. 7th Measurement. September 2007. Brussels: European Commission, DG for Information and Media, 2007.

[8] CEN WORKSHOP, Architecture for a European interoperable eID system within a smart card infrastructure,. *CEN Workshop Agreement*. Brussels: CEN, 2005. Retrieved 11 26, 2016, from ftp://ftp.cenorm.be/PUBLIC/CWAs/e-Europe/eAuth/cwa15264-01-2005-Apr.pdf

[9] Directive 1999/93/EC, Directive 1999/93/EC of the European Parliament and of the Council of 13 December 1999 on a Community framework for electronic signatures . Official Journal, 1999.

[10] Directive 910/2014/EU, Regulation (EU) No 910/2014 of the European Parliament and of the Council of 23 July 2014 on electronic identification and trust services for electronic transactions in the internal market and repealing Directive 1999/93/EC. Official Journal of the European Union, 2014.

[11] EGOVERNMENT WORKING GROUP). eGovernment indicators for benchmarking eEurope. European Comission, 2001, February 22. Retrieved 12 04, 2016, from http://ec.europa.eu/newsroom/dae/document.cfm?doc_id=1189

[12] EUROPEAN COMISSION eGovernment in Hungary, February 2016, Edition 18.0. Brussels: JSA, 2016. Retrieved 01 10, 2017, from https://joinup.ec.europa.eu/sites/default/files/ckeditor_files/files/eGovernment%20in%20Hungary%20-%20February%202016%20-%2018_00%20-%20v3_00.pdf

[13] EUROPEAN COMMISSION: eEurope 2002 - An Information society for all. *Action Plan prepared by the European Commission for the European Council in Feira 19-20 June 2000, COM/2000/0330 final*. Brussels.

[14] IGNÁCZ, I.: eSzemélyi - kulcs az e-ügyintézéshez. Balatonfüred: Infotér Konferencia, 2016. Retrieved: 01 12, 2017, from https://www.youtube.com/embed/4Vnwd02qXBA

[15] Magyarorszag.hu: Segítség: Ügyfélkapuról általában, 2017. Retrieved 01 10, 2017, from Kormányzati Portál: https://segitseg.magyarorszag.hu/segitseg/ugyfelkapu/ugyfelkapu/kihasznalhatjaazugyfelkaput.html

[16] Magyarorszag.hu: Statisztika, 2017. Retrieved 01 20, 2017, from Kormányzati Portál: https://ugyintezes.magyarorszag.hu/dokumentumok/mohustat.xls

[17] NISZ Zrt, 2013. Retrieved 01 10, 2017, from Government CA: http://hiteles.gov.hu/

[18] NMHH (National Media and Infocommunications Authory): Elektronikus aláírással kapcsolatos szolgáltatási statisztikák (2004-2016), 2016. Retrieved 01 03, 2017, from NMHH webpage: http://nmhh.hu/dokumentum/172147/e_alairassal_kapcsolatos_szolgaltatasi_statisztikak.pdf

eGovernment III

CHALLENGES FOR IMPLEMENTING OPEN EDUCATIONAL RESOURCES BY TEACHERS IN HIGHER EDUCATION

Roza Dumbraveanu[1]

Abstract
Higher Education Institutions (HEI) are facing a number of problems during the last decades: the need to update the curricula to make it compatible with the similar ones from other national and European universities; demand to update the content and the pedagogical approach due to knowledge, technological and research development. Open Educational Resources (OER) might be a sound strategy for institutions to meet these challenges. At the same time OER are themselves one of the challenges that the teachers are faced with. OER could be implemented in courses in different ways, depending on the types of OER and the educational philosophy adopted by the teachers. The paper describes some challenges for implementing Open Educational Resources by teachers in Higher Education in Moldova: the level of awareness on availability and usage of OER; fair use matters; quality assurance of resources; pedagogical approaches for implementing OER into teaching and learning. The paper also grasps the issues of the digital divide that emerge when investigating these challenges. The judgment is based on the literature analysis and on the author's teaching experience within courses for initial and continuous professional teachers' training.

1. Introduction

Among the major challenges and commitments made by Higher Education Institutions in the context of the Bologna process is the cooperation in quality assurance of the comparable study programmes and degrees. These main pillars of Bologna action lines are supposed to assure the development of the advanced knowledge, skills and competences of HEI graduates that should fulfil the increasingly labour markets demands. The Higher Education priorities for the current decade (2010 – 2020) [3] – social dimension, equitable access and completion, lifelong learning, employability, student-centred learning and the teaching mission of higher education – impose more challenges for Higher Education Institutions in terms of quality and comparability.

The subject of this paper consists in an endeavour to describe some connections between the necessary conditions for accomplishment of Bologna requirements, the digital divide and the usage of Open Educational Resources in Higher Education Institutions involved in teacher training from an Eastern Europe country – Moldova – in terms of implementation challenges. The digital divide related to this issue needs the analysis of several variables: university teachers and decision makers; their characteristics – digital skills, motivation and reason to use OER; level of OER usage.

2. Bologna reform and needs for OER

Moldova joined the Bologna process in 2005 and the preparation phase was very short, albeit the reform means a complicated process of change. The degree structure and the curriculum were

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redeveloped in a few months prior to the academic year 2005/2006. The commitment to adopt easily readable and comparable degrees and to establish three cycles required essential efforts from Higher Education Institutions to modify the study programmes. The changes affected the structure and the content of the programmes, the courses, as well as the teaching & learning & assessment approach as the renewed curricula must meet the criteria of compatibility within European Higher Education Area (EHEA).

After almost a decade the HEI are still faced with a series of challenges, according to the National Report of Moldova on Bologna Process [12]. It turned out that some already implemented action lines are likely to require revision and updating. Even though the three cycles are in place, the main problems are compatibility of the degrees, the quality and the employability of the graduates.

The compatibility issue implies a complex analysis of policy documents released at European level, study and understanding of key milestones of the curricula reform; finding the solution for the implementation of the Bologna recommendations in the national context, identification and analysis of European surveys, projects' reports, research works that describe the experiences, the best practices or eventual problems and failings in the Higher Education Institutions' endeavours to build the European Higher Education Area. Apart from these generic documents, specific information about curricula and courses delivered by different European Higher Education Institutions is vital for the academic staff, who usually deals with study courses for the degree profiles. This specific information is related to points of reference, convergence and common understanding in assuring the quality and compatibility of study programmes; pedagogical approaches implemented in developing graduates' competences for employability; educational resources used. The primary and almost the only sources of such kind of information for the academic staff from Moldova HEI are found through web services.

The challenge is that many teachers assume that they are freely allowed to use materials made public available on the Internet in their courses and at their institution. They do not pay attention to the fair use rules and Moldovan institutions do not publish guidelines on this topic. Teachers might not always have the right to download, save, print or email files from the Internet to students or colleagues. The international, including European, copyright license schemes and free use exceptions regarding educational uses by teachers are complicated. Academics should spend valuable time trying to understand complex copyright rules and seeking permission to use web educational resources. The only Internet resources that can be used by teachers and students with no fear for copyright infringement are Open Educational Resources that are licensed under Creative Commons (CC) [5].

Open Educational Resources are defined as "technology-enabled, open provision of educational resources for consultation, use and adaptation by a community of users for non-commercial purposes". Open Educational Resources include learning objects such as lecture material, references and readings, simulations, experiments and demonstrations, as well as syllabi, curricula and teachers' guides [22].

With this definition, the answer to the question „Who can benefits from OER?" becomes evident: teachers, course developers, institutional policy makers and students. The benefits involve several dimensions [14].

- *Safety*. It is much safer for teachers to use Open Education Resources, as they are free to reuse, remix, redistribute and adapt education resources, avoiding the risk of infringing the complex copyright exceptions and copyright license rules.

- *Accessibility*. There are hundreds of millions openly CC-licensed works and many searchable online databases of CC licensed materials available.

- *Compatibility*. The freedom which the Internet provides to copy, distribute, adapt and remix resources, the openness and the existence of many sources for the same content allow academics to choose, to compare and to select quality materials, peer reviewed already by other experts.

- *Improvement*. It saves teachers' time and energy by using resources that have already been created and tailoring them to the specific content of the own courses.

- *Enrichment*. It expands teachers' opportunities for interdisciplinary teaching and learning by allowing them to integrate multiple educational resources, including multimedia and project based education.

- *Enlargement*. It allows teachers to go beyond the limited use of available textbooks and own materials.

- *Collaboration*. Academics are encouraged to collaborate and to create communities based on sharing of education resources which can increase the quality of materials and the development of ideas.

- *Equitability*. Everyone has equal access to knowledge and to education resources that can be adapted for the own needs.

- *Costs*. It helps to solve the problem of low financial funds allocated for educational resources that the State financed institutions from Moldova are faced with.

Another question is „Are academics ready to use OER?" The answer is more complex and it tackles different aspects of the digital divide.

3. Digital divide in educational context

The term digital divide is rarely explicitly discussed in the academic context of Moldova Universities, though implicitly it is used mostly to describe the users' access to Internet. However, the concept is more complex and the manifestations of its intricacy emerge immediately when someone is trying to analyse the usage of digital resources by the academics, as they are entitled to promote the correct and meaningful intellectual property rules of cyberspace and not only. A comprehensive review of ideas on digital divide in Higher Education, from simple physical access to infrastructures to the more complex and philosophical challenges of digital empowerment is provided in the monograph *Redefining the digital divide in Higher Education*. The authors [15] proposed a useful tool for the investigation of the state of digital divide: the comprehensive digital framework with five main pillars. This tool was adapted and simplified for educational purposes in [16]; graphically it looks like in the figure 1. The initial five pillars have been reduced to three,

leaving aside the ICT sector and the legal framework as they belong to higher levels of policy-making, outside the education institutions' usual decision-making areas.

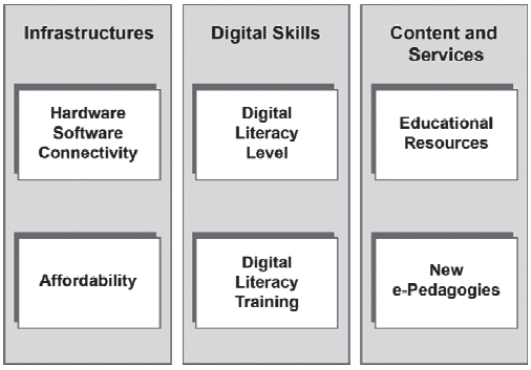

Figure 1: A digital framework to model e-education [16].

The three pillars – infrastructure, digital skills, content & services – involve six key issues:

1) (a) Infrastructure and access: hardware & software & connectivity and (b) affordability: provision of (a);

2) (c) Digital literacy level and (d) digital literacy training;

3) (e) Educational resources and (f) new e-pedagogies.

All these components are interwoven; the analysis of ICT usage/benefits on education should consider each of them.

In this paper, the status of the first pillar is omitted for 3 reasons: a) it belongs to the economic divide, which implies that institutions or individuals cannot afford to buy the needed technologies, but the problem cannot be solved by academics; b) the universities in Moldova have the minimum technical infrastructure for using Internet technologies in education; c) the paper aim is to fix other aspects of the digital divide.

Teachers' digital literacy (pillar 2) is far more important in education and the term covers a large set of skills starting from basic generic ones till advanced digital competences. The digital literacy picture reveals a distribution of teachers with different levels of skills: informatics disciplines and technological enthusiastic teachers at the competence edge and the majority at the very basic skills level. This majority can use computers, but don't achieve the modern world's full benefits because most of the available technologies are too difficult for their digital level to apply in the academic context. This aspect of skills differentiation is called usability divide.

The third pillar comprises educational resources – textbooks, tutorials, syllabuses, learning objects, assessment tasks and other educational aids, starting from digitalized versions of handbooks and ending with interactive simulations and collaboratively generated content on virtual platforms. E-pedagogy is a new concept and stands for enhanced ICT pedagogy covering also a large spectrum of changes: from implementation of some ICT tools and resources up to redefinition of teaching & learning & assessment approaches. It causes the most hard and less considered type of divide –

empowerment divide. The boundaries between usability and empowerment divide overlap in a greater or lesser extent.

In this paper, the digital divide is tackled in combination with the divide related to the implementation of Open Educational Resources (OER divide) in HEI offering initial teacher training. The digital technologies, in the form of open content, open licenses, open formats, and open software and their use in different e-learning approaches provide the opportunities for enhancing the quality of education. The use of digital technologies has opened up possibilities for open learning by increasing the scope for much more non face-to-face, two-way interaction and collaboration between groups of learners and their teachers. At the same time this mode of teaching and learning is extremely variable, with socially excluded groups being those who do not have much access to such technologies, who may find few opportunities available to them in their contexts, and who cannot cope with these new technologies and ways of learning [10]. In other words, the digital divide causes open education divide.

4. Digital divide and OER usage

The more challenging aspect of the digital divide consists in the use of OER by teaching staff for curriculum design and implementation. Compatibility of the study programmes and of the courses requires the conceptualization of the learning outcomes as a measure unit for easily readable and comparable degrees across Europe. In redesigning the curricula, the focus must rely on student centred approach and on flexible learning environment that includes rich teaching and learning resources, suitable for the individual academic pathways of the students. There is a strong need to learn from best experiences: the subject developers at national level should collect good examples at European level and make them available for the teaching staff. These reasons and the mentioned OER benefits impose the academics to adopt and to implement this kind of resources in their professional practice.

While the use of open educational resources has the potential to mediate the compatibility issues and to improve the quality of education, the existing opportunities might not be capitalized due to the digital divide. The availability, affordability and accessibility of OER do not certainly imply the acceptability and usability of this mode of teaching and learning. The variables that appear in this equation are the digital skills of teachers as well as their motivation.

Applied to teachers, “digital literacy is the awareness, attitude and ability to appropriately use digital tools and facilities to identify, access, manage, integrate, evaluate, analyse and synthesise digital resources, construct new knowledge, create media expressions, and communicate with others (students and colleagues) in the context of specific life situations, in order to enable constructive social action (learning), and to reflect upon this process” [11]. The digital divide emerges due to several reasons: resources allocated by teachers to afford the technology, motivation (interest and confidence) and the offered opportunities (social, cultural, educational).

Resources allocated refer to time and efforts teachers devoted to cope with the new technologies and the ways of teaching and learning with or without direct support from intermediaries. The digital educational divide can mean that some teachers are more advanced users of digital technology which is implemented in their teaching activities than their colleagues, and the gap can increase as technology becomes more sophisticated. The teachers’ capabilities, their inputs as learners, and the formal interventions to support the professional teachers’ development are different in different contexts and the time needed by staff to learn and understand how to navigate

on net, to use the options the technologies offer, and to implement these technologies in classrooms must not be underestimated. The feeling that they cannot afford the achievement of the certain level of digital literacy can cause the lack of confidence in their competence to succeed to use the technology in general or for education in particular.

Motivation is determined preponderantly by the challenges the teachers face. Through interviews and conversations in different formal, informal and non-formal contexts with academics from Moldovan teacher training universities, it was revealed that they face a series of challenges:

- limited access and use of curricular components from other countries;
- lack of high quality, adequate teaching and learning resources, including textbooks;
- difficulties in implementing the learner-centred approach;
- the need to update the courses' content as consequence of the rapidly growing knowledge base;
- the students' demand for diverse high quality resources;
- difficulties to find appropriate web resources;
- the need to develop and to update the digital competences;
- the need to develop comprehensive learning tasks for diverse students' needs and levels.

Implementation of OER may be a sound strategy for HE institutions to meet the mentioned challenges. As it was stated in the OECD report *Giving Knowledge for Free* [9], OER can be expected to affect curricula, pedagogy and assessment. The main challenge for the staff is the awareness of Open Educational Recourses and Open Educational Practices, as these resources provide a rich pool of different types of teaching and learning materials, starting from single objects, like course descriptions in terms of developed competences and declared learning outcomes and ending with complete courses, delivered as Massive Open Online Courses (MOOC). With thousands of open courses from internationally reputed higher education institutions available for free, and with the trend towards sharing learning resources, teachers will need to consider that students compare their curriculum with others and will be enforced to review and update their courses.

OER could be implemented in courses in different ways depending on the types of OER, educational philosophy and pedagogical approaches adopted by the teachers. As the knowledge base is changed quickly, national educational authorities (both governmental and institutional) are not able to develop quality resources such as textbooks, tutorials, reviews, complete electronic courses due to human and financial shortage. Open textbooks and tutorials published electronically are good assets to be incorporated as sources of knowledge for students and for teachers as well. Nowadays, when thousands of books and textbooks in physics, mathematics, chemistry, biology, programming, management, psychology etc. can be accessed online, it is easier than ever to synthetize the course topics and to design learning tasks for the individual student workload. At the same time, the large choice of study materials available can cause problems in choosing a textbook

or a tutorial: what is the best; what suits the learners' needs and abilities; how to compare different resources in terms of content explanation, novelty, adequacy to learning outcomes; how to combine different styles of presenting the ideas, laws, concepts etc.

The challenge in this case has two heads and a twofold meaning: on the one hand, the rich opportunity to implement or to adapt the existing OER in an adequate pedagogical manner in the own settings and learning environment, on the other hand, the difficult task to find and to select the appropriate resources. The good solution of these challenges could contribute to the quality of the courses and could leads to the better achievements of the comparability of the study programmes.

The frequent encountered barriers in the correct usage of OER are [6]:

- low awareness about the search facilities to find suitable resources for the teaching & learning activities on the web;
- confusions about the classification of digital resources;
- unaided awareness of the pedagogical approach, envisaged by OER to be implemented in accordance with the requirements of the learning environment;
- insufficient degree of critical assessment of the web resources;
- diffuse understanding of the terms 'open', 'free', 'no cost', as well as of the types of licenses, applicable to the educational content and software;
- doubts about the acceptance by stakeholders of OER implementation into curricula and of adequacy of OER to curricula;
- inadequate level of digital competences of the staff to develop their own OER;
- lack of OER in mother tongue; insufficient teachers' level of foreign language skills.

5. Initiatives on promoting OER

The level of awareness on availability and usage of OER is quite different among teachers from the Moldova's educational institutions. The national policy related to the implementation of ICT into education outlined in *the Education-2020 Strategy* document [11] includes a specific objective on the development of digital competences through the elaboration and implementation of digital educational content in the study process.

The European policies emerged from the Bologna process, *the Europe 2020 Strategy* [8] and the *Strategic Framework for European Cooperation in Education and Training* [21], also focused on the relevance of sustained Higher Education space where the development of competences are aligned with the labour market interests and needs. In its Communication, *Rethinking Education* [17], the European Commission calls for a fundamental shift in education, with more focus on learning outcomes – the knowledge, skills and competences that students acquire. Particularly, the strategy highlights the „...needs to be a much stronger focus on developing *transversal skills and basic skills* at all levels"..."*Technology*, in particular the Internet, must be fully exploited. Schools,

universities and vocational and training institutions must increase access to education via open educational resources. These reforms must be supported by well-trained, motivated and entrepreneurial *teachers*".

As consequences from these policy documents, there should be appropriate social and cultural support for the prospective teachers to help to reduce the disempowering conditions to the inequalities in the educational and the digital divide. As was mentioned in [10] the open movements have mostly not been state interventions but have arisen through the acts of institutions themselves and wider communities sponsored by philanthropic foundations, although some governments begins to take note of these movements. This is not the case of Moldova which policy documents and the stakeholders at the university level do not envisage activities which aim to promote OER in education. Under these circumstances the task of promoting the OER in Moldova relies on the bottom-up initiatives of enthusiastic individuals. The start-up impulse on promoting OER among academic community, including institution stakeholders, with the aim to mitigate the digital divide, could rely on several actions:

- Providing links to the most relevant OER information (international policy documents, guides, projects, portals etc.) on the institutions' websites.
- Elaboration of an OER guide for teachers and stakeholders in the national language.
- Organisation of trainings on OER benefits.

One of the bottom-up initiatives of an academic team from two universities from Moldova (State Pedagogical University "Ion Creangă") and Romania (West University of Timisoara) was to propose and to implement a two years project "Teachers' continuous professional training through development of Massive Open Online Courses (MOOCs)" within a bilateral cooperation programme [18].

The project sets out to improve the training of teachers from the participating countries by carrying out a MOOC course which integrates open access educational resources. The main objectives of the project refer to the identification of possible solutions to the mentioned problems; to facilitate access of teachers, who aim to improve their teaching and to update their digital competencies, to provide continuous professional training; to promote examples of good practices and to make pedagogical design recommendations in the valorisation of MOOC resources offered within professional and continuous training. Supporting the teachers to adopt the open educational resources in their courses will create real incentive to mitigate the digital divide on the awareness of a huge open knowledge basis available nowadays on the world wide repositories.

6. Challenges in training OER newcomers

The teachers must be provided with opportunities for continuous professional development linked with the effective use of OER materials in their classroom. The awareness is the first step in the ascendance to the genuine infusion of quality OER into curricula. The next one is related to finding and selecting the appropriate open resources. This issue does not differ substantially from finding and selection of any digital resource, technically the only difference being the substance of searching, the hints for searching and the hubs where to perform the search. At the same time the searching process is very close to the awareness issue, as the teachers should distinguish what they

are looking for, what types of open resources are available and where there is information concentrated already.

According to a series of studies on academic adoption and usage of OER [2,13], the most recent one being about the educational resources in U.S. "both faculty and academic leaders believe that one of the most serious issues facing wider adoption of open educational resources is the effort needed to find and evaluate suitable material". The three most-cited barriers to adopting OER relate to the availability and difficulty in finding suitable resources "there are not enough resources for my subject", it is "too hard to find what I need" and "there is no comprehensive catalogue of resources" [2]. The same opinions have our faculty teachers; their willing is to have access to specialized catalogues with teaching and learning resources classified by disciplines.

Unfortunately, there is no single comprehensive listing of all OER, and given the rapid expansion of online content, is there ever likely to be one. With the advance of OER movement, the searcher will need to employ a number of search strategies to find appropriate OER: use specialised search engines; locate OER repositories; use OER directory sites; find OER projects' sites [4]. Other challenge is that most of these OER sources exist independently of each other. As a result, the searchers must locate possible repositories and spend hours to compare the materials in each separate repository – a time consuming process in which many teachers may not have the will and the time to engage.

The selection of OER to be included in the courses is connected with the quality and the usability of open teaching and learning materials. Quality is a complex concept, and the issues related to OER have multiple facets. The concern of the academic community for the OER quality is proved by numerous articles, reviews and guidelines [19]. Two aspects should be considered in training the OER newcomers: 1) acquaintance with the conceptualising quality in OER, with frameworks of quality dimensions and their use in assessment of existing OER; 2) implementation of quality dimensions when developing OER. Both aspects are related, though development of OER is much more challenged and it is precocious to ask the newcomers for such a task.

Challenges with the implementation of OER into curricula are not limited to the teachers' skills to find high-quality resources. Academics must also understand the effective ways to incorporate the materials into their courses and how OER might change their current pedagogic approach. Studies of OER usage indicate that a large number of teachers who have experimented with incorporating OER materials into their courses report that it increased the amount of preparation time needed for those courses [7]. This additional time is needed to identify materials, to adapt them, to conform to their initial intent and pedagogy or to change the own approach to teaching. Other pedagogical issues that should be addressed when implementing OER into courses are related to the use of information and communication technology in the educational process. The challenge that appears is the level of the digital competences the teachers might demonstrate or are eager to develop.

A significant challenge in using OER materials is the legal challenges associated with the academics understanding of copyright and fair usage. Many HE institutions have not enough policy documents regarding intellectual property rights of the faculty-created materials, neither explicit rules concerning fair use of the OER or other resources. Even if an institution has some intellectual property policy in place, there remain challenges over how the teachers interpret and apply these rules. As far as the OER awareness is quite low among the academic community, the fair use, share, reuse and remix of OER is an unexplored area full of uncertainties.

The last but not the least important challenge to be taken into account in the trial to promote the use of OER in Higher Education is that related to costs. The open access to the great amount of diverse educational resources does not mean that their use is at no cost. In fact, the costs are hidden. The OER cost digital divide is encountered in different ways and places. Digital divide is when the institutional and national policy stakeholders do not recognise the time and efforts the teachers put in use and reuse of OER; digital divide is when no technological premises exist to implement the appropriate OER in the classroom activities; digital divide is when the faculty colleagues continue to use traditional outdated or low quality educational teaching aids; digital divide is when competent, enthusiastic to develop OER academics do not have moral and financial support to do this task.

7. Conclusions

The paper presents an attempt to describe the challenges of emerging OER initiatives in the education space of Moldova. The awareness of OER among academics is at early stages and serious efforts are required to promote and to implement the OER till the advanced stage of e-pedagogy. The OER divide is correlated to the digital divide. The teachers' motivations, their digital literacy, and the support provided by training initiatives are the main factors in bridging the gaps. The existing initiatives to mitigate the digital divide are quite modest, rather bottom up, versus top down, individual driven versus institutional structured. Nonetheless, the international practices and the country educational needs prove that there is a growing necessity for all education institutions and policy stakeholders to get engaged in the OER movement.

8. References

[1] ATENAS, J. and HAVEMANN, L.: Quality Assurance in the Open: An Evaluation of OER Repositories. http://eprints.soas.ac.uk/17347/1/30-288-1-PB.pdf, accessed on 25th of November, 2016.

[2] A Study on Open Educational Resources and Their Potential for Use at Texas Colleges and Universities. http://www.thecb.state.tx.us/reports/PDF/6377.PDF?CFID=36540331&CFTOKEN=18703437, accessed on 14th of November, 2016.

[3] Bologna Process at NUI Galway, http://www.nuigalway.ie/centre-excellence-learning-teaching/teachinglearning/bologna/, accessed on 17th of September, 2016.

[4] CAMILLERI, A., EHLERS, U. and PAWLOWSKI, J.: State of the Art Review of Quality Issues related to Open Educational Resources (OER), 2014. http://is.jrc.ec.europa.eu/pages/EAP/documents/201405JRC88304.pdf, accessed on 16th of June, 2016.

[5] Creative Commons. About the licenses. https://creativecommons.org/licenses/, accessed on 12th of December, 2016.

[6] DUMBRAVEANU, R.: Implementing Open Education resources to newcomers, in DisCo 2016 Towards Open Education and Information Society, 11th conference reader, 2016 by Centre for Higher Education Studies Prague. http://www.csvs.cz/konference/disco2016/Disco2016-sbornik.pdf, accessed on 16th of December, 2016.

[7] ALLEN, E.J. and SEAMAN, J.: Opening the Textbook: Educational Resources in U.S. Higher Education, 2015-16. http://www.onlinelearningsurvey.com/reports/oer2016/html/opening thetext book_format.htm, accessed on 30th October, 2016.

[8] Europe 2020 Strategy. https://ec.europa.eu/info/strategy/european-semester/framework/europe-2020-strategy_en, accessed on 15th of October, 2016.

[9] Giving Knowledge for Free. The Emergence of Open Educational Resources, OECD, 2007. https://www.oecd.org/edu/ceri/38654317.pdf, accessed on 30th of November, 2016.

[10] LANE, A.: The Impact of Openness on Bridging Educational Digital Divides. In International Review of Research in Open and Distance Learning, Vol. 10, no 5, 2009. ISSN: 1492-3831, http://files.eric.ed.gov/fulltext/EJ869420.pdf, accessed on 15th of February, 2017.

[11] MARTIN, A.: Digital Literacy for the Third Age: Sustaining Identity in an Uncertain World, eLearning papers, no 12, 2009, https://www.openeducationeuropa.eu/sites/default/files/old/media18500.pdf, accessed on February 15th, 2017.

[12] Moldova. National report. http://www.ehea.info/cid101304/moldova.html, accessed on 24th of December, 2016.

[13] Open educational resources. https://www.jisc.ac.uk/guides/open-educational-resources, accessed on December.

[14] Open Educational Resources (OERs). A Toolkit for Teachers, Curriculum and eLearning Developers. http://www.lib.uts.edu.au/sites/default/files/attachments/page/oer-toolkit---final.pdf, accessed on 14th of February, 2017.

[15] PEÑA-LÓPEZ, I.: Framing the Digital Divide in Higher Education". In: "Redefining the digital divide in Higher Education" [online monograph], Revista de Universidad y Sociedad del Conocimiento (RUSC), vol. 7 no.1 UOC. (2010).http://ictlogy.net/articles/20100118_ismael_pena-lopez_-_framing_digital_divide_higher_education.pdf, accessed on February 16th, 2017.

[16] PEÑA-LÓPEZ, I.: From Laptops to Competences: Bridging the Digital Divide in Education. In: "Redefining the Digital Divide in Higher Education" [online monograph]. Revista de Universidad y Sociedad del Conocimiento (RUSC). Vol. 7, no. 1. UOC. http://ictlogy.net/articles/20100118_ismael_pena-lopez_-_framing_digital_divide_higher_education.pdf, accessed on 16th of February, 2017.

[17] Rethinking Education. http://ec.europa.eu/education/policy/multilingualism/rethinking-education_en, accessed on 30th December, 2016.

[18] ROMOOC Teachers' Continue Professional Training Through Development of Open Online Courses. http://romooc.uvt.ro/, accessed on 30th December, 2016.

[19] State of the Art Review of Quality Issues related to Open Educational Resources (OER). http://is.jrc.ec.europa.eu/pages/EAP/documents/201405JRC88304.pdf, accessed on 20th November, 2016.

[20] Strategia de Dezvoltare a Educației pentru Anii 2014-2020 „Educaţia-2020”, 2014, Monitorul Oficial din 21.11.2014.

[21] Strategic framework – Education & Training 2020. http://ec.europa.eu/education/policy/strategic-framework_en, accessed on 30th of December, 2016.

[22] UNESCO and Commonwealth of Learning, 2011, 2015. Guidelines for Open Educational Resources (OER) in Higher Education, http://unesdoc.unesco.org/images/0021/002136/213605e.pdf, accessed on 25th of November, 2016.

OPTIONS AND POSSIBILITIES OF USING BIOMETRICAL IDENTIFICATION SYSTEMS IN CASE OF DISASTERS IN HUNGARY – IN THE LIGHT OF PRIVACY VERSUS SECURITY

Miklos Polgar[1]

Abstract
There is a need for possibility and application of a new IT hardware and software in case of catastrophes for better intervention. In our opinion these new IT tools are able to make faster and more efficient disaster management in practice. Better to say, the registration of people can became faster compared to the old (e.g. paper-based) systems. A cooperating partner of official disaster management developed a new biometric identification system which can do it. On one hand, it serves security; on the other hand this application raises privacy issues. We can see a conflict between privacy (rights) and security. Where is the balance between them?

I would like to analyse this question, and solve this problem in my presentation.

1. Introduction

1.1 Demand of interdisciplinary solution

Nowadays, we have to face that a particular problem cannot be solved by the results of one branch of science solely, but in fact the common application of a number of fields is necessary. This in effect results in collaboration and interaction between disciplines, or the development of new areas in an increasing way.

The situation and problem which I would like to show and analyse in this article, on the one hand is a practical problem; on the other hand it causes the joint application of different disciplines. The aim of my paper is not just to solve a problem, but rather create and develop new solutions. My article is mixed type, i.e. interdisciplinary.

The main aim is the increasing defence and security in case of any disasters, and to achieve this, the development of new IT applications is necessary. Unfortunately, we must observe and comply with strict rules. Both of the personal rights of people and rights of security are very important and equally unquestionable. What happens when these collide in a specific case? Which current is stronger? May one overshadow the other? If the answer is yes, then to what extent – fully or partially?

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1.2 Teamwork of professional disaster management and civil partners (IT developers) – for the purpose of security

At first, we can say that the most important factor and goal for professional disaster offices is the security and civil protection. It expressed by the slogan of Disaster Management of Hungary: "In the service of Hungary for security".[2] The professional disaster management try to create a better protection system of Hungary than the old one, so they make a number of activities (e.g. fire-fighting, security industry; ADN[3], ADR[4], RID[5], ICAO[6], prevention of catastrophes, elimination of effects of catastrophes). Perhaps, the most important part of prevention is the provision and preparation for all kind of catastrophes. Better to say, the development of capability of disaster management. It means the nonstop expansion of human resources, machines, and IT tools (hardware and software). I am going to write about the last one in my article. The question arises; what were the reasons for the disaster management to begin to cooperate with partners in IT development, and how did they do it? The Disaster Management of Hungary carries out scientific activities in addition to those mentioned above. E.g. organizing of scientific conferences[7], development of disaster tools. Lots of civil partners (corporations, companies etc.), which took part in these scientific events, recognized the importance of the protection of people, and preparation and the development of skills. The cooperation was established between the professional disaster management and civil partners, and they started to develop several tools, applications, and common methods depending on the actual aim. IT partners also joined in the common work.[8]

In the following I would like to show one of the IT applications and the possible legal concerns of it, and – to my hope – the solution.

2. Existing IT applications

2.1 The reason of looking for new (IT) solutions

At first, I have to explain the chapter title, because these applications were developed by the civil partners, the professional disaster management helped only in their use in case of catastrophes. Secondly, there a few new IT hardware and software items which are going to be created based on the request of disaster management in the future. In this chapter I demonstrate a few civilian purposes. How are these civilian tools able to serve the aims of disaster management? In this case it seems that applications solve a concrete problem. It is the identification and recording of people

[2] It is figured on the armour of the National Directorate for Disaster Management, Ministry of Interior.
[3] Official inspection by the Act LXXXIV. 2015 on the promulgation and domestic application of rules of European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (AND) in Geneva 26 May, 2000.
[4] Official inspection by the Decree of Minister for National Development 61/2013. (X.17.) on domestic enforcement of Appendix "A" and B" of European Agreement concerning the International Carriage of Dangerous Goods by Road.
[5] Official inspection by the Decree of Minister for National Development 62/2013. (X.17.) on domestic enforcement of Regulation concerning the International Carriage of Dangerous Goods by Rail (RID).
[6] Official inspection by the statutory rule 25. 1971 on the promulgation of Convention and its amending Protocol of International Civil Aviation signed in Chicago on 7 December 1944.
[7] E.g. conference of "Experiences of flooding of Danube and Drava in Baranya County - science and defence in the service of each other's" on 14-15 October 2015, and conference and disaster prevention drill of "Virus 2016 – prevention and management of biological hazards and regional solutions" on 1-2 June 2016.
[8] The cooperation has many advantages for both, because the disaster management is able to get new IT tools, and the partners are able to get knowledge about demand of disaster management. He can develop new tools, and sell these as innovation.

who take part in rescuing (professionals), or who are at risk. Both of them are important for the disaster management. If the professional rescue team have a lot of members and they must intervene in a large area under poor visibility for a long time, the disaster management always want to know their precise position, and will make the registration and movement (entering and leaving a critical area) as quick as possible.[9] On the other hand, the disaster management often need to relocate people in a safe place. In this case the rapidity is able to save people's lives. The registration, identification and localization of people is too slow and inaccurate with the old and classic tools, and it is necessary to employ many people for it. The old solutions are not adequate to solve new disaster problems. The disaster management started to think about new applications, which can do it. The biometrical identification systems seem to be competent for it. Usually these IT applications are used for classic security purposes (keeping out unauthorized persons of a place, only authorized recipients can read the e-mails, etc.).

2.2 Using of biometrical identification application by disaster management

The most advanced identification applications are the biometrical systems. There are various biometrical identification systems. Biometric identification is a very reliable method, but it has a few disadvantages without advantages; like the need for expensive software and the need for physical contact; some of the physical characteristics may change with time or sickness.[10] Disaster management must be able to use an adequate, quick and cost effective biometrical identification method. We have to take into consideration that we need to use it occasionally, at times of disasters. It is uneconomic, if the disaster management invests in expensive biometrical systems which are used just occasionally. What is the appropriate tool like? It has to be infallible and relatively cheap.[11] We can say that the best of the biometric identification systems is the vein scanner. It is a new invention by a Hungarian company.[12] More precisely, the hardware and application were developed by a Hungarian company to be applied for identification with a vein scanner, which has been manufactured for a few years y Fujitsu Ltd.[13] The innovation is as follows: the PalmSecure system was developed for medical purposes by Fujitsu[14], but it could operate as a security identification system with the help of IT solutions (hardware and software). It is infallible, because the veins of person are totally unique, and human veins are fixed, it is never changed by the time or sickness (except for vein diseases[15]). What is the relation between disaster management and vein scanners? Many companies and institutions of higher education realized the scientific activity of disaster management[16] and became interested in the possibility of cooperation. They try to make products which are useful for disaster management or army purposes, and hope these will be purchased by them. They try to develop the existing IT solutions to be applicable for the aims of disaster management. One of the civil IT partners of disaster management[17] developed a mobile identification application (hardware and software in one block) operating on the basis of a vein scanner. It is a shock resistant portable box which contains a laptop, a vein scanner, a PC camera,

[9] The areas are usually very dangerous, and the leaders have to provide enough rest periods from the members of rescue team, and the continuous saving while the change of rescue teams is happening.
[10] Tajti Balázs: A biometrikus ujjnyomat azonosítás alkalmazásának új lehetőségei, Hadmérnök VII/1. 2012
[11] Neither of them is cheap, but we can talk about relatively cheap, if this tool is adaptable out of times of disasters, in general activities.
[12] http://index.hu/tech/2013/10/02/uj_magyar_talalmany_a_venaszkenner/
[13] http://24.hu/belfold/2012/05/16/nem-kell-kartya-a-venad-azonosit/
[14] https://www.fujitsu.com/us/Images/palmsecure_healthcare.pdf
[15] Dr. Molnár Andrea Ágnes: A human vénák biomechanikai tulajdonságainak in vivo, non-invazív vizsgálata, Doktori értekezés, Semmelweis Egyetem Elméleti Orvostudományok Doktori Iskola, Budapest, 2008
[16] Better to say, the activity of Baranya County Directorate for Disaster Management
[17] The company which developed the software with PalmSecure vein scanner of Fujitsu.

and a scanner. The disaster management has a problem in the area of identification and recording at times of catastrophes, because he wants to operate the fastest system possible for security and defence. It seems that this "box" could be the best system nowadays. How does it actually work? The disaster management have to prepare for the moving and placement of many people at the time of a catastrophe. E.g. many people are relocated to a safe place and the disaster management wants to have a knowledge about the number of people staying there, and wants to register them and let them all in the host destination as fast as possible. In the app of this mobile "box" it is not necessary to use slow paper-based registration and recording. The person who comes to the host destination puts his palm on the vein sensor; then it registries him. The PC camera takes a photo, the scanner scans his identity card, and the IT application creates his profile. It takes about 30-40 seconds, and it is not necessary to work on paper-based terms. Later, when this registered person goes out or re-enters, he only needs to put his palm on the vein sensor and the IT application is able to provide data of the place of this person, and the number of occupants of a location. Usually, there are hundreds of people, who arrive at the host destination at one time, so this IT application is able to do the job of lots people without the slow paper-based system.

On the other hand, the computer, scanner and PC camera are always available, in peaceful times as well.

It is sure that the new IT application is very useful and cost-effective.

What is the obstruction of its application?

3. Legal questions of the application of these IT solutions

3.1 The legal applicability of biometric identification system

First, the national rules and the legal standpoint of the EU are worth investigating, concerning the using of biometric identification systems. The vein scanner identification IT application is a special Hungarian innovation; as far as we know, it is not regulated by the EU; though the general questions of using biometric identification systems have been examined by offices of the EU. We can say that the usage of general biometric identification systems is not prohibited by the EU, moreover it is suggested e.g. in case of passports and travel documents.[18] The rules of using biometric states in passports are intended for terrorism and crime prevention purposes. Two years before the United States made the use of passports containing biometric identifiers an obligatory condition for visa-free travel, the European Commission had published a motion which had obligated the use of two biometric identifiers in passports.[19] Moreover, it caused debates and doubts between the offices and the Members of the EU. The doubts were arisen particularly in the light of proportionality and necessity for security.[20] They argued that it was not necessary to use biometric identifications on passports to guarantee the security of states and citizens, but it endangered it, because of the risk of technical failures and the lack of adequate data protection.[21] Contrasting the

[18] Council Regulation (Ec) No 2252/2004 of 13 December 2004 on standards for security features and biometrics in passports and travel documents issued by Member States.
[19] Nagy Klára: A biometrikus azonosítás új iránya, 76 p., Jog, állam, politika, Győr, 2010
[20] According to advisory opinion of Article 29 Working Party on enforcement of Council Regulation (Ec) No 2252/2004 of 13 December 2004 on standards for security features and biometrics in passports and travel documents issued by Member States.
[21] Nagy Klára: A biometrikus azonosítás új iránya, 79 p. Jog, állam, politika, Győr, 2010

doubts we must mention the advantages of biometric identification system and it is right to examine the balance between advantages of biometrical identification systems and the occasional risks of privacy.[22]

The problems of applicability of biometric identification systems are examined by lawyers in the United States of America. It is worth to investigate the approach of a different legal system[23]. The EU has a member state which has common law legal system, so it is able to affect the rules of the EU. The question of the effects of the identification system on privacy is very important to the federal legislator of the USA, so they have created five principles.[24] These are the following: notice and awareness of collection of information, choice and consent as to how this information can be used, access to the individual's gathered information, and the ability to contest the accuracy of the collected data, integrity and security of data and enforcement of the aforementioned principles.[25] The dilemma of privacy versus security has resulted in high-level solutions, e.g. creating a competent organization, the Privacy Rights Clearinghouse in 1992[26] We can see that the questions of identification in the light of privacy versus security causes dilemmas for all legal systems.

In my opinion, the regulations of the EU do not answer the question of the application of vein scanners, because they control the use of biometric passport types in the light of fight against crime and terrorism. In our case, we try to analyse the question of a new biometric identification system[27] in a different situation from the previous one.[28]

The application of vein scanners in case of catastrophes is not regulated by the EU; it is a new field of law.

3.2 The legal applicability of biometric identification systems in Hungary

The situation of Hungarian offices was difficult when they came across the problem of the application of vein scanners, that is, the complete hiatus of EU regulations concerning it from two points of view. On one hand, the identification by usage of vein scanners is unknown in the EU; on the other hand, the aim of biometric identification is different Hungary. Finally, I have mentioned before that there is no adequate answer by Hungarian offices and judges to the question of adaptability of vein scanner identification for disaster management purposes, because this area is completely new. The case of application of a vein scanner is being analysed by the Constitution Court of Hungary nowadays. This investigation is still going on; no decision has been made yet.[29]

The case is the following: the management of a football club decided to use the vein scanner identification system to supervise entries to the stadium for the purpose of peaceful football matches. It is the idea of management to able to identify and register all of the fans who buy annual passes and disorderly fans will be prohibited to enter the stadium. After the registration of all of

[22] Ioannis Iglezakis, EU data protection legislation and case-law with regard to biometric applications, 3 p. 2013, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2281108
[23] Common law legal system is operating in USA, excepting Louisiana.
[24] Reuven R. Levary, David Thompson, Kristen Kot, Julie Brothers, Radio Frequency identification: legal aspects 15. p. Richmond Journal of Law & Technology Volume XII. Issue 1. http://jolt.richmond.edu/v12i2/article6.pdf
[25] Federal Trade Commission Fair Information Practice Principles
http://www.ftc.gov/reports/privacy3/fairinfo.htm
[26] https://www.privacyrights.org/
[27] Vein scanner.
[28] Quick identification in case of catastrophe.
[29] The vein scanner identification purpose for security of sports matches is analysed by Constitution Court of Hungary.

fans[30] who bought annual passes, the banned people are not able to visit the football matches in this stadium, and they will be identified each time they want to enter at the check points using the vein scanner. The act[31] was modified by the legislator to allow the adaptation of vein scanners for this purpose. A few fans have suggested that there is a problem related to the records. One of them[32] motioned a constitution complaint on 5 January 2015. The application of vein scanner identification violates of rights of privacy[33], right for informal self-determination[34] and the principles of proportionality and purpose limitation[35] based on this motion[36]. He argues that the use of vein scanner for identification (i.e. the registration of personal data of fans) is not necessary to guarantee of security of football matches in the stadium, so the fans' right for privacy is violated in this case.

Before decision, the Constitutional Court of Hungary asked the opinion of Hungarian National Authority for Data Protection and Freedom of Information.[37] The Authority made a legal remark[38] which did not prohibit to application of identification with vein scanners, but proposed amendments to the act.[39] For example, it is necessary to limit the number of personal data used in case of using vein scanners and the duration of personal data management must not be longer than the validity of fan cards. (The Authority wrote in a previous legal resolution[40] that the home address and the mother's name are not required in the identification process.) Better to say, the management of the football club and stadium can only manage personal data just which are necessary to meet the aims. However, they must examine if there are any other ways to achieve that goal (the security of football matches in the stadium), and if the application of a vein scanner is necessary together with personal data management, because of the level of danger (football hooliganism). The Authority called attention to the requirements of proportionality, and purpose limitation. We are waiting for the decision of Constitutional Court of Hungary.

3.3 The adaptability of vein scanner identification in case of disasters – conflict of principles

At first, we have to declare that the result of the examination of the Constitutional Court of Hungary will not give an adequate answer to our case of the question of adaptability of vein scanners, because the aim is different. However, in spite of differences, from this Decision we can infer the legal position of the Constitutional Court of Hungary about the application of vein scanner identification.

The application of vein scanner in case of catastrophes must correlate with the legal principles of Fundamental Law and data protection. What happens if there is conflict between them? Which principles collide with each other?

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[30] The management of the football club registers and manages the personal data of fans; e.g. mother's name, permanent address, date of birth and place etc. three days after the expiry of the validity of a club card.
[31] 72/A. Paragraph Act I. 2004 on Sport
[32] Lawyer
[33] 1. Paragraph VI. Article of Fundamental Act of Hungary
[34] 2. Paragraph VI. Article of Fundamental Act of Hungary
[35] 1-2 Paragraph IV. Act CXII. 2011 on informational self-determination rights and the freedom of information
[36]http://public.mkab.hu/dev/dontesek.nsf/0/99aeb34aebaa6c68c1257dda005de077/$FILE/IV_6_0_2015_inditvany%20anonim.pdf
[37] a) Point 4. Paragraph 38 Act CXII. 2011 on informational self-determination rights and the freedom of information
[38] NAIH-1387-2/2014/J
[39] 72/A. Paragraph Act I. 2004 on Sport
[40] NAIH-4941-3/2014/V

Primarily, I have to mention the right for security[41]. It means, everybody has right to life, and this right contains strict duties of state; public security, and protection to disasters. It is an active right, that is, the state must operate in an efficient defence system, and it must intervene at times of catastrophe. Secondary all of people have privacy law[42], and the right for data protection[43] is a part of this. It is a passive right, e.g. obligation to non-intervention. One side there is an intervention duty of state, on the other side there is a duty of non-intervention of state. What does happen if both of them are at the same time in the (disaster) case? By the practice of Constitutional Court of Hungary, the offices must exam power of them case by case, that is, what is the more important right of person. According to me, the most important of them is the right of life and security, so the state or disaster management offices can subordinate the right of data protection to right of life of person. In addition we must say that the limitation of right of data protection have to be balance with the security and protection. The offices only may restrict data protection rights to an extent, while the life protection requires. In this case the requirement of balance and proportionality is realized.

By my point of view there is no impediment to app the vein scanner identification system on times of catastrophes, if it is bound to abide by the principles of proportionality a purpose.

4. Summary – the possible future

The IT partners of disaster management started to develop new hardware and software which are able to operate and help the rescue work. According to their plans the vein scanner identification system (the box mentioned above) would be connected to a drone. In practice the vein scanner system would record and register all the members of a rescue team who enter a danger zone with the purpose of life-saving. Each member would have an encoder. Having finished an intervention, when the members of the rescue team leave the zone, the vein scanner IT system could indicate if one of them is still in the zone. Since the zone may be a large area, the search for this person may be difficult and may take a lot of time, the commander could use the drone which would fly above the place and detect the person with the help of the encoder.

I am sure the use of vein scanner identification IT applications can be lawful if we follow the principle and purpose of proportionality in data management.

We would like to solve this problem; and it will be possible after the decision of the Constitution Court of Hungary, but we are still waiting for it. The case was discussed by the Constitution Court 7 February 2017, but it did not result in a decision.[44] The application of vein scanners causes lots of disputes among lawyers, and it has not been solved.

In my opinion the Decision of Constitutional Court will make a decision on the application of vein scanners in case of sports events, but not in defence against catastrophes. We must see that protection of life is the first principle, because in the absence of life the other principles (e.g. data protection, privacy) are meaningless and void. There is no use to talk about privacy and personal data protection of a dead person. If the Constitution Court of Hungary prohibits the use of vein scanners in sport arenas, it would not exclude the use of biometric systems in case of disasters with

[41] 1 Paragraph IV Article Fundamental Law of Hungary
[42] 2:42 Paragraph Act V. 2013 on Civil Code
[43] IV Article Fundamental Law of Hungary
[44] http://www.alkotmanybirosag.hu/testuleti-ulesek/az-alkotmanybirosag-2017-februar-7-i-teljes-ulese

the aim of lifeguarding. If the Constitution Court permits the vein scanner systems in sport stadiums, there is no doubt we can use it in case of catastrophes, because the protection of human life is more important than other personal rights.

I hoped that the Constitutional Court of Hungary would make a decision by the deadline of this paper, but it has not happened yet. So this question remains unanswered for the time being.

5. References

[1] Official inspection by the Act LXXXIV. 2015 on the promulgation and domestic application of rules of European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (AND) in Geneva 26 May, 2000.

[2] Official inspection by the Decree of Minister for National Development 61/2013. (X.17.) on domestic enforcement of Appendix "A" and B" of European Agreement concerning the International Carriage of Dangerous Goods by Road.

[3] Official inspection by the Decree of Minister for National Development 62/2013. (X.17.) on domestic enforcement of Regulation concerning the International Carriage of Dangerous Goods by Rail (RID).

[4] Official inspection by the statutory rule 25. 1971 on the promulgation of Convention and its amending Protocol of International Civil Aviation signed in Chicago on 7 December 1944.

[5] BALÁZS, T.: A biometrikus ujjnyomat azonosítás alkalmazásának új lehetőségei, Hadmérnök VII/1. 2012.

[6] http://index.hu/tech/2013/10/02/uj_magyar_talalmany_a_venaszkenner/

[7] http://24.hu/belfold/2012/05/16/nem-kell-kartya-a-venad-azonosit/

[8] https://www.fujitsu.com/us/Images/palmsecure_healthcare.pdf

[9] ÁGNES, M.A.: A human vénák biomechanikai tulajdonságainak in vivo, non-invazív vizsgálata, Doktori értekezés, Semmelweis Egyetem Elméleti Orvostudományok Doktori Iskola, Budapest, 2008.

[10] Council Regulation (Ec) No 2252/2004 of 13 December 2004 on standards for security features and biometrics in passports and travel documents issued by Member States.

[11] KLÁRA, N.: A biometrikus azonosítás új iránya, Jog, állam, politika, Győr, 2010.

[12] IGLEZAKIS, I.: EU data protection legislation and case-law with regard to biometric applications, 2013, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2281108

[13] LEVARY, R.R., THOMPSON, D., KOT, K. and BROTHERS, J.: Radio Frequency identification: legal aspects 15. p. Richmond Journal of Law & Technology Volume XII. Issue 1.

[14] Federal Trade Commission Fair Information Practice Principles

[15] Act I. 2004 on Sport

[16] Fundamental Act of Hungary

[17] Act CXII. 2011 on informational self-determination rights and the freedom of information

[18] http://public.mkab.hu/dev/dontesek.nsf/0/99aeb34aebaa6c68c1257dda005de077/$FILE/IV_6_0_2015_inditvany%20anonim.pdf

[19] NAIH-1387-2/2014/J

[20] NAIH-4941-3/2014/V

[21] Act V. 2013 on Civil Code

An Evaluation of an Implementation of Electronic Document Management in the Ostalb-County of Baden-Württemberg

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Abstract
Whilst most of the literature on electronic document management in public administration focusses on the implementation, papers on evaluations after the implementation are quite rare. Some years ago, this electronic way of administration has been implemented at job centers run by the Ostalb-County (Federal State of Baden-Württemberg, Federal Republic of Germany); so an impartial evaluation was on the agenda. That particular Electronic Document Management, which by 2020 will become mandatory within the public administration of Baden-Württemberg, is a huge step towards a transparent, effective and customer-oriented public administration in the 21st century. Although, it is also obvious, that it is not a "sole remedy", and it is not good for anything on its own, without other aspects, like user awareness and user readiness, it is still a great technical asset. The current paper is mostly based on empirical analysis - except for the introduction of the technological, management and legal background, and connecting fields, like the relevant pieces of EU-regulation, and issues of data security. The assessment was done by staff of the Job Centers of Ostalbkreis, who were interviewed in extensio, so the article is in an overwhelming part based on primary data. This is why the reader will encounter only a few references to the otherwise vast professional literature of the topics involved. The interviews and the assessment carried out by the staff, have been digested in the bachelor thesis of the lead author, Ms. Pahnke. Hence valuable lessons learnt can hopefully be derived from this contribution.

1. Introduction

Electronic Document Management (EDM) is a well known E-Government Application and common in most public administrations in Europe (for an introduction see [1] and [2]). Unfortunately, in Germany, probably due to the highly federative design of the administration, it is not so common. The electronic filing of court documents at local courts in Stuttgart became possible in January 2016 – Decades after e.g. the Austrian Courts introduced such services in 1990[4], or years after the Hungarian court system introduced similar solutions in the mid-2000's.

In German administrative tradition the file and hence the electronic file too, are heavily regulated. Therefore, an implementation of EDM must fully comply with these regulations. According to these laws, especially the VwVfG[5], the written form is mandatory, which means either:

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[4] See https://www.justiz.gv.at/web2013/home/e-government/elektronischer_rechtsverkehr_erv~2c9484852308c2a60123708554d203e7.de.html (as per February 15th, 2017)
[5] Law regulating administrative procedures; it exists both on the level of the Federal Republic of Germany and also in each of the 16 Federal States, so 17 highly identical laws in total.

- Qualified Electronic Signature (QES) according to the eIDAS-Regulation (which replaced the Directive 1999/93/EC)[6];
- De-Mail, a German national solution for secure E-Mail which has been made equivalent to the QES by German law;
- Entering data into electronic forms, which are provided by authorities (e.g. some government portal with user-ID and password);
- Other secure means, which have been declared secure by authorities[7].

The most important step towards E-Government in Baden-Württemberg was the E-Government Law, which entered into force on January 1st, 2016[8]. § 6 leg. cit. requires administrations of the Federal State of Baden-Württemberg to introduce EDM by January 1st, 2022 (sic!)[9]. The law also lists some conditions an EDM solution must meet, which are mostly obvious, like ensuring readability over time (i.e. archiving service; which is btw. also required by eIDAS), ensuring authenticity, etc.

2. The introduction of EDM in the Ostalb-County in 2013

In 2013, EDM has been introduced in all of the four job center locations in the county. Job centers have the function to look after people who receive unemployment benefits and to help them into a new employment relationship. According to German law, such job centers can be managed either by the Federal Employment Agency or by the respective county on its own. Ostalb-County decided to run the centers on its own, employing 174 staff in four locations (see [3], p. 21). The project was planned in 2012 and went live on October 21st, 2013. The people are dependent on the services of the job centers. That is the reason why all processes have to be handled as quickly as possible. The introduction of EDM aimed amongst other things a higher customer satisfaction and more transparency by a uniform management of files - summarized a process optimization.

But in the Ostalb-County the first incentive for inventing EDM was, strange enough, a move to new premises, which did not provide the necessary storage resources, so that there was a strong need for a way of working which demanded less storage resources for paper files. A fully electronic workflow was established, despite the necessity to keep historical (paper) files in a physical archive due to a lack of legal regulations regarding a legally substituting scanning. Some 39,880 file volumes had to be put into external storage, because the new premises did not provide sufficient storage locations (cf. [3], pp. 21).

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[6] Note that the § 3a VwVfG still refers to the SigG which was the implementation of the Directive 1999/93/EC; the law(s) have not been adapted as per today.

[7] See http://www.lexsoft.de/cgi-bin/lexsoft/justizportal_nrw.cgi?xid=146963,5 (per February 15th, 2017); the Online Portal of the Ministries of Justice of Germany.

[8] Note that most other European Union Member States introduced E-Government legislation long before 2016. For the status of E-Government in Germany, which can be considered as quite improvable, see [4], pp. 80.

[9] Note that this is some 20 years after EDM became mandatory in Austrian Government, and also falls about 10-20 years behind Hungary (in case of courts: 20, in case of public administration: 10), and that this legal provision is not applicable for municipal administrations, i.e. town halls and local authorities may still work paper-based.

2.1 Empirical analysis in 2016 (post-introduction of the EDM)

Some time after the introduction Management wanted to evaluate the project, finding out lessons learnt. Hence a Bachelor Thesis was developed, with the goal of an empirical analysis based on interviews with the staff involved or affected by the introduction of EDM in 2013.

For the empirical analysis at one of the four job center locations interviews were conducted. This location in the city of Schwäbisch Gmünd includes 77 employees of the Ostalb-County. The interview partners again were all part of the unit for granting of benefits. Basically everyone of the job centers uses the new EDM but the unit for granting of benefits works with it the most part.

The management decided the selection of interview partners. They tried to select both critical and non-critical employees for the interviews. Therefor the emotions at the beginning of the project were considered. In the end, nine employees and an executive at the age of 25 to 65 were selected.

To check the satisfaction of the users relating to the EDM a standardized guide with open questions was used for the interviews. So all respondents were asked the same following questions (cf. [3], p. 55):

- How the electronic file system has changed your working day? (Advantages/ Disadvantages)
- How do you feel about EDM from today's point of view? (Change Management/ Acceptance)
- Where there any topics in the course of the project in which you would have preferred to be better involved / informed about? (Project Management Issues)
- Which advices would you give other employees who are still introducing EDM ?(recommendation)
- What should be the functions of the future EDM? (Lessons learnt)

Managers have a special responsibility and role in the implementing process. They assume a role model and can promote the acceptance of the project by their behavior.[10] So another interview was conducted with an senior executive. In addition to the questions already listed above the following questions were asked:

- What were the biggest difficulties introducing EDM?
- Which factors do you think are decisive for the successful implementation of a organization project?
- In which parts is still work to do?

[10] Bundesministerium des Innern: Organisationskonzept elektronische Verwaltungsarbeit - Leitfaden für verantwortliche Führungskräfte, 2012, downloadable at http://www.verwaltung-innovativ.de/SharedDocs/Publikationen/Organisation/leitfaden_fuer_verantwortliche_fuehrungskraefte.pdf?__blob=publicationFile&v=1 (as per March 31st, 2017)

When questions are closed, the interviewee has a choice of answers only from a defined grid. In the case of open questions, the interviewee can freely formulate his response, attitude or conviction and is not restricted by a grid of predetermined answers.[11] Since you get very different answers, it is natural that these kind of interviews are harder to evaluate.

These three findings could be derived from the interviews:

- There were no indications that adaption to change is dependent on the age of the employee. Among the younger and among the older participants critical settings were available;
- For nearly all interview partners the advantages of EDM are outstanding now (2016). Only one person stated that there's a draw between the advantages and disadvantages. But a return to paper based work also this person couldn't imagine;
- Opinions may change. Several times rejection against EDM was mentioned. But these rejections existed at the beginning of the project (compared to basic Statement two the difference becomes visible).
- The ex-post review in 2016 unveiled the following notable findings:
    - Neither the organizational chart nor the processes have been altered significantly, the whole introduction of EDM was a "minimal-invasive" operation;
    - Indexing is a critical success factor. Only good keywords enable a fluent workflow;
    - A concept of key-users enabling and motivating their peers is also important for a successful transition;
    - Training is a crucial success factor.

3. Was it a success or failure?

The interviews conducted in 2016 lead to an evaluation by the employees affected. Notable findings were (cf. [3], pp. 33 and the interviews quoted in the appendix of [3])

- Perceived advantages of EDM
    - Increased availability, both in time and ubiquity of the data;
    - Shared access between different hierarchic levels;
    - Gained flexibility when reallocating human resources due to ubiquity of the data, also the possibility of introducing home office work;
    - Environmental-friendliness and no big file lockers in the offices;

[11] See https://www.fragebogen.de/aufbau-der-fragen-bei-umfragen.htm (as per March 31st, 2017)

- Perceived disadvantages of EDM
    - Hardware issues and system failures lead to inability to work;
    - Special requirements of working at computer workplaces call for management attention and specific measures like medicine or tools prescribed for the employees (like special glasses for those in need of such because of working in a largely computerized working environment);
    - Reduction of face-to-face communication with workmates;
    - When dealing with administrative courts, the electronic workflow breaks and paper must be produced[12];
    - The historical files mentioned above were not scanned, hence inconvenience was perceived when dealing with historic cases.

As already mentioned, another important aspect of implementing EDM is the user readiness. This element should not be underestimated because in fact in the end the users decide whether EDM is working successfully or not. This was also the biggest challenge in the Ostalb-County. At the beginning, the project encountered rejection by many employees because they were afraid of the new system or did not see any advantages in EDM compared with their previous paper-based work. Now, three years after implementation, none of the respondents wanted to go back to the paper files. In order to achieve acceptance one should consider e.g. (cf. [3], pp. 36):

- Taking worries seriously and taking them into consideration when proceeding further;
- Communication - so that processes and decisions are transparent for everyone;
- Creating the possibility of participation. By forming employee working groups, ideas and concerns can be introduced in the implementing process. The employee will feel more connected to the project because they can affect it;
- Making the benefits tangible for the users in their daily work. Some benefits of EDM the user will not notice until the system is live or there is the possibility to work with a test version of the EDM (e.g. the benefit that the storage of documents works faster with EDM than in the paper-based system);
- Assisting the employees in the initial phase. Here it can be an advantage to realize assistance on an employee level.

There were many targets before implementing a project like EDM. In the end, the question arises whether they have been achieved and EDM is a success, or not. German public administration has still a lot of work to do and possibilities for improvement. It will be furthermore a learning process. However, the project of the Ostalb-County and especially the feedback of the affected employees

[12] Note that administrative court procedures are common in German Social Laws and hence daily business for job centers.

show that many initial visions could be achieved. The whole staff now perceives the advantages. Nevertheless, they also see areas that can be made even better in the coming period.

4. Practical Recommendations

The following recommendations can be derived from both the analysis and the interviews:

Top Management Commitment

Support of the transition by the top administration officials is as crucial. Only a fully committed authority leadership team can achieve high acceptance.13

Staff involvement and training

Taking time for individual discussions with staff is also crucial for the success. Just the usual mandatory trainings is not sufficient, the project team must take its time to convince the staff members in face-to-face communication. In addition, individual training and coaching must be made available next to the mandatory training, especially in the first weeks after going-live and qualified trainers must be available at very short notice to support those staff members, who are facing issues.

Involve staff

A concept of key-users enables management to get staff really involved. Convince staff and make the project team members is more promising than just to let them be „treated" by the project team.

Do not try to save hardware costs

Cost savings regarding hardware like workplace screens does heavily effect acceptance. Especially at the first introduction of EDM it is better not trying to save costs.

5. Additional Conclusions

One of the major findings of the interviews was that a transition to EDM makes much more sense if it is total, i.e. covers the whole administration. Partial transitions, like only the job center and not the other administrative and juridical authorities / bodies involved in workflows, make less sense. This rather theoretically sounding conclusion could be found in many interviews. Mentioned disadvantages were e.g. the coordination between different departments requires a lot of time because it's furthermore paper based or the fact that they print the whole files when it's necessary to send them to lawyers or other external partners. A gradually implementation includes the risk that in the end the individual solutions are not compatible with each other.

From an overall perspective, the highly federative character of the German Administration, where one Federal Republic interacts with 16 highly independent Federal States and also highly independent municipalities, a common approach must be found. It makes less sense if one level

13 Federal Government Germany, 2009, http://www.verwaltung-innovativ.de/SharedDocs/Publikationen/Presse__Archiv/20100224_anwendungshilfe_change_management.pdf?__blob=publicationFile&v=2, (as per March 31st, 2017)

introduces EDM whilst the others stuck paper-based. So a kind of „big bang approach" seems more recommendable than a one-after-the-other policy of introducing EDM, otherwise the transition may spread through an enormous timeframe, decades even.

6. References

[1] National Archives of Australia, downloadable at http://www.naa.gov.au/information-management/managing-information-and-records/systems/EDRMS/index.aspx (as per March 3rd, 2017)

[2] Bundesministerium des Innern: Organisationskonzept elektronische Verwaltungsarbeit - Baustein E-Akte, 2012, downloadable at http://www.verwaltung-innovativ.de/SharedDocs/Publikationen/Organisation/e_akte.pdf?__blob=publicationFile&v=2 (as per August 30th, 2016)

[3] PAHNKE, D.-M.: Einführung der E-Akte - der Tag danach. Auswirkungen elektronischer Aktenführung auf die Verwaltungsarbeit; Bachelorthesis at the University of Public Administration and Finance Ludwigsburg, Ludwigsburg 2016.

[4] Expertenkommission Forschung und Innovation (EFI): Jahresgutachten zu Forschung, Innovation und technologischer Leistungsfähigkeit Deutschlands 2016; downloadable at http://www.e-fi.de/fileadmin/Gutachten_2016/EFI_Gutachten_2016.pdf (as per April 10th, 2017).

eGovernment and Society III

Living labs – instruments of social innovation in rural areas

Andreea-Maria Tirziu[1] and Catalin Vrabie[2]

Abstract
In a country where nearly half the population lives in rural areas, it is difficult to link concepts such as smart cities, Internet of Things to the local government's priority list. However, lately there have been numerous initiatives to improve access to information using ICT in the rural communities as well. The purpose of this article is not to exhaustively measure the already adopted means, but merely to provide a series of items retrieved as barriers to ICT projects meant to develop these communities. Following the studies conducted so far (in Romania there are about 2,700 communes – the lowest administrative entities of our country), it was observed that the digital divide is found in 100% of these areas. At the urban level – especially in the big cities, pilot projects for developing digital literacy among the elder population had a relatively high success. Such programs have been initiated at the level of the communes whose living standard is higher (the ones that are located near large cities). Their successes, though certainly less visible than in the urban communities, are noteworthy. Most such programs have targeted educational and health fields. The article we propose aims to show these programs' implementation degree in Romania, providing as examples the most successful cases that help the social innovation process. The intention with which we start this study is to create a list of objectives that the initiators of these programs have to take into account during the preparation of those programs.

1. Introduction

Two elements that, over time, have brought significant improvements regarding the modality in which individuals in a society can have access to the services provided by the public administration are computers and, undoubtedly, the Internet [1].

The new digital era is represented by a transition process, therefore the industrial society is transformed into a new type of society, namely the information one [29]. In such a society, information is accessed, processed, stored and sent in a more cheap, quick and easy manner, existing industries are being modified and new ones are being created, thus appearing major effects on citizens [29]. Therefore information society represents a natural extension of the democratic society, which requires information of public interest to operate, being characterized by a high level of data use by citizens in everyday life, in the majority of organizations and institutions [15]. This kind of society uses technology common or compatible with a wide range of personal, social, educational and business activities, while having the ability to rapidly receive and transmit digital data between parties of the process, regardless of the distance at which they are situated [15].

Modern societies rely more and more on digital technologies, therefore it becomes obvious that these technologies impose social changes in order to be successfully used for the communities' benefit. These social changes can be understood as changes in the current way of living, derived from changing the life conditions, the cultural equipment, the population composition or even the

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ideologies, whether appeared as a result of individuals' changes in a group or of the inventions created by them [25].

All around the world, social innovation is seen as the main goal for human development. Over time, the concept was shaped by researchers in order to capture the new technological trends and to provide to policymakers information and mechanisms that will help to add value to the society. Unfortunately, nowadays, while the challenges are growing, the budgets stay limited. For dealing with this situation, "policy labs" have been created which, "through their user-centred design thinking and experimental approaches", can be an instrument of social innovation. Public policy labs are considered to be entities structurally linked to public authorities, that use user-centred and experimental design methods in order to support the policy making and innovation processes which take place in the public sector [35].

In this regard, the European Commission has generated its own EU Policy Lab that, with the help of the European Parliament, has developed a project with the purpose to connect local, regional or national policy labs to the policy departments within the European Commission. This initiative started in June 2014 under the recommendations of the Expert Group on Public Sector Innovation and, moreover, an important event for its achievement was LAB CONNECTIONS, a policy labs meeting of European countries, held on October 17-18, 2016. This gathering had the aim to create a space open for collaboration between policy labs and policymakers at local, regional, national and EU level, addressing policy challenges and trying to identify actions that could solve social problems and find methods to get those actions started [35]. The policy challenges addressed were: 1) connecting digital, physical, natural and social solutions for cities; 2) culture and creative sectors in youth employment; 3) improve practice and policy for youth employment; 4) against segregation in mainstream education; 5) address public perception on migration; 6) mobilize employers for integration of refugees; 7) assist European start-ups; 8) a EU-wide once-only principle; 9) a citizen charter for digital public service; 10) future skills for healthcare professionals [35].

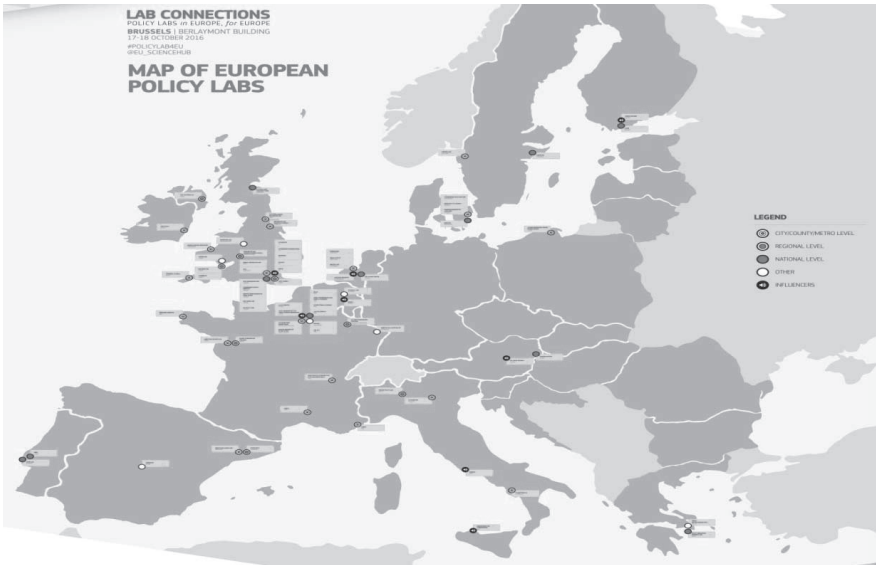

Figure. 1: Map of European policy labs [17]

As we can see from the figure above, Romania has no involvement yet in this project, this putting Romanian urban and rural communities many steps behind the European countries that have understood the importance of having at least one policy lab that can help them generate innovative ideas and put into motion actions which will solve the social challenges that information-based communities raise today.

Although the challenges discussed within the LAB CONNECTIONS project are addressed to cities, they can be of great interest to policymakers for solving social problems of rural areas[3] too and many successful activities are presented on the project's official webpage. Depending on the successful achievement of those activities, this European project can show a new way of connecting, discussing and working with citizens and other actors involved in the process[4]. It can also bring an important contribution regarding the implementation of more relevant and effective EU policies, also helping the EU member states better connect and communicate with their citizens [35].

Moreover, for stronger local policy labs, the NGOs can also be included amongst the interested parties of the process. They can have an important role in opting for various projects that, by providing an experimental approach, can produce visions and results of great value. In other words, NGOs can take the role of supporting the formulation and shaping of new policy initiatives, they can implement new actions for the already established policies and evaluate the existing policies. These organizations can also generate possibilities of consolidating relationships that already exist within the policy lab managers' network, by making the established projects more visible and credible and by offering instruments needed for developing the initial initiatives [12].

2. Social innovation in rural areas

Social innovation is considered to be a concept that "stimulates people, politicians and policy makers to explore and implement new ideas about the way how a society deals with several challenges, such as the increasing ageing of the population, the financial and economic crises, the quality of educational system or the regeneration of socially and economically deprived cities and regions" [21].

When referring to a living lab, the stakeholders of the innovation process (between which a strong interrelationship should exist) are: the companies – which can get new and innovative ideas; the users – which can get the innovation they want/need; the public organizations – which can get greater return on investment regarding the innovation research; and researchers – which can find and share important information on successful study cases [27].

In this context, the actors involved in the social innovation development process represent a very important element, the figure below presenting the role of different actors.

[3] A rural area is an open land field with few homes or other buildings, and fewer people than the urban areas [34].
[4] We can understand that the target groups of living labs are mainly: the users (citizens and community); the SMEs (including micro-entrepreneurs as providers); the larger companies; the research actors, the economy and the society[9].

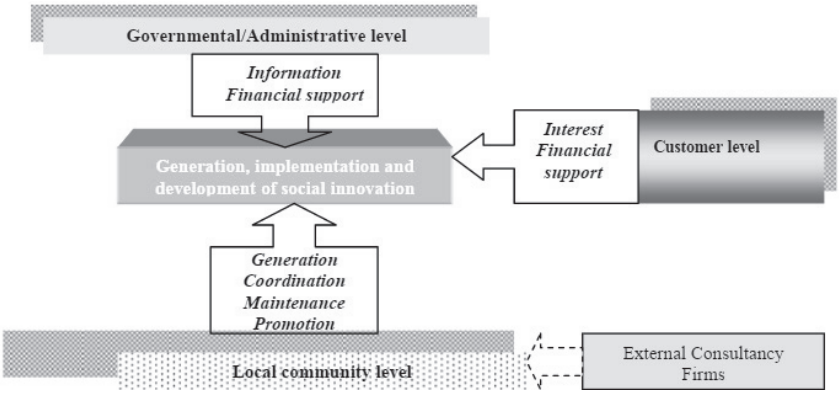

Figure 2: How different actors interplay in the development and implementation of social innovations in rural communities [4]

Figure 2 highlights the fact that, at a local level, there are various forms of social partnerships in order to produce social innovations. Moreover, experts in the field explain that these innovations are implemented in order to support certain ways of development regarding the rural communities or to moderate the negative consequences that may appear when processes are being restructured. Social innovation is believed to be a new concept for rural residents and communities because there are used new methods of development, common actions that can help facilitate the achievement of main objectives, new types of activities that use new forms of organization [4].

In urban and also rural areas, lifestyle changes request and determine innovations [3]. Apart from focusing on ideas, social innovations should concentrate on finding the proper methods to arrange those ideas that sometimes are not even new ones. When ideas are re-shaped in a new way, new quality is obtained from the products or services developed. In this case, it is social innovation the one that makes many changes [4].

There have been set up some elements of social innovation that could serve as instruments regarding process restructuring in rural areas and these are the following: a) new services in rural settlements – for e.g., the local communities should carry out actions that lead to the rural tourism development; b) new education courses for rural people – the main focus is on developing computer literacy[5]; c) ecological farming – a substantial element in restructuring process at a rural level in periods of change; d) formation of local action groups – these can create projects and strategies useful for local development and they can also propose the implementation of various social innovations; f) electronic social innovations – for e.g., local authorities can create for their communities [4].

Apart from the elements mentioned before, social innovation in rural areas tries to carry on objectives, such as: a) the change in attitudes – the most relevant social innovation should be related to this and it should be directed towards following the "bottom up" principle and common ideas; b) consolidation and community development – new things should be created together, by the individuals, and efficiency and profit should be aimed at in order to change the lives of people who live in rural areas; also there should be a mobilization regarding community actions; c) new knowledge – educational potential can help in making profit, therefore it is an essential aspect to

[5] The ability to use computers and related technology efficiently, with a range of skills covering levels from elementary use to programming and advanced problem solving [36].

make use of it; d) environmental protection, new organizational forms and improvement of life quality – these are aspects that should be taken into consideration, especially for helping the process of improving life quality, the community coming with very big expectations regarding this issue [4].

We can easily see that the main actor in developing social innovation in rural areas is the community, the human resource, therefore the successful carrying out of social innovations depends very much on the characteristics of the respective community. The actors involved in the process from a national level should carry out top-down initiatives in order to ease the activities based on a bottom-up approach [4]. Social change is a fundamental purpose of the innovation process, therefore social innovations are considered to be both the wanted outcome and the tool and approach that, through engaging the communities, will help rescue rural societies [3]. For this purpose to be met, the population must be organized and educated in such a manner that it achieves the capability and willingness to engage and re-create the society it forms, and also finding solutions against the barriers that intervene in the change process, by forming influential lobbies for local interest [6].

3. Connection between living labs, ICT and social innovation

The connection between these three concepts can be easily understood by defining the living labs, which are open innovation ecosystems, centered on users and based on an approach that will make the users be co-creators regarding research and innovation processes in real life communities and locations. The citizen is therefore positioned at the center of innovation, these labs having the ability to better make use of the opportunities made accessible by the new ICT concepts and solutions that are being found in order to meet specific needs and desires that local cultures, settings and creativity potentials rise [11].

In this context, The European Network of Living Labs (ENoLL) is a relevant example of how important the connection between living labs, ICT and social innovation is. Founded in 2006, ENoLL is the international federation of benchmarked living labs at European and global level. Today, it counts more than 170 active living labs worldwide, providing to its members co-creation, user engagement, test and experimentation services, having as a main target innovation in various fields of activity. This not for profit association acts as a platform for exchanging best practice cases, learning and support and also for the development of the living lab international project [11].

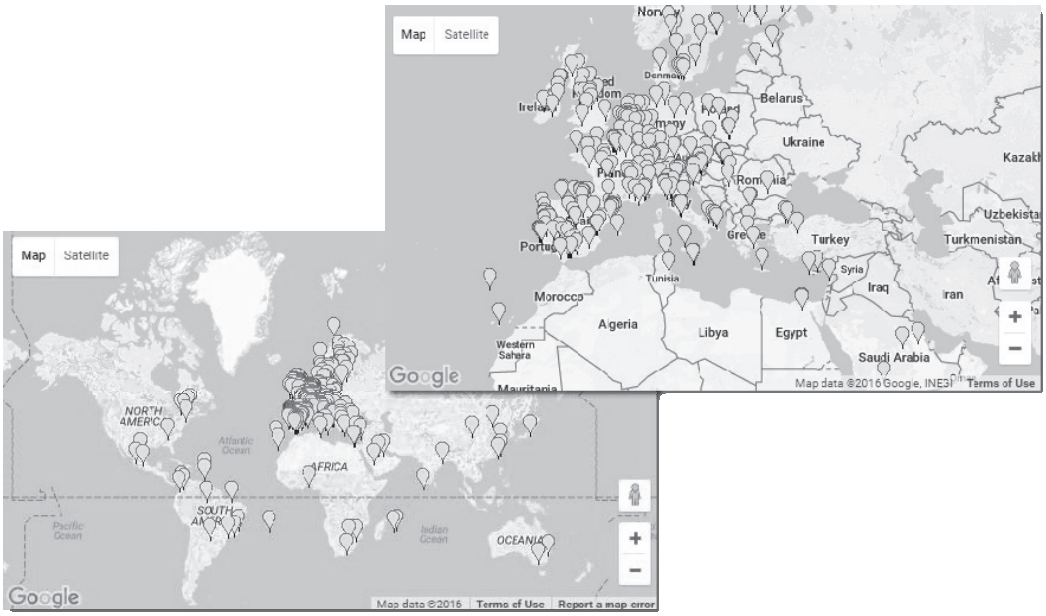

Figure. 3: Living Labs in ENoLL member states [11]

As it can be found on ENoLL's website, Romania is an adherent member and it had a living lab (in Bucharest) named A.R.C.H.E.S[6]. This was launched by University Politehnica Bucharest with the purpose to create, for the first time in Romania, a platform oriented on synergy. Moreover, SIG-RO (a special interest group in Romania) focusing on multi-disciplinary academic research, established ARCHE3S[7] – the Bucharest metropolis-oriented living lab [28].

The contents of this project are sustained by the following elements: 1) rigorous selection of the high-priority complex problems to be solved along their life-cycle – case studies: a) National Remedy project no. 138 (2006-2007) which had the aim to observe the pollutants effects on health; b) In-Tech-Transfer – technology transfer from academic research towards Romanian SMEs within the RELANSIN[8] national programme (2004-2012); 2) interoperability-focused complex problem to support e-democracy, e-government and policy making – Leverage FP7-Strep proposal[9]; 3) stimulate the young generations of students to develop an innovative thinking and have access to entrepreneurship education – e.g.: University Politehnica Bucharest department for lifelong learning in order to sustain the job selection on dynamic European work force market, Business Incubators at the same university etc.; 5) support the awareness of Romanian citizens living in Bucharest regarding the complex public services that are based on Internet use [28].

[6] This Living Lab is no longer an active member of the ENoLL network since 2010 [11].
[7] ARCHE3S is described by the public-private initiative focused on: automation, robotics, computers, science, healthcare, energy, efficiency, environment sectorial activities, based on coherent, consistent and competitive system of systems approach [28].
[8] The purpose of this program is the economic re-launch of units, groups or categories of economic units, with Romanian majority capital, by implementing integrated projects covering both the research and development process, and the one of achieving the investment needed in order to obtain the expected economic results [19].
[9] STREP (Specific Targeted Research Projects) are multi-partner research, demonstration or innovation projects and their aim is to support activities of a more limited purpose and ambition than the large scale integrating collaborative projects (IPs) [10].

The successful examples of urban living labs from around the world can also be of interest for Romanian local authorities in order to produce impact on rural development through the development of the rural innovation system, change of current rural policies, impact on business and entrepreneurship, on social and individual welfare and also impact on internationalization [24]. Moreover, the public administration plays an important role in enhancing the creation of innovations and the use of ICT for developing living labs and, thus, for increasing productivity, boosting the creation of public value, improving efficiency in the relationship between the citizens and the public authorities, meeting the challenges that today society raises [20].

4. Barriers to ICT projects meant to develop rural areas

Research on rural areas has shown that increasing the possibility to access ICT and their applications has become an important policy issue for the future development of those rural regions. This also brings benefits for the citizens, firms and rural communities, ICT having the potential to develop an open digital platform that will make effective and efficient interaction possible, thus gathering intelligence in a unique place. They can also help both the macro level (represented by the rural areas) and the micro level (constituted by individuals and companies) to boost their competitive position in the new economy context [30].

Regarding the barriers that intervene in the development of ICT projects meant to boost the development process of rural areas, we can see that there are various categories that need to be taken into consideration [30]:

a) Barriers related to the network infrastructure organization: costs for the deployment of the infrastructure, lack of sufficient demand [14]; diversity of ICT applications which can meet the needs of rural communities and the requirements related to the network infrastructure; lack of continuous and high speed network connections;

b) Barriers related to the development of specific ICT applications and content: rural areas may lack of access to proper equipment necessary for the development of specific applications, costs involved; lack of knowledge regarding the range of applications, lack of regionally-focused and demand-driven approach to categorize various needs; costs for the content development [23]; applications and content developers may not have knowledge on the regions' specifics and their needs; obstacles regarding the management of digital content;

c) Barriers related to the adoption and use of technology by end-users: lack of skilled human resource; lack of institutional capacity; limited range of e-government services that use open IT standards; low level of entrepreneurship; lack of training opportunities; lack of new technology culture etc.;

d) Barriers related to limited or missing capacity of network infrastructure in regard to the type of applications or the content that could meet the needs of rural areas: lack of region-specific and demand-driven approach to network infrastructure and ICT applications; multiplicity of network requirements specific to applications in rural areas;

e) Barriers related to the type of network infrastructure chosen for supporting e-apps in rural context: the type of network infrastructure technology should be in compliance with the rural communication design [13]; lack of establishment of multi-devices or multi-channel access

[16]; behavior of local population; costs regarding the network infrastructure use; costs for getting access to the equipment needed for joining the network;

f) Barriers related to the type of apps and content specific for different types of end-users: lack of user-oriented knowledge development; lack of efficient interaction between researchers as developers of ICT apps and end-users [23]; lack of users' involvement in the apps' design or content [18]; non user-friendly apps; lack of multi-channel digital communication system for integrating all media [16]; costs regarding the access or use of the ICT apps and content.

Apart from these constrains, the digital divide should be mentioned. The overall potential of the EU is slowed down by a divide regarding innovation and, mostly, digital skills, along with heterogeneity in the enterprise environment [38]. In this regard, it would be very useful to create and put into motion national or even local projects meant to inform and train the population in order to be capable to use the new ICT, this process being called "digital literacy" [2][37].

Solving these problems could mean finding the objectives that need to be taken into consideration when the social innovation programs are being prepared, therefore policy and decision makers should pay attention to these issues and try to find the most effective and efficient manner to contribute to the development process of their local communities.

5. Case study: successful programs that help the social innovation development process in rural areas

5.1 European case

At the European level, there are two projects that we consider as being of great importance for our research, focusing on boosting social innovation in rural areas.

The first one is a project called SIMRA (Social Innovation in Marginalised Rural Areas) which is a four-year action period (2016-2020), being funded by the EU's Horizon 2020 programme. Its purpose is to improve the understanding of concepts such as social innovation and innovative governance in the forestry, agriculture and rural development fields and find methods to enhance them in marginalized rural areas from Europe and around the Mediterranean, including zones situated in states that are non-EU members [26]. This project's objectives will be carried out by realizing the following activities:

"1) Developing systematic frameworks: a) theoretical – for improved knowledge of the complexity of SIs and its dimensions, and its impact on unfolding territorial capital; b) operational – based on a trans-disciplinary coalition (researchers and practitioners) to advance understanding of preconditions and success factors for implementing/operationalizing SI;

2) Creating a categorisation of SIs which encompasses the specificities in terms of social priorities, relationships/collaborations etc. and serves as an instrument to explore reasons why regions with similar conditions display diverging paths and to 'turn diversity into strength';

3) Creating an integrated set of methods to evaluate SI and its impacts on economic, social, environmental, institutional and policy dimensions of territorial capital;

4) Co-constructed evaluation of SIs in case studies across the spatial variation of European rural areas, considering which components of territorial capital foster and, or mainstream RD;

5) Synthesis and dissemination of new or improved knowledge of SIs and novel governance mechanisms to promote social capital and institutional capacity building and inform effective options/solutions for shaping sustainable development trajectories;

6) Creating collaborative learning and networking opportunities and launching innovative actions at different/multiple scales, with continuous interactions among researchers, 'knowledge brokers' and stakeholders to foster and mainstream SI, leaving a durable legacy" [7].

Another European project example is RurInno, which is a project for which award-winning social enterprises and high-profile institutes from four EU states work together in the Horizon 2020 programme with the aim to boost rural development [22]. It "strives to enhance knowledge about social enterprise driven innovation processes and at the same time to utilise the insights to improve the ability of social enterprises to tackle social challenges in rural regions" [5].

5.2 Romanian case

While at the European level there is a strong interest in developing living labs as instruments of social innovation in rural areas, in Romania public authorities barely heard about this issue. Back in 2005, a project entitled eComunitate [eCommunity][10] was developed, following the knowledge of the economy concept, under the auspices of the Ministry of Information Technology and Communications. The program's main objective was to connect all the communes in one single place on the Web in order to share knowledge and information for a better and cheaper interaction among the authorities [8]. Even though the project is ten years old already, not the entire rural community in Romania adhered to it.

The table below has the aim of presenting the activity of the most active communities which are members in the project "Economy based on Knowledge (EBK)"[11]. It shows the events, news and other interest subjects from the rural areas, shared through the eComunitate portal. One point is accorded for each material that comes from the community and covers local news or events and is of interest for the editorial team and two points for each item or success story that comes from the community and is of interest for the editorial team [8].

[10] The eComunitate portal is an initiative launched within the project "Economy based on Knowledge" [8].
[11] The total no. of communities presented on the website is equal to 231, but we chose to present the 10 most important ones based on the criteria researched and provided under the auspices of the project.

Position	Community	Project	Education	Business	Administration	Culture	Total
1.	Recaș	22	39	18	19	17	**115**
2.	Luncaviţa	24	9	30	40	8	**111**
3.	Sângeorgiu de Pădure	6	25	27	42	9	**109**
4.	Teiu	7	79	6	6	8	**106**
5.	Homocea	2	30	32	20	4	**88**
6.	Diosig	6	24	25	25	2	**82**
7.	Târgu Frumos	9	27	3	16	22	**77**
8.	Zlatna	8	19	21	29	0	**77**
9.	Mircea Vodă	7	18	11	25	8	**69**
10.	Saschiz	6	5	15	26	15	**67**

Table 1: Top ten EBK communities most active on the eComunitate portal [8]

6. Conclusions

By taking into consideration the living labs successful examples from all over the world, rural areas can become smarter communities, making use of ICT activities that will help them create social innovations and sustain development.

Social innovation is a practice that can be made possible through the process of creation. In this regard, we believe that ICT is very useful in making the individuals "think outside the box" and come up with ideas that can transform their communities. By that, they can be even more creative and they will become responsible citizens that will be able to find solutions for the society they live in [31].

For the benefit of citizens and rural small businesses, efficient electronic services must be developed. Therefore, the public institutions must embrace a more general approach, by evaluating the electronic services already in use and by creating new ones where and when they are needed [33].

However there must be remembered that, although electronic technologies provide important aid for social innovation and the improvement of the rural areas' well-functioning and development, the key factor in any interpersonal relationship remains the human resource, therefore the interaction between individuals should not be absolutely suppressed, but a balance must be found between the use of digital technologies and traditional methods in order to perform certain actions [32].

7. References

[1] BALTAC, V.: Information technologies – Basic notions, Andreco Educational, Bucharest, 2011.

[2] BALTAC, V.: Miths and reality in the digital world, Excel XXI Books, Bucharest, 2016.

[3] BOCK, B.: Social innovation and sustainability; how to disentangle the buzzword and its application in the field of agriculture and rural development, Studies in Agricultural Economics, no. 114, 2012.

[4] BUTKEVIČIENE, E.: Social Innovations in Rural Communities: Methodological Framework and Empirical Evidence, Social Sciences, no. 1 (63), 2009.

[5] CHRISTMANN, G.: Personal communication from the deputy director of the Leibniz Institute for Research on Society and Space, Germany, RurInno project partner, RurInno website, http://rural-innovations.net/articles/2016/5/30/social-innovations-in-rural-regions-launch-of-eu-horizon-2020-project, accessed on December 2016.

[6] CONVERY, I. et al.: Mainstreaming LEADER delivery of the RDR in Cumbria: an interpretative phenomenological analysis, Sociologia Ruralis, vol. 50, no. 4, 2010.

[7] CORDIS (Community Research and Development Information Service), http://cordis.europa.eu/project/rcn/200385_en.html, accessed on December 2016.

[8] ECOMUNITATE PORTAL, http://www.ecomunitate.ro/, accessed on December 2016.

[9] EUROPEAN COMMISSION – DIRECTORATE GENERAL FOR THE INFORMATION SOCIETY AND MEDIA, Living Labs for user-driven open innovation. An overview of the living labs methodology, activities and achievements, Office for Official Publications of the European Communities, Luxembourg, 2008.

[10] EUROPEAN COMMISION WEBSITE, http://cordis.europa.eu/fp7/ict/future-networks/funding-schemes_en.html, accessed on December 2016.

[11] EUROPEAN NETWORK OF LIVING LABS (ENoLL) WEBSITE, http://www.openliving labs.eu/aboutus, http://www.openlivinglabs.eu/ourlabs/Romania, accessed on December 2016.

[12] FULLER, M. and LOCHARD, A.: Public policy labs in European Union Member States, EUR 28044 EN, Publications Office of the European Union, Luxembourg (2016).

[13] GOUSCOS, D., MENTZAS, G. and GEORGIADIS, P.: *Planning and implementing e-Government service delivery: achievements and learnings from on-line taxation in Greece*, paper presented at the Workshop on e-Government, 8th Panhellenic Conference on Informatics, Nicosia, Cyprus, November 8-10 (2001), cited by STRATIGEA, A., ICTs for rural development: potential applications and barriers involved, Netcom, 25 – ¾, 2011.

[14] HAMMOND, A. and PAUL, J.: *A new model for rural connectivity*, World Resources Institute, Development Thought Enterprise (2006), cited by STRATIGEA, A., ICTs for rural development: potential applications and barriers involved, Netcom, 25 – ¾, 2011.

[15] HELLAWELL, S.: The Net Result – Social Inclusion in the Information Society, Report of the National Working Party on Social Inclusion (INSINC), IBM United Kingdom Limited, London, 1997.

[16] KASTELLS, M.: *The rise of the network society, the information age: economy, society and culture*, Volume I, Wiley-Blackwell, West Sussex, UK (2010), cited by STRATIGEA, A., ICTs for rural development: potential applications and barriers involved, Netcom, 25 – ¾, 2011.

[17] LAB CONNECTIONS, http://blogs.ec.europa.eu/eupolicylab/lab-connections/, accessed on December 2016.

[18] LIND, M. et al.: *Integrated broadband development, use and learning in a co-design setting: case study e-Me infrastructure*, BIRD Project – Broadband Access for Innovation and Regional Development, European Community, European Regional Development Fund (2008), cited by STRATIGEA, A., ICTs for rural development: potential applications and barriers involved, Netcom, 25 – 3/4, 2011.

[19] MANAGERIAL AGENCY FOR SCIENTIFIC RESEARCH, INNOVATION AND TECHNOLOGY TRANSFER (AMCSIT) – POLITEHNICA WEBSITE, http://www.amcsit.ro/amcsit.old/relansin.html, accessed on December 2016.

[20] MATEI, A., SĂVULESCU, C. and ANTONOVICI, C.: Social Innovation in the Local Public Sector: A Cross-Regional Approach for Romania, Theoretical and Applied Economics, vol. 22, no. 4(605), 2015.

[21] MULGAN, J.: The art of public strategy, Oxford: Oxford University Press (2009), cited by MATEI, A., SĂVULESCU, C., ANTONOVICI, C., Social Innovation in the Local Public Sector: A Cross-Regional Approach for Romania, Theoretical and Applied Economics, vol. 22, no. 4(605), 2015.

[22] RURINNO WEBSITE, http://rural-innovations.net/articles/2016/5/30/social-innovations-in-rural-regions-launch-of-eu-horizon-2020-project, accessed on December 2016.

[23] SCAR FORESIGHT COMMITTEE (2007), *FFRAF report: foresighting food, rural and agri-futures,* Standing Committee for Agricultural Research, Version 20, February 2007, http://ec.europa.eu/research/agriculture/scar/pdf/foresighting_food_rural_and_agri_futures.pdf, cited by STRATIGEA, A., ICTs for rural development: potential applications and barriers involved, Netcom, 25 – 3/4, 2011.

[24] SCHAFFERS, H., MERZ, C. and GUZMAN, J.G.: Living Labs as Instruments for Business and Social Innovation in Rural Areas, work partly funded by the European Commission through IST Project C@R: Collaboration@Rural (No. IST-2006-34921), 2009.

[25] SHAH, S.: http://www.sociologydiscussion.com/sociology/theories-of-social-change-meaning-nature-and-processes/2364, accessed on December 2016.

[26] SIMRA (Social innovation in Marginalised Rural Areas), http://www.simra-h2020.eu/index.php/newsletter/, accessed on December 2016.

[27] STÅHLBRÖST, A. and HOLST, M.: The Living Lab Methodology Handbook, Social Informatics at Luleå University of Technology and CDT – Centre for Distance-spanning Technology, Sweden, 2012.

[28] STANESCU, A.M. et al: ARCHE3S: first Living Lab enabler in Romania aiming at cross domain synergy-based approach to sustain SMEs, University Politehnica Bucharest, 2015.

[29] STOICA, M.: Premises of transition to information society, Economic Information Journal, no. 4 (16), 2000.

[30] STRATIGEA, A.: ICTs for rural development: potential applications and barriers involved, Netcom, 25 – 3/4, 2011.

[31] TIRZIU, A.M. and VRABIE, C.I.: NET Generation. Thinking outside the box by using online learning methods, New Trends and Issues Proceedings on Humanities and Social Sciences, issue 8, SPROC, 6th World Conference on Learning, Teaching and Educational Leadership (WCLTA 2015), October 29-31, 2015, Descartes University Paris, France, 2016.

[32] TIRZIU, A.M.: Social innovation – a beneficial vision on the public sector. Case study: social innovation in the public universities from Italy, vol. 3 of the "Smart Cities" Conference, 3rd edition, December 10, 2015, Pro Universitaria Publishing House, SNSPA, Bucharest, Romania, 2016.

[33] TIRZIU, A.M. and VRABIE, C.I.: Education 2.0: universities' e-learning methods, LAP Lambert Academic Publishing, Germany, 2015.

[34] TRADING ECONOMICS, http://www.tradingeconomics.com/romania/rural-population-percent-of-total-population-wb-data.html, accessed on December, 2016.

[35] URBACT: http://www.blog.urbact.eu/2016/12/lab-connections-policy-labs-in-europe-for-europe-policylab4eu/, accessed on December 2016.

[36] U.S. CONGRESS – OFFICE OF TECHNOLOGY ASSESSMENT, Computerized Manufacturing Automation: Employment, Education, and the Workplace, Washington D.C., OTACIT-235, April 1984.

[37] VRABIE, C.: IT elements for the Public Administration, Pro Universitaria, 2nd edition, vol. 2, Bucharest, 2014.

[38] WORLD ECONOMIC FORUM, The Europe 2020 Competitiveness Report: Building a More Competitive Europe, Geneva, 2014.

THE BEST PRACTICES OF ONLINE PRESIDENTIAL COMMUNICATION IN DEMOCRATIC STATES ROMANIA, REPUBLIC OF MOLDOVA AND RUSSIAN FEDERATION

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Abstract
The Presidential Communication is defined as the dissemination, by the president or the presidential institution, of the public or national interest information. The interactive model, with its connotation of public deliberation renovated form, is the most egalitarian and democratic model of presidential political communication.

Currently, in most European democratic states, the "true public deliberation" is favored by political websites which allow the two-way communication and the three-way communication. Among the most interactive elements of the websites the researchers have identified the following: active e-mail to political leader or contact forms, e-subscriptions, forums, site search engine.

Presidency website is the main form of new media involved in the presidential political communication of the Republic of Moldova. Mapping the website, content analysis, interpretation of results - are the methods which have been used for the purposes to assess the effectiveness of communication between Head of State and citizens from the online environment. Contrastive analysis of new media, applied for the presidential communication by Nicolae Timofti, Klaus Iohannis, Vladimir Putin, has served to determine the best practices and to develop recommendations for optimizing online presidential communication of the Republic of Moldova.

Key words: *presidential communication, new media, interactivity, public deliberation, democracy.*

1. Introduction. Theoretical and Methodological aspects

Presidency website is the main form of new media involved in the presidential political communication of the Republic of Moldova. Mapping the website, content analysis, interpretation of results - are the methods which have been used for the purposes to assess the effectiveness of communication between Head of State and citizens from the online environment. Contrastive analysis of new media, applied for the presidential communication by Nicolae Timofti, Klaus Iohannis, Vladimir Putin, has served to determine the best practices and to develop recommendations for optimizing online presidential communication of the Republic of Moldova.

2. Contrastive and content analysis of new media

The official website of the Ex-President Nicolae Timofti was created in 2013 and summarizes the Moldovan Presidency's efforts concerning the promotion and visualization of political activity of the president. Overall, we note that this online communication platform tends towards the respect of

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international standards regarding the creation of institutional websites, including in the category of *technical aspects* the following elements: sitemap, site search engine, information in various formats (text, images, audio, video), the print button for articles, external links. The chromatic of this website home page, expressed by the alternation of the two dominant colors - blue and white, corresponds to the action to popularize the message of the President and to strengthen the image of the country's most important political actor. The experts in the field have found that cool shades, especially blue and green colors, are associated by receivers of political information with the condition of state security, pragmatism and professionalism. The white color is considered by semioticians as active one, which gives brightness, clarity, and the feeling of closeness to the object. Thus, the chromatic message of presidential official website complies is within the limits of traditional discourse, ritualized and sober, being fully consistent with the tasks of the Head of State as the guarantor of "national sovereignty, independence, unity and territorial integrity" [7]. In the upper part of the main page of this official website is another important visual element - the State Emblem of the Republic of Moldova, which enhances the communication semantics, giving it a surplus of sobriety and credibility by the presence of this major symbol of independence and indivisibility of the Republic of Moldova. In the lower part of this page, the line decorated in traditional style suggests the idea of stability and respect for the tradition and the country's historical past, and as while the image of national flag inserted into a circle - express the message of the fourth President of the Republic of Moldova (elected by Parliament on 16 March 2012) to promote the state policy of adherence to the EU.

The official website of Mr. Klaus Iohannis, the President of Romania, complies with the same strictness on chromatic aspect: deep blue color outlines the upper part of the site, with links to the main information and the lower part of the first page of that online communication platform. The white color occupies more space - the middle part of this website. Nevertheless, the titles and characters too small, in blue color, diminish the ability for and reading and receiving the political message. So, the overall image of this site, resulting in alternating of white and blue expresses a speech perceived on the basis of main visual elements as cold, too rigorous and distanced from the public.

On the official website of Mr. Vladimir Putin, the President of Russian Federation, prevail the both shades of blue – dark and light blue, which marks the contrast between the upper, the lower and the left parts of the website, where is the list of main information, and the middle part of this online communication platform, where this information can be accessed, viewed and received by the Internet users. Unlike the official website of Mr. Nicolae Timofti, the Ex-President of the Republic Moldova, the online communication platform of the President of Russian Federation includes only the State Emblem of as a visual element, the nation flag being present only in the section *State insignia* and on some photos were can be seen the most important moments of the activity of the Chief of the State.

By studying the rich history of the blue color and its semantics in the context of social codes of the modern state, Michel Pastoureau concluded that it is the favorite color of most Western European states [5]. Important international organizations as United Nations, the Council of Europe, the European Union chose this emblematic color for the connotation of major political values: peace, solidarity, freedom of speech. In the case of the official website of Mr. Nicolae Timofte, the Ex-President of the Republic of Moldova, the use of the light blue in the process of political communication is the expression of the message focused on maintaining stability and unity of the State. The Deep blue color from the official website of Mr. Klaus Iohannis, the President of Romania, expresses his calm nature and his tendency for action with slow but certain steps towards

the development of a prosperous democratic European state. The contrast between light and dark blue from the official website of Mr. Vladimir Putin, the President of Russia, expresses the message of a powerful political leader, authoritarian personality and the main guarantor of the respect of the Constitution, of rights and freedoms of citizens of the state that he represents.

Prof. Calin Sinescu, Romanian specialist in political science, said that one of the first uses of the Internet was as "an important source of political information" and "strategic tool", which according to survey results has demonstrated, during the election period, the ability to increase the number of voters, helping them by providing the necessary information "to decide for whom to vote" [6, p. 250]. In the case of political websites, he delimits all the information posted on these online communication platforms into three basic categories: 1. data for external public, 2.information for journalists, 3. information for the militants.

The Presidential Communication, as institutional political communication, can be included in the category of a permanent electoral communication, ensured by the continuous flow of information regarding the activity of the Chief of the State and concerning the Presidency. The official websites of Presidents took over this basic function of new media, focusing, first of all, on informing citizens, contributing to the formation and consolidation of civil society political culture. The structural investigation of official website of Mr. Nicolae Timofti, the President of the Ex-President of the Republic of Moldova, has allowed us to identify the presence of the following categories of information in the list from the left part of the home page:

1. *President* (with the following compartments: Biography, Status and Powers, Oath President, History);

2. *Press Service* (where are presented: Press Releases, Speeches and Messages, Interviews, Photo Gallery, Video Gallery);

3. *Supreme Security Council* (where can be accessed and can be reading Releases, information on the structure of the Supreme Security Council and legal framework);

4. *Administration of the President* (with the list of officials - staff members of this structure);

5. *First Lady* (where are posted the following information: Biography, Social involvement, Events, Interviews, Photo Gallery, Video Gallery);

6. *Republic of Moldova* (where are posted, can be accessed, printed and read the two very important documents for the development of state of law Republic of Moldova: Declaration of Independence of the Republic of Moldova and Constitution of the Republic of Moldova, data on state symbols, list of links to official websites of relevant organizations (Parliament of the RM, Government of RM, Constitutional Court of RM, Supreme Court of RM, National Bank of Moldova, Academy of Sciences of Moldova, Chamber of Commerce and Industry of the Republic of Moldova etc.), the link to initial version of the official website of the President of RM);

7. *Transparency in decision making process* (which includes: Decision elaboration, Draft Decisions, Adopted Decisions, Annual Reports - categories that can be accessed, but not containing any information, we can read only the name of a content, which we hope to be posted in the future to inform citizens).

In the bottom left part, on the home page of the site www.presedinte.md, we find, in red border, the section *Constitution of the Republic of Moldova,* which allow us to view the same content as the information posted in the compartment *Republic of Moldova*. The contrast of red and white colors and the name of the important document written entirely in capital letters suggest the webmaster's trend to equip this platform of renovated official web-page of the Presidency with technological elements that facilitate browsing and finding useful information. For the same purpose, in the upper right part of the home page of this website are posted (below the most recent photo of the President) the following compartments with online information: *Press Releases, Photo Gallery, Video Gallery.* The section *Contact* (from the left lower part of the main page of this site) includes two address and contact numbers of the Presidential Administration, contact details (including name, contact numbers, e-mail) of the following officials: Chief of Petition and Audiences Section, Chief of Citizenship an Reprieve Service, Chief of State Award Service, State Heraldist, Senior PR Consultant. Thus, the only way to establish a direct dialogue with the president becomes possible only by accessing the Facebook and Twitter pages of Moldovan President.

The specialists in the field have delineated, in order to obtain precise results in the case of quantitative analysis of political websites, the following information indicators: biography of the political leader, data on his political activity, slogan, fragment of the discourse by which is succinctly expressed the political commitment of communicator, press releases, press reviews, news, agenda events, calendar of main activities, e-subscriptions, site search engine, links to other official websites, links to Facebook, Twitter, YouTube, popular social networking sites (Ok.ru, vk.com). The presence of these structural elements of a political website allow having an asymmetric communication characterized by unidirectional flow of information, low level of online interactivity, most frequently known in the case of institutional political websites as one-to-many model of communication. Systematizing the amount of information posted on the official website of the President of Moldova, we identify, on the basis of the criterion *topics and frequency of updating messages* the following three main categories of information:

1. general information about the Chief of the State, data on the presidency and the country that he represents (not upgraded or discounted rarely, only if this is necessary);

2. information for the press service, downloaded and later released to the public (which includes: photo gallery, audio gallery, speeches and press releases of the main political leader of the country - information updated weekly or more often, depending on the agenda);

3. data concerning the biography and the activity of the First Lady Margarita Timofti (related to social involvement, his participation in events, interviews, photo gallery, video gallery, updated often - according to the calendar of events).

Therefore, the official website used for the institutional political communication by Mr. Nicolae Timofti, the Ex-President of the Republic of Moldova, contains (in the basis of information indicators) the main structural elements that ensure the distribution of a complete political message, well reviewed by the press service and his advisers. The frequent updates of the compartments *Photo Gallery* and *Video Gallery* are the unique interactive elements for such communication as a monologue and with low level of receiver control. Despite quality of the images and sound, as well as the use of the best technical parameters for creating a web-site, the online communication platform www.presedinte.md is an official website in the form of booklet. The impossibility of bidirectional communication, at least as responsive dialogue, is augmented by discourses formulated at the third person singular (in the case of messages concerning the activities of the

President - press releases and interviews) or at the first person singular in section *Speeches and Messages* (98% of this information being addressed to the chiefs of other countries), the absence of contact information of the President, active e-mail address or the option for sending a letter addressed to the President. This interactive element, considered a first step in establishing two-way communication between the Chief of the State and citizens, was present in the old version of the official website of Moldovan Presidency (it could be accessed in the sections *Republic of Moldova, Useful Links*), but for unclear reasons it has not been retrieved (like some rarely updated information) on the new online communication platform.

We find a similar situation in the case of the analysis of the official website of the President of Romania. This online communication platform has only one interactive element that can be accessed from the bottom of the home page - the option *Send a message to the President*.

Russian citizens have the possibility of direct dialogue with the President due to the following interactive elements:

1. *Send a Letter to the President* (includes: the rules concerning the conditions for sending an online message at the attention of the Chief of the State, the options *Send a letter* and *Report corruption cases*);

2. *Reception of citizens* (with contact information: number of the phone free of charge for citizens living in Russia, conditions and hours of receipt);

3. *Online reception of citizens* (allows users to submit an online petition, directly on this website, procedure followed by the delegation in the territory of the specialists in order to identify and solve the problem);

4. *The electronic antechamber of the President of Russian Federation* (it is an information system that offers the possibility of a direct dialogue with officials from the Antechamber of the President, works through terminals installed in local administration buildings in 192 cities, with a total of approx. 70 000 inhabitants, situated at a distance of 100 km. from the city of Moscow);

5. *Information* (this section contains useful information and telephone numbers that can be used for consultations with Russian President Administration employees, the telephone number where can be sent free SMS).

All these options are part of the page *Receiving messages*, managed by the team of specialists in the field - employees of the *Presidential Directorate for Correspondence with Citizens and Organizations*. The option *Monitoring messages* presents vast statistical information concerning the number of interventions by Russian President or the Presidential Administration in solving various social problems reported on this official website due to the interactive process of political communication. Thus in October 2015, on the official website of the Mr. Vladimir Putin, the President of Russian Federation, was received 88 488 complaints, of which 60 535 in the electronic document format [10]. Data from this section are the argument of citizens' confidence in the country's political system, of the active involvement of civil society in politics and the functioning of participatory democracy.

The research team of the University of Rochester (Paul Ferber, Frantz Foltz, Rudy Pugliese) indicated in the list of main interactivity indicators of political websites the following elements:

- active e-mail address of the political actor (or online form) allowing the establishment of one-way communication with high level of receiver control,

- active e-mail address, online form or contact details of the technical staff - an indicator of the unidirectional flow of information and the low level of receiver control,

- e-subscriptions, which allow the two-way communication, with a low receiver control,

- site search engine, considered an element that favors the two-way communication with low level of receiver control,

- virtual tours and interactive educational materials - are 2 other indicators of two-way communication with low level of receiver control. In the case of presidential communication, the virtual tours reinforce the political actor attribution ads official representative of the State who is authorized to promote the country's image, while educational materials contribute to the formation of the political culture of the citizens, understanding the role of civil society for the development of a democratic state, strengthening civic responsibility,

- personal websites, through which it is possible the bidirectional communication between politicians and citizens with high level of receiver control,

- online opinion polls – elements of three-way communication, with low level of receiver control,

- public forums – items of three-way communication, with high level of receiver control [1].

Considering these interactivity indicators of political websites, we note the presence of links to the pages of Facebook, YouTube and Twitter of the Ex-President of the Republic of Moldova and we appreciate the effort of the political leader to speak directly with young people and to provide them with the possibility of free expression by posting comments (likes) or to express interest for the problems of political and economic system of the country. Thus, young people from Moldova, thanks to these interactive forms of new media and their ability to become actors of presidential communication (acting as receivers of the political message forwarded through the new channel - the Internet), are an active part of the establishment and development of participatory democracy. They have access to political information and the freedom to express "their agreement or disagreement regarding the political positions of the President" [3, p.333].

3. Conclusion

The investigation of official website of Mr. Klaus Iohannis, the President of Romania, as well as the analysis, on the same indicators of interactivity, of the official website of Mr. Vladimir Putin, the President of Russian Federation, allowed us to observe the endowment of these means of online communication with several technical options that favor the creation of public deliberation and democratic dialogue between the Head of State and citizens. Based on these technological features and in order to optimize the presidential communication in Republic of Moldova we propose the following recommendations:

1. to create and to use the interactive element *Send a message to the President,*

2. the endowment of official website of the President of the Republic of Moldova with some interactive elements which would favor the development of two-way communication and which will contribute to promoting a positive image of the country and to strengthen citizens' political culture. We are referring in this case to the development, on the example the official website of the President of Russia, of a virtual tour or interactive educational materials,

3. to equip the official website of the President of the Republic of Moldova with interactive communication options, due to which the country's citizens could submit reclamations or complaints of corruption (on the model of the online communication platform http://kremlin.ru),

4. to create a personal website of the President of the Republic of Moldova (on the example of websites http://putin.kremlin.ru/ and http://www.iohannispresedinte.ro/).

It will improve the communication between the Head of State and citizens by the element *the personalization of political communication.*

The practical application of these recommendations will help improve the technical dimension of communication and the effective use of digital arsenal of presidential communication will contribute to revitalize and "to renovate the political life" [2, p. 130].

4. References

[1] FERBER, P., FOLTZ, Fr. and PUGLIESE, R.: Cyberdemocracy and Online Politics: A New Model of Interactivity. In: Bulletin of Science, Technology & Society, No. 5, 2007.

[2] HEINDERYCKS, F. : Obama 2008: l'inflexion numérique. In: Stegner Th. Le Marketig politique. Paris: CNRS Editions, 2012.

[3] MCKAY, A., PALETZ, D.: The Presidency and the Media. In: Handbook of political communication research. Mahwah, New Jersey: Lawrence Erlbaum Associated, 2004.

[4] MOUCHON, J. : La communication présidentielle en quête de modèle. In: Hermes: INIST-CNRS, No. 17-18, 1995.

[5] PASTOUREAU, M.: Albastru: istoria unei culori. Chișinău: Cartier, 2006.

[6] SINESCU, C.: Comunicare politică. București: Editura Universitară, 2011.

[7] http://www.presedinte.md/ - official website of the President of the Republic of Moldova

[8] http://www.presidency.ro/ - official website of the President of Romania

[9] http://www.iohannispresedinte.ro/ - personal website of the President of Romania

[10] http://kremlin.ru/ - official website of the President of Russian Federation

[11] http://putin.kremlin.ru/ - personal website of the President of Russian Federation

E-GOVERNMENT SERVICES IN ROMANIAN CITIES: A LOOK FROM THE INSIDE

Nicolae Urs[1]

Abstract
How good the e-government services of local governments are is usually ascertained through their success in attracting users. This paper looks at the other part of the equation. Our research aims to find out how successful the implementation of e-government services in Romanian local government is in the eyes of those tasked with rolling out these services.

As such, we surveyed heads of IT departments in the largest city halls in Romania (the county seats and the capital, Bucharest) to see how their IT professionals implemented e-government services and what their opinion was on E-government progress at a national level. We found that eService development was not a priority for Romanian city halls and that, with one exception, e-government did not appear prominently in their strategic development plans.

Key words*: e-government, local government, public servants view, Romania.*

1. Introduction

Researchers generally agree that e-government is becoming more and more important in facilitating interactions between the citizens and companies, on the one hand, and public institutions, on the other. But the gamut of opinion on the success of this implementation varies widely, from sceptics that say that e-government failed [14], to researchers that see a more incremental development of eServices, to optimists that talk about the imminent transformation of public administration by the forces of technology [9].

For those interested in the subject, there are various studies on the effects of e-government solutions or on the evaluation of technologies involved in implementing them. Usually, these studies focus on the e-government development stage [10], because it is easier and more straightforward to evaluate. And there is something inherently appealing about rankings: we seem to crave to see who is first, who is last and what are the causes for this, in a neatly packed chart.

Another type of e-government studies deals with user satisfaction with the online services offerings, both at local and at central levels. This kind of research is less prevalent, but it is nonetheless essential, because not involving the final beneficiaries can lead to poor design and low adoption rate, which can have a subversive effect, reinforcing the views of those that view e-government as just a fad or a resource hog. [3, 4 and 16].

The actors involved in e-government are usually thought of as public institutions, on the one hand, and citizens or companies, on the other. The problem with this interpretation is that we fail to take into consideration that those that design, implement, run, troubleshoot and expand those online

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services are also people: the IT specialists of public institutions. Their view on e-government development, with a few exceptions [1] is largely missing from the body of studies on this subject.

Related studies show that the competence of public servants directly affects the public administration performance [5]. Without a well-trained working force, even the best laid e-government strategies often go awry. Regarding the attitudes of citizens and public servants about e-government implementation (pace, advantages and disadvantages, risks and rewards), some researchers suggested that they did not coincide [11]. Moreover, they stated that there were deep variances between different parts of the public (those who regularly use the internet, those who have interacted with the government online, those who were more technologically averse, etc.) or between different segments of the public employees (those in management positions, IT specialists, those who worked with e-government services, etc.). Moreover, studies show that IT specialists in Public Administration can decide or influence the direction in which e-government development is heading in their institution [13].

Romania has little academic literature on the topic of e-government to begin with, and we could find no studies that took the public servants directly involved in e-government operation into consideration. Our research represents a starting point in this direction.

From our experience, the IT departments in Romanian public institutions are under-dimensioned and understaffed. Keeping up with technology advancements, devising and implementing a long-term e-government strategy, allocating sufficient resources (personnel, money, time, authority) does not usually seem to be one of the priorities of central or local public institutions. Again, from our involvement in projects with local public administration from all over Romania, big cities face different problems than small ones (in big cities public institutions find it very hard to recruit and keep good people in the face of private competition, mainly because the pay is much lower in the public sector; in small cities, there is lack of people with specialized knowledge, who usually move to bigger cities, where there are higher chances of finding a good job) but the end result is the same: difficulties in filling even the small number of posts that Romanian public institutions allocate for IT departments.

We began this study trying to prove or disprove a series of hypotheses:

1. Romanian public institutions (in our case, City Halls) experience difficulties in filling IT positions;

2. Management support and internal reorganization of the institution are seen by the IT professionals as very important in e-government development;

3. The main obstacles in e-government development are lack of interinstitutional interoperability and the differences between pay in private versus public organizations;

4. City Halls face slow citizen adoption of existing online services.

We started with 48 municipalities in Romania (the county seats City Halls, plus the Bucharest General City Hall and those of the six sectors of our capital city). We tried to talk on the phone with the head of the IT department in each City Hall about their responsibilities, resources, and grievances, and asked them to fill out an online questionnaire (this was followed in some cases by

further phone calls, to clarify some answers). With this tool, we tried to find out a number of things, such as:

- How well staffed their department was;
- What their evaluation of the e-government development stage was, both at a national level, and in their city;
- What the online services offered to citizens or companies were and what their uptake level was;
- What the main obstacles or drivers of e-government development in their city were.

In the end, we got 3 flat-out refusals (Bistrița, Constanța, Timișoara; they motivated these refusals by saying that their workload did now allow them the time). We could not talk with 8 heads of IT departments, for a number of reasons (their websites were down or we could not find them – Călărași and Buftea, some public servants were on sick-leave, some did not answer the phone; there were cases where we could not get a hold of anyone from the City Hall and the website did not mention any direct phone number).

We were left with 37 promises to fill out our online survey. In the end we got 21 usable answers (a completion rate of 56.7%). From this relatively low number of responses, we cannot propose general conclusions on the views of IT professionals in the Romanian local government, but we can start to see some patterns which will be verified in subsequent studies.

Drawing from some of our previous research [15], we also wanted to find out if IT department heads from City Halls which scored higher in our evaluation of e-government offerings differed in their thinking from those from cities that were placed lower on our ranking.

2. Results

The 21 cities from which we received responses are Bucharest Sector 6 (population 367,760), Bucharest Sector 2 (345,370), Cluj-Napoca (324.600), Brașov (253,200), Bucharest Sector 1 (225,400), Ploiești (209,945), Pitești (155,383), Bacău (144,307), Tîrgu Mureș (134,290), Baia Mare (123,700), Buzău (115,500), Satu Mare (102,400), Râmnicu Vâlcea (98,776), Drobeta Turnu Severin (92,600), Focșani (79,300), Tulcea (73,707), Reșița (73,282), Alba Iulia (63,500), Deva (61,123), Zalău (56,200), Slobozia (45,891). For Romania, and thinking of our focus on county seats, we have large, medium, and small cities in our dataset.

Most of our respondents were male (57 percent) and, surprisingly for this domain, most of them were over 40 years of age (in fact we had only four respondents under 40 years of age). This can probably be explained by the difficulties City Halls in Romania have in attracting and retaining young IT specialists. Most of them (55 percent) did not work in a private IT company before coming to a public institution. Half of them use internet banking or buy online once a week or more often. 25% of them use the internet for conducting banking operations or for purchasing from online stores less than once a month.

A small majority (62%) consider e-government development urgent or very urgent for their institution. They also have a better opinion of their City Hall online services offering: only 2 of them rated their city development level lower than the national level.

All cities offer the opportunity for citizens to pay their taxes online. Some other services offered online were complaints and requests (81%) payment of fines (67%), and asking for public interest information (57%).

We wanted to know whether the city hall had any data on their intended customers; we asked if there were surveys or any other information about internet use in general and the profile of the internet user in their cities, or on their needs and expectations. We got only one response to this question (Bucharest Sector 2 has studies that show that 86% of its residents use the internet). This fact makes us think that, at least for the cities in question, online service development is strictly a top-down approach, where the management and the IT specialists inside the public institution decide what the e-government strategy is, with either minimal consultation of citizens or none at all. This is evident from the questionnaire responses also, where lack of public pressure scored low on the list of e-government development obstacles. Moreover, aside from Cluj-Napoca and, partially, Deva (which has a list of ITC objectives without explaining how they will be reached), no City Hall has, as part of its Development Strategy, a plan for coping with technological changes, a roadmap for implementing e-government solutions and an understanding of what this implies (full disclosure: the author of this study was one of the coordinators of the IT and E-government chapter of the Cluj-Napoca 2014-2020 Development Strategy); on the Tîrgu Mureş City Hall site we found links to Digital Mureş, some kind of ITC strategy, but we could not find any documents or news about this project. In most cases, e-government is not even mentioned, and when it appears, it is brought up in passing only, as a theoretical objective, without a clear plan, resource allocation or apparent comprehension of the changes involved.

Two of the hypotheses we started with were confirmed by the responses we gathered. For the other two, the results were more nuanced than a simple yes or no.

First hypothesis: *Romanian public institutions (in our case, City Halls) experience difficulties in filling IT positions.*

This was confirmed by the results of the questionnaire. 90% of respondents said that having good professionals in the IT department was either important or very important for creating and implementing online services. Only 28% of City Halls were able to fill the available positions assigned to their IT department (also a small number to begin with). 75% opined that lack of trained employees was either a big or very big obstacle in e-government development, while 75% said the same about the difficulties of offering an attractive pay package to good specialists. This was seen as an important problem, especially in big cities, where private companies are also looking to hire IT specialists, often as soon as they graduate. The monthly pay for an entry-level position in a private company located in a large Romanian city starts at 500-600 euros (with added benefits such as private health insurance and trainings on a variety of topics). In public institutions, the monthly pay starts at around 300 euro, and there are considerably fewer opportunities to earn promotions. In smaller cities, this competition for IT professionals with the private companies is not felt that acutely, but almost all respondents considered this a big or very big obstacle in their institution's e-government development. Romanian academics (such as Dan Ioan Tufiş, an academician) have repeatedly said that to cover the needs of the IT sector, many more IT professionals were needed

(the deficit is around 15.000-20.000 people, by most accounts, and growing, especially because big international companies still see Romania as an attractive place to relocate part of their business).

The next table shows the scores assigned by the respondents to the importance of the hurdles they encountered in developing online services for their institution (the scores are from 1 to 5, one being the smallest obstacle). The most important impediments are the difficulty in keeping up with private sector offers in pay and other benefits, lack of adequate financial resources for their plans, shortage of qualified personnel, and lackluster support from the management.

	1	2	3	4	5	Average score
Difficulty in competing on pay with private companies	1	0	4	6	9	4.10
Lack of financial resources	1	0	5	7	7	3.95
Shortage of trained personnel	1	1	3	11	4	3.80
Absence of management support	2	0	7	4	7	3.70
Lack of interinstitutional interoperability	0	3	8	4	5	3.55
Lagging internal IT infrastructure	1	2	8	6	3	3.40
Lack of openness and transparency	2	4	4	6	4	3.30
Obsolete internal structure of the city hall	2	2	7	5	3	3.26
Outdated internal procedures	1	3	7	8	1	3.25
Lack of public pressure	2	6	4	6	2	3.00
Lack of immediate results	3	2	9	4	2	3.00
Slow internet connections	7	3	5	3	2	2.50

Table 1: The most important obstacles in implementing online services in Romanian public institutions

The second hypothesis we had was: *Management support and internal reorganization of the institution are seen by the IT professionals as very important in e-government development.*

To our surprise, the two items related to this subject in our question about the obstacles in implementing e-government (obsolete internal structure of the city hall, and outdated internal procedures) were in the bottom half of the results (with scores of 3.26 and 3.25, respectively). This can also be linked to the fact that the internal reorganization of the city hall was the last in the ranking of beneficial factors influencing the development of online services (2.95), while rethinking internal processes scored a little better (ninth out of twelve, with a score of 3.71).

This result can probably be explained by the fact that city halls in Romania have not undertaken radical reorganizations in the face of technological change. The IT departments in Romanian public institutions are usually on the bottom rungs of the organizational tree, lacking authority and resources to push for such a transformation. No city hall we studied has a position equivalent to a CIO (Chief Information Officer), and they are usually just a small bureau, part of a larger department. Our experience with public institutions tell us that the management usually sees IT specialists as the people that fix computers, clear out jammed printers and install Skype, rather than professionals who should devise digital strategies and implement e-government applications. As such, there is little surprise that support from management was the top scorer on the list of valuable influences for the success of the city hall online presence (4.48).

	1	2	3	4	5	Average score
Management support	0	0	3	5	13	4.48
Sufficient ITC equipment	0	0	1	9	10	4.45
Sufficient financial resources	0	0	1	9	10	4.45
Good relationships with ITC and digital solutions providers	0	1	2	9	9	4.24
Well-trained people in the IT department	1	0	1	10	8	4.20
Legal constraints	0	0	3	10	7	4.20
Citizen's increasing usage of private online services	0	1	3	11	6	4.05
Obtaining visible results fast	0	2	3	11	4	3.85
Rethinking internal processes	0	2	6	9	4	3.71
Ties with other public institutions	0	3	5	10	3	3.62
Pressure from the public	0	3	5	11	2	3.57
Internal reorganization of the city hall	3	4	6	7	1	2.95

Table 2: The most important beneficial factors helping online services implementation

With very few exceptions, city halls in Romania are still stuck in the bureaucratic or, at best, in the New Public Management paradigm of doing business. A combination of lack of resources (people, money, and authority), almost nonexistent interoperability, and deficiencies in internal digitalization led to a lag in conceptualizing and internalizing new organizational models, that put a bigger emphasis on the effects of technology progress and the changes it brings – for example, the DEG (Digital-Era Governance) theory proposed by Dunleavy et al. [6]. Without this theoretical foundation, it is hard to envision rapid change in digital governance in Romanian cities (which should include internal reorganizations, digital-first processes, boosting IT spending, and fighting for the best IT specialists) for the foreseeable future.

Our third hypothesis – *the main obstacles in e-government development are lack of interinstitutional interoperability and the differences between pay in private versus public organizations* – was also partially disproved.

True, especially in big cities, the difference in pay and other perks between what the public institutions can offer and what the private companies are prepared to put on the table in the race to hire the best IT specialists is the biggest hurdle our respondents identified. But the second item we looked upon (deficiencies in information sharing between public institutions) did not score as high as we would have expected (3.55).

A lot of interactions between companies and citizens, on one hand, and the state, on the other, involve more than one institution. Without robust interinstitutional data links and procedures, these services are not suitable to be moved entirely online (it is infamous and also something of a joke in Romania that the city hall usually asks for a copy of your ID for any interaction with citizens, even though the Local Register Office is part of the Local Council, which is itself part of the city hall).

It is telling that the only institution with which more than 1 city hall has agreements of data exchange (the way this exchange is made, the types of data shared, the ways in which discrepancies are resolved, etc. could be the subject of another research) is the National Agency for Fiscal Administration (NAFA) – 33% of respondents said that their institution had some kind of data sharing with NAFA. Other than that, no other public or private organization was mentioned more than once, and most cities have no such sharing agreements at all. This deficiency is all the more

glaring if we remember that the city halls comprised in the study are some of the biggest in Romania. It is true that a lot of other countries face problems when it comes to linking together IT systems that were not envisioned to talk to each other [8]. Small advances in this field are starting to appear, but usually the approach is top-down, from the central government, through legislative instruments and coercion.

Another element evident from our data is that there is very little public pressure to introduce more and better public eServices. As you can see from the charts above, lack of public pressure was third from the bottom on the list of obstacles in developing e-government services (in other words, the respondents did not consider this important). This is also apparent from the list of beneficial influences for their work, where the same public clamoring for progress in this field ranked second to last.

More collaboration between institutions in information exchange, database linking and designing seamless services across both internal departments and public institutions is fraught by multiple problems, both local and national. An universal e-ID of some sorts is very problematic to introduce, for a number of reasons (socio-cultural – a lot of Romanians protest this on religious reasons, historical – most Romanians still remember communist times, when state surveillance was used not to provide better services, but for other, less desirable, reasons entirely, technical – most IT systems were not created with interconnectivity in mind, financial – e-government was never a priority to the Government, irrespective of bombastic announcements, security – citizens are more and more aware of the possibility of data breaches, with a number of those featured prominently in mass-media). Without this underpinning, unified eServices are much harder to implement (success stories such as Estonia are partially based on effective universal electronic identification).

Our forth hypothesis was that *City Halls face slow citizen adoption of existing online services*.
This was largely confirmed, with the caveat that we have little data to support a generalization, for a number of reasons.

First of all, only 12 out of the 21 respondents specified any hard numbers for the usage of online services. Secondly, in the case of one of the most important and wildly used (relatively speaking) service – Online tax payments – some citizens could have used a central government site, ghiseul.ro, which provides such services for any enrolled municipality (all city halls in our study were registered). Our efforts to obtain these data from the site administrators failed until now (if we can get a hold of the information, we will update the article at that time).

Generally, the adoption figures were low. Even if all city halls offer the possibility for online tax payments, the numbers were at most in the thousands, (Bucharest Sector 2 was topped the chart with 9021 citizens paying online, followed by Sector 1 (6560) and Cluj-Napoca (5297).

If we take into account the city population, Baia Mare emerges victorious, with a little over 4% of citizen paying their taxes online in the first 11 months of 2016. For fine payments, Bucharest Sector 1 takes the first place, followed closely by Baia Mare. For the other categories we had too few data for a meaningful comparison.

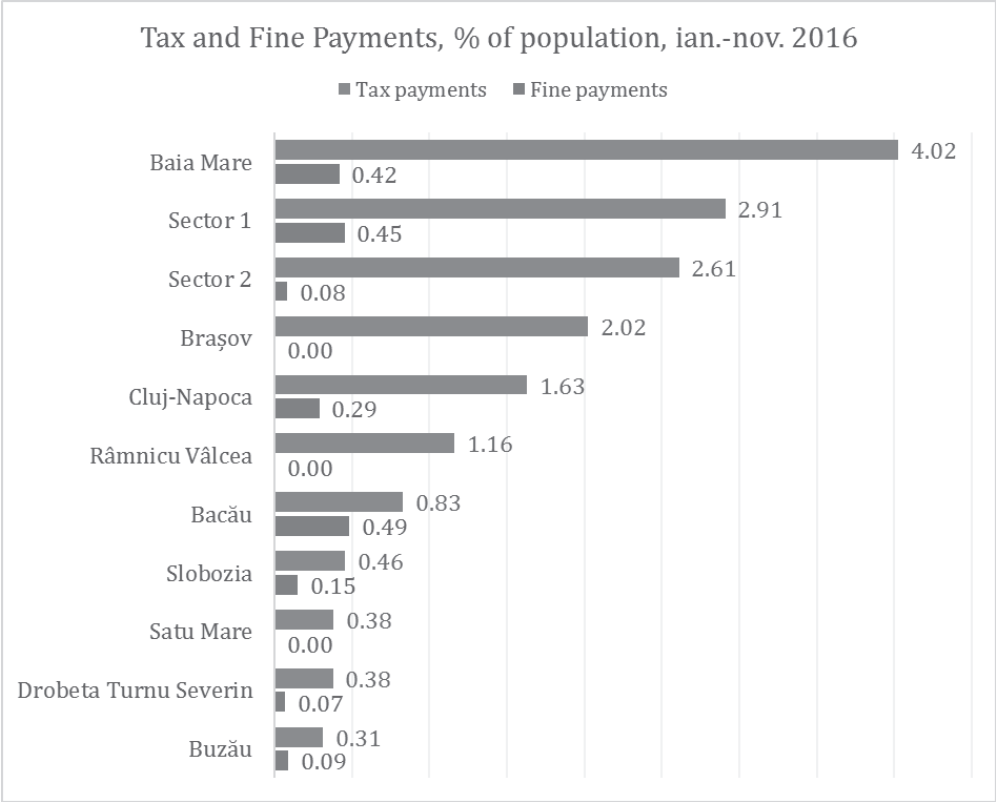

Table 3. Percentage of people using online payment of taxes or fines

It is hard to compare these findings with data from other countries, due to the paucity of studies regarding local tax payments through the internet. We consider these figures as proof of low uptake rates in Romanian cities because no city hall can present a rate of 5% or more of tax fillings done online and because the instruments to pay online are easy to use and understand (a lot of Romanians pay online or conduct banking operations online; a 2015 study by iSense Solutions showed that 53% of Romanians living in cities have bought goods or services online, paying with debit or credit cards). Another reason is that these instruments have been available for some years, especially on big cities websites.

One reason for the low adoption rate can be insufficient public knowledge about the possibility to pay your taxes or fines online. Due to the low priority given to e-government in general by Romanian city halls, it comes as no surprise that advertising these eServices is typically confined to an announcement or a banner on official websites, while citizens do not routinely interact with public authorities online – according to Eurostat, only 9% of Romanians do [7].

Another reason could be the relatively low level of trust Romanians have in public institutions. A study of INSCOP [2] shows that 37.3% of citizens trust their city hall (for comparison, the Parliament enjoys the trust of 12.6% of respondents, while the presidency tops the ranking, with 45.2%).

3. Other findings

The first signs of collaboration between public and private institutions in the field of e-government are beginning to appear. In Braşov, for example, the city hall and public utilities and telecom companies (among these, some are public and some are private) are starting to exchange geospatial data, to better coordinate their interventions and network expansions.

One of our curiosities was finding out if those respondents with work experience in private IT companies saw e-government development somewhat differently than those without. 45% of the IT specialists in our study had previous private work experience, and they tended to view the state of national e-government development more critically (an average score of 2.56, on a 1-5 scale, where 5 was the biggest score). Those that had only public sector experiences gave an average score of 2.86 to Romanian e-government efforts. Regarding their opinion on their own public institution e-government progress, the scores were equal, both categories settling for a middle-of-the-road 3. Another interest was seeing how the scores of our previous research (evaluating the online offerings of the Romanian County Seats) correlated with the IT managers' own perception about how well their city hall was doing on the e-services front.

	E-government score	City Hall e-gov development auto evaluation (1-5)
Alba Iulia	68.61	4
Baia Mare	60.95	4
Satu Mare	59.35	3
Sector 6	55.89	2
Tîrgu Mureş	53.35	4
Cluj-Napoca	50.99	2
Zalău	49.12	2
Deva	46.12	3
Piteşti	45.35	3
Braşov	44.96	4
Ploieşti	43.57	3
Focşani	41.40	3
Bacău	40.93	4
Sector 2	35.11	3
Râmnicu Vâlcea	34.16	3
Buzău	32.68	3
Drobeta Turnu Severin	32.42	2
Sector 1	31.65	2
Reşiţa	27.23	3
Tulcea	24.64	3
Slobozia	22.76	3

Table 4: Correlation between the auto-evaluation of e-gov development stage and the actual ranking

4. Limits of the study and further research

As mentioned previously, the number of respondents is relatively low. Another limit of the research is the limited insights gathered from the online questionnaire. Face-to-face interviews with at least some of the respondents could bring a more in-depth understanding of the IT professionals working in Romanian public institutions, and this will probably be the subject of one of my future studies.
The study could be enriched by data from other public institutions or organizations, as well as by information on public services intermediated by central government sites (ghiseul.ro is a case in point).

This type of research could be performed within a multinational comparative project, so as to understand differences and similarities between countries and gather best practices.

5. Conclusion

The main takeaway from this study is an understanding of the low priority e-government development has in the biggest city halls in Romania. From the small number of employees in IT departments, the little importance given to the IT units in general, the low number of online services offered and the disappointing uptake from the citizens, to the lack of visible strategies for eServices, all elements point to haphazard and uncoordinated efforts to digitalize Romanian public institutions. IT professionals are by and large aware of the problems, if, on average, a little behind in keeping up with the latest theoretical developments. Without more resources invested in all facets of e-government (new technology, more people, better training, better collaboration with private stakeholders, and more authority to shake things up inside the institutions), the road towards more and better online services will be slow and arduous, with many detours and walk backs. All-in-all, in the face of so many obstacles, we think that the IT specialists in Romanian city halls are doing a better job than we expected.

6. References

[1] BALDWIN, J. N., GAULD, R., and GOLDFINCH, S.: What Public Servants Really Think of E-Government. Public Management Review, 14(1), 2012, p.105-127.

[2] Barometrul INSCOP – Adevărul despre România, March 2016. (2017, January 5). Retrieved from INSCOP: http://www.inscop.ro/aprilie-2016-increderea-in-institutii.

[3] BOVENS, M., and ZOURIDIS, S.: From street-level to system-level bureaucracies: How information and communication technology is transforming administrative discretion and constitutional control. Public Administration Review, 62 (2), 2002, p.174–84.

[4] CHAN, F. K. Y., THONG, J. Y. L., VENKATESH, V., BROWN, S. A., HU, P. J., and TAM, K. Y.: Modeling citizen satisfaction with mandatory adoption of an e-government technology. Journal of the Association for Information Systems, 11(10), 2010, p.519–549.

[5] CHUNG, H. Y., LEE, G. G., and KUO, R. Z.: Determinants of Public Servants' Intention to Adopt E-Government Learning. Review of Public Personnel Administration, 36(4), 2015, p.396-411.

[6] DUNLEAVY, P., MARGETTS, H., BASTOW, S., and TINKLER, J.: New Public Management Is Dead—Long Live Digital-Era Governance, Journal of Public Administration Research and Theory, 16, 2005, p.467-494.

[7] Eurostat. (2017, January 5). E-government statistics, 2016. Retrieved from Eurostat: http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&pcode=tin00012&plugin=1.

[8] GATAUTIS, R, KULVIETIS, G, and VITKAUSKAITE, E,: Lithuanian eGovernment Interoperability Model. Inzinerine Ekonomika-Engineering Economics, 2, 2009, p.38-48.

[9] HAZLETT, S.-A., and HILL, F.: E-government: The realities of using IT to transform the public sector. Managing Service Quality, 13(6), 2003, p.445–452.

[10] HOLZER, M., ZHENG, Y., MANOHARAN, A., and SHARK, A.: Digital Governance in Municipalities Worldwide. Newark, New Jersey: E-Governance Institute, National Center for Public Performance, Rutgers University, 2014.

[11] MOON, M. J. and WELCH, E. W.: Same Bed, Different Dreams? A Comparative Analysis of Citizen and Bureaucrat Perspectives on E-Government. Review of Public Personnel Administration, 25(3), 2005, p.243-264.

[12] NORRIS, D. F., and REDDICK, C. G.: Local E-Government in the United States: Transformation or Incremental Change? Public Administration Review, 2013, p.165-175.

[13] ROSE, J., PERSSON, J. S., and HEEAGER, J. T.: How e-Government managers prioritise rival value positions: The efficiency imperative. Information Polity, 20, 2015, p.35-59.

[14] ŞANDOR, S. D.: ICT and Public Administration. Transylvanian Review of Administrative Sciences, 2012, p.155-164.

[15] URS, N.: Online Services and Social Media Use in Romanian Cities: Can We See a Pattern? 24th NISPAcee Annual Conference, Spreading Standards, Building Capacities: European Administrative Space in Progress, NISPAcee Press, 2016, p.1-17.

[16] WELCH, E. W., HINNANT, C. C., and MOON, M. J.: Linking citizen satisfaction with e-government and trust in government. Journal of Public Administration Research and Theory, 15(3), 2005, p.371–391.

eDemocracy II

VOTING ADVICE APPLICATIONS IN HUNGARY. VOKSKABIN IN THE MULTI-ELECTION YEAR 2014 AND BEYOND

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Abstract
The objective of the paper is to introduce the first Hungarian scientifically developed online voting advice application project Vokskabin (www.vokskabin.hu). It was established on the occasion of the Hungarian super election year 2014, when three elections - parliamentary, the European Parliament and the municipal elections – took place. As a first step the study describes the development phase of the project as well as its structure and purpose. Furthermore, it analyses the user-statistics of the answered questionnaires, generated by the online-tool, for all three Hungarian elections and for the two questionnaires "Equality of men and women in Hungary" and "Roma in Hungary" which were developed 2015 to keep the civic education aspect of Vokskabin alive and addressing politically and socially relevant issues like gender equality and minority situation, also outside the election period.

The paper raises two main questions: 1. Are there any regional differences of Vokskabin users' behavior? 2. How does Vokskabin influence the voting behavior (with focus on the electoral participation) and the political knowledge? This part of the study is based on survey questionnaires addressed to the users of Vokskabin.

In addition to the analysis of the statistics the paper aims to highlight the role of voting advice applications in general and the role of Vokskabin in particular, as means of civic education in the 21st century Hungarian society.

1. Voting Advice Applications (VAAs)

One of the main achievements of political and social development in modern Europe lies in the improvement of the decision-making process which is now open not only to the members of limited groups privileged by birth (emperors, kings, consultants, aristocrats) but also to those concerned. The idea of social equality became the breeding ground for innumerable ideas and movements across the world (African-American civil rights movement, suffragettes) who fought for the largest possible degree of self-determination and responsibility for their own lives: for the right to vote.

While there are still places where the fight for general, equal, free and secret elections is ongoing, in the modern knowledge-based societies of the 21st century it is not our right to vote but rather our ability to make an informed decision which is becoming uncertain to an ever-increasing degree. This right and ability, in addition to compliance with census rules and the drawing up of constituency boundaries, has the potential to exert the most influence on what political forces, parties or interest groups we elect into (legislative) power. It is therefore absolutely essential for us,

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the electorate, to familiarise ourselves with the party manifestos and to pay attention to both the social issues that concern us and to the solutions that the parties propose for such issues.

1.1 International Examples

In Europe, this thinking formed the basis for an initiative that was first implemented in the Netherlands, followed by Germany and Austria that uses easily accessible electronic tools to help people make their voting decisions in a simple but interactive way. The first voting guide was compiled by the Instituut Publiek en Politiek in the Netherlands in 1989. Initially it was paper-based but in 1998 it was put online. In 2002 Germany obtained the relevant licence and used the so-called Wahl-O-Mat for the first time at the general elections for the German parliament (Bundestagswahl).[4]

The Wahl-O-Mat has since become one of the most successful achievements of the Bundeszentrale für Politische Bildung.[5] Initially presented to political parties for completion, the questions on popular issues have been and still are being compiled by an independent group of researchers and young students at Heinrich Heine University.[13] The research team selected the final tests from questions where different answers were given by the political parties, i.e. where differences clearly showed in their views on social issues, politics or economics.

2009 saw great changes in the political voter guides in Germany since not just the political parties holding seats in the German parliament were entitled to share their views via the Wahl-O-Mat but also the parties registered for any elections, an approach that was adopted by the Hungarian Vokskabin application. The application was implemented in several German states in time for the state elections.[5] In Austria the Federal Ministry of Education, Arts and Culture [Bundesministerium für Unterricht, Kunst und Kultur] and the Donau-Universität Krems took upon themselves the task of initiating the creation of a publicly accessible VAA. In the context of the "Politikkabine" application, the main department for political communications [Department für Politische Kommunikation] at Donau-Universität is responsible for coordinating the journalists, statisticians and political scientists involved in the initiative. Compiled by the above department, the tests on popular issues which contain 20 to 25 questions provided a voting aid for the electorate preceding the Austrian elections.[7] The Politikkabine application was discontinued in 2014. The other popular VAA in Austria is Wahlkabine[27], which began in 2002, just like Wahl-O-Mat. As in Germany, the two Austrian VAAs aim to provide information to the Austrian people and present political content (election campaigns and party manifestos, policies and plans) to those interested. Similar to the method applied in Germany, the political parties and candidates are first required to respond to questions relating to social politics. Then the application compares their answers to the opinions of the voters who completed the test.

Similar initiatives were started in Anglo-Saxon countries, which, apart from certain variations in methodology, also focus on providing guidance to the electorate. In 2012 Taylor Peck and Nick Boutelier undertook the seemingly insurmountable task of constantly monitoring economic matters, domestic affairs and foreign policy in the USA, the UK, Australia, Canada and India, to establish the political views of those surveyed in these countries by means of tests similar to those previously mentioned. Nevertheless their methods differ fundamentally from the online VAA systems deployed in continental Europe as in their case, the political parties do not receive any tests or questions and the replies to the questions are inferred from communications in press conferences, party manifestos and interviews.[18]

2. Creation of the Hungarian VAA, Vokskabin

In Hungary the need for and thinking about the creation of a voting guide application emerged prior to the start of the Vokskabin project. Political analyses, research studies and statistics have been available in Hungary in the past and numerous research institutes dealt with the run-up to the elections, the presentation of political manifestos and their analyses. These include, inter alia, the Political Capital Policy Research & Consulting Institute, established in 2001, which focuses on analysis and consulting activities in Hungary[22], Iránytű Politikai és Gazdaságkutató Intézet [Compass Institute for Politics and Economic Research], established in 2011, which likewise strives to contribute to the development of the political and economic culture of the country in an unambiguous manner[20] for the Institute of Word Economics of the Hungarian Academy of Sciences [Magyar Tudományos Akadémia Világgazdasági Intézete], which deals with the impact that economic processes taking place on a global and EU level have for Hungary. Based on in-depth research work, it is precisely due to their level of detail and analytical character that these analyses failed and still fail to evolve into informative guides giving direction to large social groups.

This was the reason why in 2006 the idea was born to create an interactive VAA which initially came into being as Választási Iránytű [Vote Compass] for the 2010 general elections. The questions asked by Vote Compass were compiled by the market research institute Ipsos and the international Association for European Election Officials (ACEEEO). Based on this, six years ago voters received guidance in the form of tests containing 48 questions, to help them judge their political affiliation in a more confident manner.[1]

Started in the multi-election year 2014, Vokskabin was initially composed of a team of political scientists, historians and students who also primarily followed the German and Austrian examples, thereby creating a VAA based on international collaboration with the specific feature that one of its supported languages is German, so those interested in Hungary who live in German-speaking areas can stay abreast with what is going on. In contrast to the US term *Voting Advice Application*, which implies the provision of voting advice, Vokskabin distances itself from this interpretation and defines itself as a scientific, *non-partisan online voting advice application* (abbreviated: VAA) with the primary objective of *providing guidance in the most important popular issues* and helping users decide on the positions of the surveyed parties and their own opinions, particularly in election periods.

2.1 Methodology of Vokskabin

Those who complete the Vokskabin questionnaire get the chance to learn which political party and/or parties stand closest to or farthest from their own preferences. Via the Vokskabin online interface, visitors have the chance to respond to a set of 25 to 35 questions that change from time to time and are relevant in everyday life. The Vokskabin methodology follows the approach of the Austrian partner project *POLITIKKABINE.AT*. Importantly, this Austrian application does not record personal data, so as to ensure user anonymity. Based on the answers yes/no or "I don't know" the user learns the degree of identification with or divergence from the views of the political parties, which is shown as a percentage ranking in a graph once the set of questions has been completed. The match ratio is calculated by the application using the following equation: $Pi\ (f, p) = aif * aip$. Based on this, the following reply combinations are possible:

Political party User	"Yes"	"No"
"Yes"	1	-1
"No"	-1	1

Figure 1: Points of accordance without weighting
Source: Politikkabine.at 2012.

Different values are generated depending on the answer. When the answers of the political parties and of the user match, the value is 1 point, if they do not match, -1 point. The "I don't know" answers have no influence on the accordance or divergence value since the answer option "I don't know" is not accessible to political parties. When skipping a question, i.e. when a user does not choose any option for one or more questions, the application advises the user that the result will be calculated based on all the questions answered "yes" or "no".

As for the creators of the predecessors of Vokskabin, the primary objective was to lay down the basic principles and aims of the application. For Wahl-O-Mat, Politikkabine and Vokskabin, acting in good faith, impartiality and a non-partisan approach are indispensable. Consequently, based on the German example mentioned above all Hungarian political parties that registered for the 2014 general elections or for the European parliamentary elections were eligible to complete the questionnaire and attach brief explanations. Acting in good faith and *impartiality* are important first and foremost because the answers received from the political parties and the creation and analysis of the tests serve two purposes: to *provide information* and *political education* to the electorate in a playful form and to utilise the data collected in this manner for later research. Vokskabin's objectives include contributing to the *transparency* of Hungarian political life and providing information on the views of the political parties to the users. The main tool for achieving this is to strive for collaboration on a broad basis, and to this end political parties, the media, non-governmental organisations and students are involved in the process not only in evaluating the questions and completing the questionnaires but at the very first stage, i.e. when the questionnaires are being elaborated and edited. In addition to all of the above, Vokskabin's *most important* undisclosed *objective* is probably to *create openness in the young and first-time voters* for public issues and to have them make informed decisions at general elections, European parliamentary elections and local elections.

In 2014 several initiatives akin to Vokskabin were launched. These included, for example, the site partkereso.hu which was launched by Nézőpont Intézet. It failed to achieve its aim due to a lack of impartiality and user anonymity and the erroneous programming of the application's search engine. As a result Nézőpont discontinued the project and closed the web interface of this search site. At the same time, a positive example worth mentioning is a questionnaire created by VS.hu for the general elections and the European parliamentary elections that contained 50 questions and which was designed to help voters decide on a political party[2]. Similarly to VS.hu, for the general elections the non-profit organisation K-Monitor [K-Monitor Közhasznú Egyesület] launched the questionnaire "Voksmonitor" which contained 50 questions.[3] Voksmonitor was the only application launching a voting aid regarding the candidates for the election of Budapest mayor and it was the only voter guide that created a guidance questionnaire for the local elections on 12 October 2014.

[2] The site is no longer available.
[3] Available: http://voksmonitor.hu/2014-es-orszaggyulesi-valasztas/#p2

3. VAA impact studies

There is little Hungarian literature as yet on the presentation of VAAs, their impacts and their scientific aspects. Foreign scientific literature focuses specifically on examining the mechanism of action of VAAs, and Stefaan Walgrave distinguishes 4 areas[26]: firstly, the effect on the voters, secondly the effect on the political parties/candidates, thirdly the effect on the electoral campaign and fourthly the effect on science. In the voter impact study we present another 3 categories. In the first category we review the influence of online VAAs on the awareness of the users, on the manifestos of the political parties and/or candidates and on public issues with regard to the current political situation in general. In addition, we are able to work in one of the most important areas of research and study the impact of VAAs on voter turnout and decisions. This includes, for example, questions examining whether the impact of the VAA on voter turnout is positive or not or if VAAs have an influence on a potential change in the party and/or candidate affiliation of the user and if so, to what extent. This mechanism of action is documented in various research studies [12][2][25]. Naturally, relevant studies point out that VAAs can have an influence on the manifestos and campaigns of the political parties and candidates. It is not unusual in countries like Germany, the Netherlands, Austria or Switzerland, where online VAA applications can look back at decades of tradition and have tens of millions of users preceding a given election, that the political stakeholders consciously utilise VAAs for the marketing of their individual and their parties' manifestos.

The 1st Vokskabin impact study, a questionnaire named "Roma in Hungary", was published in December 2015. The users were asked questions in connection with voting mechanisms of actions, in particular the influence of Vokskabin on political knowledge, voter turnout and decisions. A total of 1,240 people participated in the survey held between 9 December 2015 and 4 January 2016. However, before presenting the results of the impact study it is worth considering the usage levels of Vokskabin.

3.1 Vokskabin usage level

Utilising the data at our disposal we can provide an overview of the number of people who in the period from 4 March 2014 (the time the site first went live) to 12 October 2014 (the time of the local elections) completed the Vokskabin questionnaire for the general elections, the European parliamentary elections and the local elections, and what pattern of regional distribution emerges (country, region, town or city) when considering the questionnaires completed separately for the general elections, the European parliamentary elections and the local elections, respectively. When referring to users we mean all visitors to the Vokskabin website who completed the questionnaire, either partly or in full, and arrived at the last page, i.e. the results page. Visitors to the site who did not start completing the questionnaire and merely browsed the site or who stopped completing it halfway through after having started were not included in the database. It is important to note that 15.6% of all users were returning users. However, this percentage figure does not allow us to define the regional distribution of the returning users. There is no facility in Google analytics to check single users and returning users separately. In this respect the regional distribution of the results may be distorted. Regarding the geographical features of the usage levels we examine both the Hungarian data and the more conspicuous foreign data. The data used in the research were provided by the software of Google analytics, which has been measuring the usage levels of the site and the regional distribution of the IP addresses since Vokskabin's launch on 4 March.

Vokskabin compiled a questionnaire drawing on the 4 most important subject areas of the general elections[4]. Following its launch on 4 March, the questionnaire with 26 questions was completed by 27,757 respondents in total. On 5 March the site recorded the highest number of users in one day (more than 9,000), when following a press conference on the day before, numerous online articles reported on the launch of the site. The media reporting on Vokskabin included, among others, origo.hu, index.hu, 444.hu and a considerable number of Hungarian and foreign websites and blogs. In addition to this, the Budapest-based Civil Rádió presented the project in an interview.[6] While visitor and usage levels were initially high, a daily average of almost 1,000 people completed the set of questions until 6 April, the day of the elections, thereby exceeding the expectations of the project initiators. Some 14.2% of the users visited the site and used the application several times. This indicates that the playfulness of the application caught the attention of many and encouraged them to "self-test".

3.1.1 Vokskabin foreign usage levels

One striking feature that emerges when examining the application's usage levels is the large number of foreign IP addresses that the application was used from for the general elections. The data processed for the examination were those collected by Google analytics in the period from 4 March 2014 to 12 April 2014. One of the reasons why the usage levels of foreign users are so considerably high lies in the fact that the website is bilingual and the questionnaires, supporting materials and background information are available not only in Hungarian but also in German. This way, the bilingual layout attracted native German speakers who have an interest in Hungarian politics. Due to the weak economic environment, many Hungarians have moved to another country in past years, which serves as a further explanation for the extensive participation from outside Hungary. The 3 most popular target countries for Hungarian migrants are the United Kingdom, Germany and Austria.[21] Their number, according to a KSH flash estimate, amounts to 335,000, which includes Hungarian citizens who have a Hungarian residential address or who support a Hungarian household. Even so, the ratio of migrants who do not belong in either of the two above groups is extremely high. As a result they are not included in any surveys.[17] Since the number of votes cast by citizens residing abroad is quantified precisely, we work with these figures as baseline data in the study. A total of 24,119 (85%) out of 28,161 Hungarian citizens who registered at the embassies cast their ballot. The most votes for the general elections were cast in London[14], where 5,371 voters registered to vote at an embassy or consulate and 4,435 of them actually cast their ballot on 6 April. Munich came 2nd with 2,580 embassy or consulate voters. In Brussels this number further decreased with 1,675 persons voting. 1,000 embassy or consulate voters were counted in Bern, Berlin and Vienna.[14]

Taking into account the voting behaviour of voters residing abroad, further examinations should be conducted on the completion of the Vokskabin general elections questionnaire by foreign users. The highest user activity outside Hungary was recorded in Austria, where 4.64% of all users, i.e. 1,287 people, used the application. Germany came 2nd with 929 respondents, i.e. 3.35% of all users. With a mere 371 completed questionnaires the United Kingdom came 3rd. The high activity levels in Austria become even more striking if we consider the populations of Austria (8.4 million), Germany (80.6 million) and the United Kingdom (64.1 million). Moreover, while London was by far the busiest embassy or consulate voting place for the general elections, it is interesting to note that the number of Vokskabin respondents was extraordinarily low here and accounted for a mere 1.34% of all users. This indicates that while the German version of the site was able to attract the non-

[4] Economy, democracy, political culture, domestic and foreign policy.

Hungarian speakers in Austria and Germany, this was not possible in English-speaking regions due to the lack of an English version. For this reason it can be assumed that the questionnaires submitted in the United Kingdom were completed by Hungarian- or maybe German-speaking users. With regard to the geographical distribution of the users from Germany it is worth mentioning that only 6% of almost 1,000 respondents were inhabitants in the area of the former GDR or resided there at the time of completing the questionnaire. A certain share of the number of Berlin respondents, who amounted to 10% of all users in Germany, is added to the number of users from the area of the former GDR. The highest numbers of users of the application were based in Bavaria, Baden-Württemberg and North-Rhine Westphalia. In Austria 1,287 respondents replied to the questions, so Hungary's neighbour ranks 2nd after Hungary on the list of countries where Vokskabin questionnaires were completed. Interestingly, in Vienna a mere 1,031 people voted at an embassy or consulate. By contrast, 953 people completed the Vokskabin general election questionnaire in the Austrian capital, which is 74% of all questionnaires completed in Austria.

Compared to the statistical data of the general election questionnaire, Vokskabin's foreign usage levels show a significant divergence regarding the European parliamentary elections in May and the local elections in October. Between 12 and 25 May 2014 the questionnaire, which likewise contained 26 questions, was completed by 825 people in total, 550 of them based in Hungary. In absolute terms, the highest number of completed questionnaires (73) was submitted in Germany, followed by Spain (45), Austria (34) and Greece (16). Ranked in relation to population, however, this list changes: Austria first, followed by Greece and then Spain. The low user numbers are also reflected in the limited interest shown in the European parliamentary elections. In Hungary the voter turnout for the European parliamentary elections was even below 29%, which falls significantly short of the EU average of 42.6% produced in 2014 (European elections, 2014: 40%). The low use of the Vokskabin questionnaire for the European parliamentary elections was influenced by two additional factors: firstly, in contrast to the election in April the Vokskabin questionnaire on the European parliamentary elections received no media coverage and it was only the Vokskabin Facebook[5] page that was able to draw a certain number of responses from users. The second influencing factor lies in the fact that numerous other similar voting guides started operating at European level at the time of the European parliamentary elections, all of which represented a significant source of competition to Vokskabin. In this respect, it is worth mentioning some projects such as EUvox 2014[6], where the Vokskabin editorial team and the students of Andrássy University [Andrássy Egyetem] contributed to compiling the Hungarian party profiles, and Europrofiler, which is also the result of international collaboration. [7]

The 3rd and last election in 2014 took place on 12 October. For this, Vokskabin's editorial team compiled a questionnaire with 39 questions which was launched at the press conference held on 1 October at Andrássy University. Consequently, the study refers to data collected between 1 and 12 October 2014. At the local elections, where the representatives of the local councils and the mayors were elected, the turnout of the electorate was 44.29%. This limited interest was reflected in the numbers of respondents to the Vokskabin local election questionnaire. During the surveyed period, in Hungary the local election questionnaire was completed by a mere 473 people, who, in contrast to previous figures, account for 61% of all completed questionnaires. The German figure of 185 users (23.9%) took second place, and in terms of the foreign figures first place, respectively. Austria came 2nd with 45 respondents and Switzerland 3rd with 14 users. Taking into account the number

[5] https://www.facebook.com/vokskabin.hu
[6] http://www.euvox2014.eu/
[7] http://www.euprofiler.eu/

of inhabitants of Austria and Germany, the holders of the first two places switch again. With regard to the German regions the local election questionnaire yet again reveals a *"West German" dominance*: The highest numbers of users of the application were recorded in North Rhine-Westphalia and Bavaria. In the area of the former GDR the ratio of users was 9.5% in total, a figure that, as previously, has to be supplemented by one part of the Berlin respondents (12%). In Austria the most users interested in the Vokskabin questionnaire for October were located in Vienna and in Graz.

3.1.2 Vokskabin usage levels in Hungarian towns and cities

As was the case with the European parliamentary elections, the little interest displayed in connection with the local election questionnaire was partly due to the fact it received no media coverage. The low turnout at the election is further testament to the fact that the interest of the electorate in the local elections had dropped significantly by October, which can be ascribed to the multi-election year having a demotivating effect on voters.

Vokskabin's sets of questions revealed an interesting pattern regarding the election turnout of Szentendre inhabitants. For a period of nearly 5 weeks during which the set of questions for the general elections was used, *Szentendre* was amongst *the most active* towns and cities. A total of 13,300 completed questionnaires means that the highest number of users is located in Budapest. However, when considering the number of users in relation to the size of the population, we get a different picture: 0.76% of all Budapest inhabitants completed the Vokskabin questionnaire. In Pest county, where Szentendre is located, a total of 2,247 persons replied to Vokskabin's questions that focused on the general elections. If we rank the most active towns and cities in relation to the number of their inhabitants, Vác takes 3rd place. In Vác we counted 234 users, a figure that corresponds to a turnout of 0.70% measured against the total number of Vac's inhabitants and which falls short of the Budapest figure only to a very small extent. The 2nd most active town was Budaörs, where Google analytics registered 237 users, a figure which corresponds to a turnout rate of 0.85%, putting it ahead of Vác and Budapest. In Vokskabin's mobilisation "race", Szentendre came first in the ranking: 242 users completing the general election questionnaire corresponds to 0.95% of the total number of Szentendre's inhabitants. Not only did the inhabitants of Szentendre show greater interest towards Vokskabin but also towards the general elections: On 6 April, participation in Szentendre was 69.26%[23] which is more than 8 percentage points above the national average (61.73%).[15] However low the figure of 11 European election questionnaires is in itself, it still means that Szentendre was once again the most active amongst Hungarian towns and cities. At the local elections, 276 out of a total of 473 respondents completed the questionnaire from a Budapest IP address. Defining any significant geographical features of the remaining users is not possible since the remaining 197 questionnaires were completed in 60 different towns or cities.

The reasons for the higher than average turnout rates in the thriving sub-region of Szentendre can probably be attributed to its distinguishing features. These include aspects such as a well-organised civil society, high levels of schooling and a high number of persons within the total population holding a knowledge-based management or intellectual position.[10] In addition to this, the number of graduates in Budapest and its surrounding area is high, especially in in Szentendre and in Pilisvörösvár.[11] Moreover, Szentendre is the perfect example for a small town located outside Budapest with its inhabitants employed in the capital and belonging to highly educated social groups.[3] As a matter of fact, this trend further benefits from Budapest's proximity. Another important Szentendre characteristic is the local Serbian ethnic minority living on the "peninsula", where the contemporary Serbian cultural, political and religious life was given room to unfold. One

of the reasons why the Serbian ethnic minority is an interesting group in terms of voting behaviour lies in the fact that its members have extraordinarily high levels of schooling.[24] In addition to the Serbian minority there is a Croatian, a Polish, a Greek, a Romani, a Romanian and a Slovak minority. Each of them has a separate local self-government as of October 2014.[16] Seen from a historical perspective the diversity of these ethnic minorities is no definite proof of high election turnout rates[8] but Szentendre's developed political culture has a stimulating influence on its inhabitants.

3.1.3 Vokskabin use levels in Hungary for the counties and Budapest

Summing up the Hungarian users of the three Vokskabin questionnaires we arrive at the following statistics on the counties in relation to their population: The most active counties are Vas county with 617 completed questionnaires, followed by Pest county with 2,370 users and Fejér county in third with 832 users. When looking at Budapest as a county, this picture changes and Budapest takes the lead with 14,475 users. The most passive regions in terms of completed Vokskabin questionnaires are Nógrád county in the north of Hungary with 70, Szabolcs-Szatmár-Bereg county in the north of the Great Hungarian Plain with 295 and Borsod-Abaúj-Zemplén county, which is also in the north of Hungary, with 486 users. When summing up the total user data an east-west and a north-mid-west division emerges, which also mirrors the state of economic development in the whole country. Consequently, it can be stated that the *use levels* of Vokskabin in Hungary are *higher in the economically more developed counties including Budapest,* while the number of completed questionnaires is lower in the more underdeveloped regions of the country.

The first set of questions deployed after the general elections dealt with the implementation of gender equality in Hungary and was presented to the public in a survey containing 21 questions that started on 4 June 2015. The questionnaire was completed by 24,712 respondents until 23 September 2015. The highest number of visitors to the site on one day (more than 17,000) was recorded on 7 July, when Index, the largest Hungarian online portal, reported on the questionnaire.

The examination of all Hungarian respondents at county level leads to similar results as in the past. Pest and Csongrád counties along with Budapest showed the highest activity levels. By contrast, the lowest numbers of respondents were recorded in the counties of Nógrád, Szabolcs-Szatmár-Bereg and Békés. Outside Hungary, user activity was highest in Austria, Great Britain and Germany.

4. Results of the impact study

The questionnaire survey on the effects of Vokskabin that was conducted in December 2015 was completed by 1,240 people. The demographic and regional features of Vokskabin users were confirmed by the impact study. Once again it was the daily internet users in the age range of 25 to 44 years who live in Budapest and in Pest county and have high levels of schooling (university graduates and graduates of other institutions of tertiary education) that completed the questionnaire. The over-65-year olds, the Romani (i.e. those who described themselves to this effect), those with low schooling and the inhabitants of Hungary's less developed regions were particularly underrepresented[8]. Incidentally, this user profile dovetails with the user profile of the readers of index.hu.

[8] For further information about the user profile of VAAs in Western Europe see: S. Marschall (2014): Profiling Users. In, Garzia D., S. Marschall (ed.): Matching voters with parties and candidates, ECPR Studies, Colchester, 92-104.

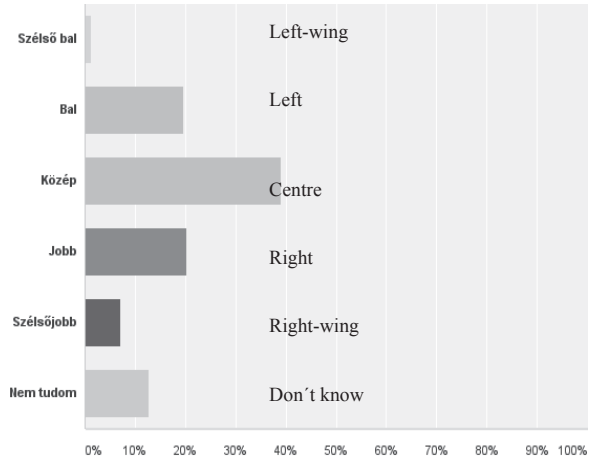

Figure 2: Political ideology of respondents

On the political ideology spectrum, nearly 40% of the respondents chose the political centre, while 20% chose the left side and 20% the right side. 7% considered themselves belonging to the far right. 13% were undecided.

Answer Choices		Responses	
Egyetértek	Agree	39.87%	492
Inkább egyetértek	Partly agree	32.50%	401
Semleges	Neutral	20.58%	254
Inkább nem értek egyet	Partly disagree	3.08%	38
Nem értek egyet	Disagree	3.97%	49
Total	No		1,234

Figure 3: Effects on knowledge

The first question relates to the political knowledge of the user: "To what extent do you agree with the statement that Vokskabin is an important application that helps differentiate between the positions of political parties?" It was answered by 1,234 users. 40% of the respondents agreed and 32.5% partly agreed with the statement. 7% of those surveyed disagreed or partly disagreed with the statement. 20% considered the effect of Vokskabin as neutral.

Answer Choices		Responses	
Igen	Yes	20.02%	247
Nem	No	64.34%	794
Nem tudom	Don´t know	15.64%	193
Total			1,234

Figure 4: Effects on party vote

In the context of examining the voters' decision-making process, when asked the question "If general elections were to be held in Hungary next Sunday, would you let your voting decision be influenced by the Vokskabin results" 20% of the 1,237 respondents answered yes. 15% of those surveyed were unable to define the extent of influence that the application exerted on their selection of a political party.

Answer Choices		Responses	
Pozitívan	Positive	33.23%	411
Negatívan	Negative	0.40%	5
Nem befolyásolja	No effect	46.40%	574
Nem tudom	Don´t know	19.97%	247
Total			1,237

Figure 5: Effects on voter turnout

The question regarding voter turnout: "In your opinion does Vokskabin have an effect on voter turnout (i.e. does Vokskabin make someone go to the polls)?" 33% of those surveyed think that the application had a positive effect on the turnout and 46% think it would not influence the turnout rate. 67% of the respondents would "complete a Vokskabin questionnaire again in the future". Only 2% of those surveyed refused the possibility of completing further questionnaires at some point in the future.

These results has shown similar to the effects pointed out in research studies in Western Europe[9] that VAA usage contributes to higher turnout at elections and has positive effects on political knowledge.

5. Summary and outlook

Based on the use levels of Vokskabin we obtained a significant picture of both the foreign and the Hungarian figures. For the first set of questions, user activity outside Hungary was highest in Austria and Germany: In Austria 4.64% of all users used the application, in Germany this figure was 3.35%. For the April questionnaire, Szentendre turned out to be the most active amongst the cities and towns in Hungary. Outside Hungary, and in relation to the population of each country, the set of questions on the European elections was completed by most users in Austria, Greece and Spain. Like the questionnaire on the European elections from May, the questionnaire on the local elections similarly fell short of expectations. In Hungary merely 473 people completed the questions. By contrast, the rate of users outside Hungary increased by 39% compared to the previous 2 sets of questions: Looking at the foreign figures, first place goes to Germany with 185 users who completed the questionnaire, followed by Austria with 45 users. When looking at the users, a "West German" dominance regarding the European election questionnaire and the local election questionnaire can be observed as far as the regions of Germany are concerned. If a certain part of the Berlin users is included in the calculations, the ratio of those who completed the survey in the area of the former GDR exceeded the 10-percent mark by 1 or 2%.

[9] For an overview about the positive effects of VAAs in Switzerland, Germany, Finland and the Netherlands see the study of Garzia et. al. (2014): The Impact of Voting Advice Applications on Electoral Participation. In, Garzia D., S. Marschall (ed.): Matching voters with parties and candidates, ECPR Studies, Colchester, 105-114.

Examining all of the Hungarian respondents to the 3 sets of questions at county level, the counties of Vas and Pest and the capital Budapest emerged as the most active ones, whereas the counties of Nógrád, Szabolcs-Szatmár-Bereg and Borsod-Abaúj-Zemplén were the most passive. This points towards a chasm in the user population running between east and west and north-mid-west. The same kind of divide was characteristic for the user levels of the questionnaire on equality for men and women and the questionnaire on Hungarian Roma.

The changeable interest in Vokskabin can be explained by its novelty effect. In addition to pedagogues, teachers, artists and public figures, the media and the political stakeholders will have to show significant commitment in order for Vokskabin and voter guides in general to reach up to 20% of all voters, as is common in Western countries. The indispensable prerequisite for this process is the education of Hungarian society, in particular of its young people, whether in an institutional or a political context, which includes education and raising awareness on politics, public life and social studies in a spirit of "civic education" in order to promote social commitment.

In summary, similarly to Western Europe the application is expected to yield future positive effects both in terms of political knowledge and electoral turnout. The basic impact study shown above merely features trends that imply further studies and correlation analyses to be conducted in election periods that enable a more differentiated examination of voters (non-voters, undecided voters, voters with a strong party preference etc.).

6. References

[1] ASSOCIATION FOR EUROPEAN ELECTION OFFICIALS, ACEEEO, Vote Compass – Hungarian general elections, 2010 [Választási Iránytű – Magyar Parlamenti Választások 2010]; http://www.magyarorszagvalaszt.hu/

[2] ALVAREZ, R. M., LEVIN, I., TRECHSEL, A. H., and VASSIL, K.: Voting Advice Applications: How useful and for whom? Journal of Information Technology and Politics, 11(1): 2012, p.82–101.

[3] BECSEI, J.: The geographical distribution of schooling in Hungary [A magyarországi népesség iskolázottságának területi viszonyai]. In: Kiss, A., Mezősi, G. – Sümeghy, Z. (ed.): Scenery, environment and society [Táj, környezet és társadalom]; Studies in honour of Ms. professor Ilona Keveiné Bárány [Ünnepi tanulmányok Keveiné Bárány Ilona professzor asszony tiszteletére] Szeged, 2006. p.99-107.

[4] BUNDESZENTRALE FÜR POLITISCHE BILDUNG (17.01.2014): Die Geschichte des Wahl-O-Mat; http://www.bpb.de/politik/wahlen/wahl-o-mat/176527/die-geschichte-des-wahl-o-mat

[5] BUNDESZENTRALE FÜR POLITISCHE BILDUNG (22.01.2014): Die Nutzer des Wahl-O-Mat; http://www.bpb.de/politik/wahlen/wahl-o-mat/177430/die-nutzer-des-wahl-o-mat

[6] CIVIL RÁDIÓ [Civil Radio], 117 Minutes: interview with Melani Barlai about the launch of Vokskabin on 6 March, 2014 [117 perc, Interjú Barlai Melanival a Vokskabin indulása alkalmából, március 6-án]; http://www.andrassyuni.eu/upload/File/Audio/2014/CivilRadio VokskabinInterview2014.03.mp3

[7] DONAU-UNIVERSITÄT-KREMS Politikkabine, 2012, at; http://www.donau-uni.ac.at/de/universitaet/netpol/projekte/id/10318/index.php

[8] EGRY, G.: The role of national and ethnic affiliation in voting behaviour in Hungary in the 20th century, 2006 [A nemzeti és etnikai kötődés szerepe a választói magatartás alakulásában Magyarországon a 20. században]. Budapest.

[9] EUROPEAN PARLIAMENT, European and national elections figured out, Special edition – European elections, 2014; http://www.europarl.europa.eu/pdf/elections_results/ review.pdf

[10] FORRAY, K.: Social and geographical factors influencing employment and unemployment; closing study of research no. OFA/6341/26, 2008 [A foglalkoztatottság és a munkanélküliség szerkezetét befolyásoló társadalmi-területi tényezők, Az OFA/6341/26 sz. kutatás zárótanulmánya.] Oktatáskutató és Fejlesztő Intézet [Institute for educational research and special needs]. Budapest, http://www.forrayrkatalin.hu/doski/OFA_tarsadalmi-teruleti.pdf

[11] FORRAY, K. and HÍVES, T.: The geographical correlations between schooling, employment rates and commuting, 2009 [Az iskolázottság, a foglalkoztatottság és az ingázás területi összefüggései] Szociológiai Szemle [Sociology Digest], 19(2): 42-59, http://www.szociologia.hu/dynamic/SzocSzemle_2009_2_42_59_ForrayK_Hives.pdf

[12] GEMENIS, K. and ROSEMA, M.: Voting Advice Applications and electoral turnout. Electoral Studies, 36, 2014, p.281-289, http://dx.doi.org/10.1016/j.electstud.2014.06.010

[13] HEINRICH HEINE UNIVERSITÄT, Philosophische Fakultät: Wissenschaftliche Forschung zum Wahl-O-Mat, 2014, http://www.wahl-o-mat.uni-duesseldorf.de/

[14] HUNGARIAN ELECTORAL COMMISSION [Nemzeti Választási Hivatal] Voting at embassies and consulates in 2014, 2014 [Külképviseleti szavazás 2014], http://www.valasztas.hu/hu/ogyv2014/859/859_0.html

[15] HUNGARIAN ELECTORAL COMMISSION [Nemzeti Választási Hivatal] (2014): Election of the members of the Hungarian parliament Voter turnout figures and ratios [A választáson megjelentek száma és aránya], http://valasztas.hu/hu/ogyv2014/858/858_0_index.html

[16] HUNGARIAN ELECTORAL COMMISSION [Nemzeti Választási Hivatal] (2014): Information on the election outcomes of the ethnic minorities in Szentendre [Tájékoztató adatok Szentendre települési nemzetiségi választás eredményeiről], http://www.valasztas.hu/dyn/onk14/szavossz/hu/M14/T126/tjknemz.html

[17] HVG (author not known): KSH [Hungarian Statistical Office]: 335,000 Hungarian adults with a registered Hungarian address live abroad, 11.07.2013 [335 ezer magyar lakcímű felnőtt él külföldön, 2013.07.11], http://hvg.hu/gazdasag/20130711_KSH_335_ezer_magyar_lakcimu_felnott_el_ku/

[18] ISIDEWITH (2012): About us, http://www.isidewith.com/about/

[19] ISIDEWITH (2012): Frequently Asked Questions, http://www.isidewith.com/faqs/

[20] IRÁNYTÜ POLITIKAI ÉS GAZDASÀGKUTATÒ INTÈZET, 2011 [Compass Institute for Politics and Economic Research]: {ut2]: http://iranytuintezet.hu/r%C3%B3lunk

[21] KFTKREÁTOR: Do up to 600,000 Hungarians work abroad? [Akár hatszázezer magyar is dolgozhat külföldön?] http://kftkreator.hu/cikk.html

[22] POLITICAL CAPITAL, 2001: http://www.politicalcapital.hu/magunkrol/mi-a-political-capital/

[23] SZENTENDREI MÈDIAKÖZPONT ÉS KOMMUNIKÀCIÒS KFT: [Szentendre Media Centre Media and Communications Ltd] 2014: [The first data on the region arrive today] Már érkeznek az első adatok a térségből, http://tvszentendre.hu/hir/mar_erkeznek_az_elso_adatok_a_tersegbol

[24] SERBIAN SELF-GOVERNMENT in Hungary: http://www.szerb.hu/hu/

[25] WAGNER, M. and RUUSUVIRTA, O.: Matching voters to parties. Voting advice applications and models of party choice. Acta Politica, 47: 2012, p.400– 422.

[26] WALGRAVE, S., NUYTEMANS, M. and PEPERMANS, K.: Voting aid applications and the effect of statement selection. West Eur. Polit. 32, 2009, p.1161–1180.

[27) WAHLKABINE: www.wahlkabine.at

E-Petitioning in Environmental Matters in Romania: Is It an Effective Environmental Governance Tool?

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Abstract
E-petitioning related to environmental matters is a rather new participatory behavior in the Romanian society and it seems to attract more and more the attention of a larger public (not just a minority of educated eco-citizens or experts in related fields). Lately, in Romania there were a few major e-petitioning campaigns trying to stop large and popular economic investments projects that were detrimental to the environment (the most visible are petitions fighting the building of micro-dams on mountain rivers, regional landfills, mining projects). Also, those campaigns led to media coverage, brought on a public debate through some media channels, revealed serious problems with how the state authorizes such projects, and even managed to get the attention of the European Commission. None of these would have been possible without the very source of large public mobilization on an environmental matter, e-participation and e-petitions.

Thus, the paper investigates e-petitions in the environmental field in order to understand their impact on environmental problems, and also, most importantly, if these e-petitions manage to influence environmental policy and governance. For decades, through the entire process of European integration, Romania has struggled with meeting the environmental standards required by the EU. Data is lacking or unreliable, there is a culture of lack of transparency related to environmental matters both in the public and in the private sector, and Romania needs to seriously address this problem. The paper provides an investigation of 'if' and 'how' e-petitioning could be a tool to move state and society towards effective environmental governance in the Romanian context.

1. Public participation and its role in environmental governance

The paper places the subject of e-petitions in the wider context of environmental policy making and governance, in order to understand the role they play in facilitating public involvement and good governance. Some insights into the theoretical aspects of participation and governance and a minimal diagnosis of the level of participation and governance manifestations in Romania are necessary in order to provide context for environmental e-petitioning and understanding why this movement is so important for the Romanian context. Given the scope of this paper, the most relevant theoretical issues in relation to the research subject are selected.

With regard to public participation the theoretical approaches are numerous and rich in significance when applied to environmental governance.

A minimal definition of participation includes any type of involvement of non-state actors, as members of the public or as organized stakeholders, in any stage of governmental policy making including implementation [9]. The general purpose of participation is to contribute to the quality and implementation of decisions as well as their legitimacy.

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Research into the rationales for public participation resulted in recent studies proposing comprehensive and easily applicable models; thus, Wesselink *et al.* (2011) discuss three major rationales for participation: instrumental – targeting increased legitimacy of policy decisions and improved results; substantive – increasing information input, gives more substance to proposals, makes decisions that address problems in as much depth as possible, improving the quality of decisions; and normative – linked to democratic ideals and values, including all affected parties into policy decisions for fostering maximum public involvement. Different from this theoretical categorization, other approaches try to identify all the possible benefits and justifications for public participation. One such rationale that applies in particular to our discussion is resolution of political and societal conflicts by means of alternative mechanisms and empowerment of marginalized groups which have been left out of environmental governance.

Although the literature in this field is large and comprehensive, the discussion will be limited to elements applicable to the situation of environmental governance in Romania. Rather the legalistic rationale applies to the Romanian public administration, central government and central agencies included. This rationale, proposed by Wesselink *et al.* (2011), applies for participation organized only to meet formal requirements. Compliance with rules is necessary to get things done, but this process is likely to be only a formality without any uptake of results [9].

There is relevant literature analyzing the rationales and discourses used by public authorities in participatory processes [7], but there are fewer attempts at theorizing the participants' discourses on participation, mostly based on a case-study approach.

Recently, the environmental governance literature addresses the need for a transformative change needed in order to address the most important global environmental problems (climate change, ecosystem sustainability). There seems to be a consensus that the status-quo is not working for environmental protection. Following from this, methods and models to improve environmental governance are addressed in most studies: transformative changes that are invoked in the literature need large involvement and participation – thus the relevance of public participation and the extensive interest in the best ways to consolidate it.

Basically, studies on participation try to address ways 'to create rapid mobilization that will educate the public about environmental issues and raise social consciousness with regard to the need for policy reform that will support more radical approaches to environmental problems' [6].

According to Jacoby (2012), in this new paradigm, the role of the public is fundamentally changed, from stakeholder of an environmental resource (term which implies opposition, polarization, protecting one's stake) to partner in social and political change efforts needed to address environmental issues. This shift in perspective is characteristic to recent literature development in public participation in environmental policy and governance [6].

Another relevant argument is that there is a perfect fit between these recent developments in environmental governance and the new e-communication tools that are so ubiquitous in this age.

Disappointment with traditional public authorities led public participation, such as public hearings or formal public consultations, originates in the lack of empowerment through such processes, cynicism with regard to the ability to influence decisions, opposition, polarization (jobs versus the environment), and even the need for litigation from communities.

All these failures of traditional paths for public involvement have given rise to new bottom-up participatory trends in environmental decision-making. Informal community-based evidence with regard to environmental problems and other manifestations of informal environmental leadership can allow communities to create change and empower citizens, if they succeed in finding an effective way into the policy process (either by relevance of information and/or by extent of public involvement). Basically, new e-communication tools are creating new opportunities for these invisible informal leaders (citizen leaders) to create collaboration, consensus and compromise, opportunities for inclusiveness and shared power rather than just articulate dissent (as in the case of public meetings or formal policy dialogue) or communicate information to decision-makers.

In time, these online groups become virtual communities united by core beliefs and values that further motivate their civic behavior and influence public opinion and decision-making at policy level. Socio-ecological problems at the heart of environmental policy are much too complex to be dealt with through simplistic procedures, thus the need for a new paradigm for citizen involvement in environmental issues and new tools that can respond to the exigencies of contemporary public participation [8].

2. Environmental governance in Romania, the role of public participation

This section consists in an explanation for the state of environmental governance and public participation in environmental matters in Romania: the process of development and implementation of environmental policy in post-socialist Romania has prevented public involvement in environmental policy and establishment of stable patterns of cooperation with non-state actors.

In Romania, central government agencies play the main role in environmental decision-making so, traditionally, the citizens must turn to government in attempts to protect the environment and their quality of life. Public participation procedures and the way the authorities understand to manage them clearly do not have as a result efficient environmental problem solving, with adequate community consensus and participation. Citizens or civil organizations attempting to participate in these procedures with the intention to influence decisions in early stages of environmental decision-making are frustrated by the lack of transparency of these meetings, the adversarial character, time limits, lack of dialogue, lack of expertise or expert advice, that they occur too late, when decisions are too advanced to influence the outcome, that they find an already made coalition with economic interests (recently this happened in the context of waste regulation [4], [2]). Citizens are also frustrated by the consultative character of the public hearings and lack of impact of participation in the outcome.

As a result, participation is limited in Romania and there is an acute need for solutions in order to make environmental decision-making more transparent, inclusive and legitimate. Adoption of EU top-down environmental policy (especially during accession negotiations) means that environmental policy in Romania did not pass through a participatory process in order to look for solutions for environmental problems, but was rather a top-down policy implementation, which became mostly ineffective due to the fact that it was not connected to any environmental values. These environmental values are missing, both in the public sector and in society in general, together with environmental literacy (e.g. sustainable development, climate change, carbon literacy, etc.). Even if, from a legalistic perspective, the Romanian environmental legislation transposes the participatory mechanisms included in the EU Directives (e.g. Council Directive 92/43/EEC – Habitats Directive; Directive 2000/60/EC – Water Framework Directive; Directive 96/61/EC –

IPPC Directive), there is a huge gap between legal provisions and their superficial implementation, leading to a participation deficit in environmental policy making in Romania.

This diagnosis comes at a time when environmental literature discusses participation fatigue in countries implementing different tools and methods designed to increase public participation in environmental decision-making (based on research efforts to understand the rationales for participation from the perspectives of all stakeholders). If the recent specialized literature discusses a shift from stakeholder to citizen leadership, than the case of Romania is different: in order to implement the latest developments in participation we would have to jump over the stakeholder phase, since stakeholder involvement did not effectively happen in environmental decision-making in Romania.

The Aarhus Convention, giving free access to environmental information also applies in Romania, but transparency is limited because institutions do not collect or integrate some of the most basic data that would be of interest to the public. Also, there is no pro-active approach to public information; in 2016 there was a petition of several environmental organizations requiring that the Ministry and National Environmental Protection Agency offer decent websites to the public, with relevant information (still unresolved). Even some legal documents (annexes to Minister's Orders are not publicly available, some of them are only available as hard-copy at the Official Journal of Romania, in the capital city and can be accessed only with pay at their institutional headquarters).

In one relevant study of environmental governance in Romania, Buzogány (2009) illustratively used the syntagm 'forms without substance' to describe the situation in Romania where, formally, there are some governance mechanisms present in the legal framework and implementation methodologies, but no real manifestation of those governance mechanisms in the policy process (formal role of consultative bodies, formal or only reported public consultation, formal public information and limited public access to information, no impact of stakeholders other than state or industry lobby in policy decisions) [1].

Important barriers to public involvement come from the heritage of socialist environmental policies and the problems of the transition and accession periods: no or low priority for the environment in policy; institutional fragmentation; preference for and prevalence of the command and control approach to environmental policy; an administrative culture hostile to public participation; frequent institutional changes; political appointments in environmental protection institutions at central and local level (personnel appointed by central political government). So, there was little room for civil society involvement (and this also influenced the development and profile of the civil society).

Competencies in environmental policy fields are mostly centralized, implementation and control is done by central state agencies with sub-structures in the sub-national administrative units and responsible to the central agencies (top-down steering and control), leaving little space for new provisions of participation mechanisms relevant in the context of environmental governance.

3. E-petitions as part of digital environmentalism

The e-petition is a participatory instrument linked closely to other new emergent concepts in the field of environmental governance – online ecosystem, digital environmentalism, and democratization of science.

There are both opportunities and risks that come with these new approaches to participation in environmental governance. Opportunities come from several particularities of online participation: ideas can be presented incomplete, as work in progress, and can be refined in the process of online public participation (for e-petitions through commentaries made by supporters and signatories), fostering local knowledge, and experiential knowledge from those who work closely or in relation to the issues addressed. There is also a huge opportunity stemming from the larger access to the general public, more specifically turning the elitist environmental movement (this is largely the case in Romania, where experts, practitioners, community activists and highly educated people are part of a minority environmental civic movement) into a broader social movement. This happened, using mostly social media for several months in 2013-2014, with street protests peaking in January 2014 to oppose cyanide mining projects in Romania. These protests were considered the largest protests since 1990, and they were followed by mobilization of this larger community by e-petitioning to initiate and keep a close scrutiny on proposals to modify the mining legislation.

Other opportunities come from timely or in real time reporting possibilities, and continuing conversations after significant events (legislative adoption can be followed through implementation), monitoring new developments (especially important for environmental problems, which manifest complexly in time and space and for environmental policy, which is subject to complex interactions with other policy fields).

One risk is that these communities are built on shared ideas and values and there is not enough dissent to develop complete and refined participatory tools through e-petitions. Environmental organizations were clearly favored by the use of online tools, having the opportunity to reach a large audience, but this also entails the risks associated with 'democratizing science' – experts and simple citizens have the same status and reach in online communities, dialogue is not always constructive or conclusive, arguments with different weights are competing in the same arena. It is difficult to manage science-informed policy or governance agendas specifically because of this greater number of participants in the debate (visible in climate change governance). Closely related to this risk, there is the risk of capture from misleading or malevolent parties promoting pseudo-science, denialism, conspiracy theories, the newer 'alternative facts' approaches. Greenwashing, usually done by companies but also by other organizations pretending to work for the environment, is also a potential risk, since it is facilitated by use of online tools.

The most compelling critiques to e-participation in general and e-petitioning in particular come from the activists themselves. The term used for signatories of online petitions with no other positive contribution to follow the environmental policy process is 'slacktivism'. It includes behaviors such as liking or sharing on social media networks, signing petitions, confirming participation to real-life events but never actually participating (armchair activism), having no real involvement or engagement with the issues brought about by the activist movement [8].

However, the same literature shows that there is significant advantage for environmental organizations who manage to keep a large, active, well-connected network, which has as a main advantage the unimpeded flow of information. These organizations themselves report that the size of the network compensates for slacktivism or less-engaged membership [8].

4. Research methods

The manifestations of participation through e-petitions in environmental matters were analyzed by two methods: content analysis of petitions and semi-structured expert interviews.

The research endeavor was more of an exploratory one, rather than to test specific research questions with regard to e-participation. The attempt to describe and understand the potential of green e-petitioning was guided by a few general assumptions:

- Citizens are in a position to raise new facts, concerns, and questions in order to require public agencies to further research the implications of environmental decisions.

- The e-petition has the potential to be an effective governance tool.

- The e-petition has the potential to contribute to the resolution of political and societal conflicts by means of alternative mechanisms and empowerment of marginalized groups which have been left out of environmental governance.

4.1 Content analysis of petitions

In order to understand e-petitioning in environmental matters in Romania the environmental e-petitions available on the Romanian online platform https://www.de-clic.ro/ were analyzed. Given the author's expertise in environmental policy, the subjects addressed by the petitions were familiar and thus an assessment of the overall quality of the arguments brought, of the requests made and the general overlap (if any) of the discourse with other interests was possible.

There is an opportunity provided by e-petitions to communicate directly to the public, making it possible to foster large support for the environmental issue presented in the petition that is not possible for other participatory mechanisms, such as public hearings or consultations. Resulting from this advantage of the e-petition, the research assumption was that analysis of the types of issues addressed by citizens, of the arguments brought, or the difficulties expressed with regard to civic involvement (including in the comments sections), would offer a better understanding of the environmental policy process.

The content analysis observed:

- Analysis of petitions' content available on the site (quality of arguments and requests);

- Subject of the petition (if it is reactive to government failures or market failures);

- Analysis of discourse on participation and environmental governance underlying these petitions (independent on the subject of the petition);

- If there is an assumed identity and interest of petitions' initiators (stakeholder, collaborator, consultant, part in a conflict) or if such identity can be inferred from the discourse and arguments.

In total over 200 e-petitions were reviewed. The platform is dedicated to any subjects of concern for civil society, but the vast majority of petitions are environment-related (e.g. labelled public health but contesting the authorization awarded to an air polluting company, or addressing public transportation or water quality issues, etc.). Signing of the e-petition on this particular electronic platform (de-click.ro – civil society in action) requires providing information on name, family name, e-mail address, phone number and county of residence. Thus there is no verification and validation procedure for the individual signatures by citizens. There is no reference in the Romanian

legislation on petitioning with regard to electronic petitions addressed to public institutions or electronic signatures of citizens (only that petitions can be sent by electronic mail and that identification data of the petitioner are required) [5]. However, lists of such electronic signatures were annexed to petitions lodged with authorities and were accepted (thus a response was provided to the person/organization who assumed the identity of petitioner, providing address, phone, e-mail, but no personal identification numbers or other proof of identity are required).

The content analysis revealed some surprising facts. The expertise level of the majority of the petitons is very high and high, in direct relation to the complex subjects they address. The most extensive and successful petitions were for saving a protected river from micro-hydro (almost 50,500 signatures), proposal of Rosia Montana for UNESCO World Heritage status (10,800 signatures), banning cyanide mining (multiple petitions, until now they managed to bring legislative modifications proposals). The e-petitions are very well documented and provide quality information, in a comprehensive style, with links to additional sources. The quality of the requests is very high. They indicate very clearly the measures required from the authorities with exact legal reference and legal justifications for additional measures (including litigation). There is extensive follow-up to the most important petitions, the feedback given to signatories is timely and complete, giving an exact image of the development of the problem. Also, in order to test the language of the petitions on non-experts, with the purpose to see if the e-petitions are too complex for non-experts, first year students were asked to read, comment, explain their understanding of the petition (students from the Public Administration program who did not take a course in environmental science by that time). The conclusion was that, with the exception of some legal references, they could understand the problem stated, the context and what the e-petition asked from the authorities. A minority of the petitions (less than 20%) seem to be initiated by non-experts. They address environmental matters of community interest (saving a local river from extending road infrastructure, allocation of road space to buses and bikes, stopping waste incinerators projects, closing down toxic waste deposits, etc.). The language is clearly different, less expert, although very clear and coherent problem framing and requests are made. Overall, the e-petitons are extremely well documented and, as tested on non-experts, can speak clearly to non-experts. It is probably a factor of their success in reaching large audiences (in 2016, the platform reported over 120,000 individual signatures).

A vast majority of the petitions are reactions to government failures. They denounce the environmental problem as a mix of market and government failures, but there are always presented breaches of legislation, lack of consultation, illegal influence of interest groups. The requirements are for measures to be taken by the competent authorities in order to review documents, authorizations, decisional processes and include arguments of the public in their decision. A lot of the petitions demonstrate illegal practices of competent authorities (related to waste, mining, forest management, protection of natural areas, including Natura 2000 sites). Some of these breaches are confirmed by European Commission investigations and NGOs. Only 4 campaigns framing the problem exclusively as a market failure were identified, all related to forest management and wood processing and selling. E-petitons were addressed to Holzindustrie Schweighofer, accused of buying illegally cut wood, Forest Stewardship Council, accused of providing unverified certification to the company, and large retailers accused of selling products resulting from illegal wood cutting (the story was extensively covered by the media and involved environmental NGOs from all over Europe, resulting in the decision of Forest Stewardship Council to revoke the sustainability certification [3]).

Only a minority of e-petitons address larger environmental governance issues (framing the problem also as one directly linked to transparency, access to information, lack of public involvement) and stressing the overall importance of participation for the quality of the environment and the public interest.

Very complex petitions mentioned all the initiators and important campaigners, smaller / narrower petitions are signed by a natural person (with full name), no e-petitions were found that seemed manipulating or deceiving or trying to promote other interests, that are in contrast to the environmental character of the petition. Overall, the platform is transparent enough with regard to sources of support, campaigners and activists involved.

4.2 Analysis of expert interviews

For conducting the semi-structured interviews experts in the environmental field were selected, based on their involvement at least once in organizing a participatory process related to environmental policy-making from the perspective of stakeholders other than the state authorities. A preliminary discussion and prior collaboration ensured that the experts had an understanding of the environmental governance in Romania, the general context in which participation in environmental matters happens in order to make sure that their responses reflect an overall view of the policy process, not just their individual experience with participation (since experts were asked to discuss the opportunities offered by the online methods). The short questionnaire did not include references to the normative framework of participation or governance; rather the aim was to identify a conceptual pattern in the answers in the analysis phase.

During January 2017 requests for interviews were sent by e-mail to experts from the private sector (consultants) and civil society organizations. Only 6 experts accepted a lengthy interview (2 by phone), some preferred to send answers by e-mail (and were only partially used in this analysis).

The instrument was developed around 4 major issues regarding e-petitions: potential impact on the policy decisions, expectations from this form of e-participation (other than to influence decisions), the role of e-petitioning in environmental governance, opinion on the virtual environmental communities in Romania. Not all the questions and all relevant answers were included in the paper, due to space limitations.

The first question in the interview regarded the *potential impact of e-petitions on the environmental policy process and specifically decisions in environmental matters*.

Discussions with experts were complex and rich in examples from other countries where e-petitions are largely used by the public. There is a general opinion expressed in the interviews that it is difficult to measure the impact of e-petitions on the policy decisions. Even if the policy decision reflects the requests of e-petitions, there is no final conclusion that the e-petitions resulted in that decision. The policy process is complex, and there should be a complete analysis of all the stakeholders' input in order to determine if and how interests converged and what other external pressures were exerted. None of the experts was willing to say that environmental decisions can be influenced in a significant way by the use of e-petitions. The experience of working with public authorities consolidates the opinion that in Romania the most influent forces do not manifest publicly and transparently and public authorities do not openly report on decision-making processes (similar to the rapporteur procedure of the European Parliament, for instance). This question started the most interesting discussion during the interviews and other topic-related discussions, but they

were not about e-petitions, but rather about problems in Romania with the environmental policy process and its lack of transparency. To conclude, experts (the author included) did not believe in the potential of e-petitions to significantly influence environmental decisions if are not followed by other participation mechanisms that involve a more 'physical' pressure on public authorities.

Following this quite pessimistic discussion, the next objective was to see if there is any *role of e-petitioning in environmental governance.*

From the responses it results that e-petitioning as a societal participatory behavior is an important driver for good environmental governance. The experts' responses made reference to education, rising public awareness, creating a sense of community, disseminating important information, creating a general understanding of the relationships between environment and quality of life (creating an individual stake in environmental participation), fostering a general attitude of support for the environmental agenda.

Most significantly, the respondents stressed the importance of values and value-driven participation in society in general, and the underlying problem of missing environmental values of the general public. There is clearly a long way to go from public sector formal requirement of participation to a widespread culture of participation, and it is hard to say where exactly participation drivers should be placed first. With a general disappointment in the state capacity to follow long term strategies and the public interest (especially after the last election, since interviews took place in January 2017), the majority of respondents placed their bet on the civil society organizations and external support for such organizations. This view influenced the unanimous recognition of e-petitions as a potential tool for spreading environmental values, and fostering public education and civic engagement in environmental matters. However, as stated above, there is little hope with regard to the measurable outcomes of e-petitioning in the environmental field. The experts say there are no real pressures for the authorities, that public officials react to established interest and lobby groups and easily ignore this 'light' form of activism.

Do e-petitions increase public participation of the non-experts? Is this participation meaningful for environmental governance?

To summarize the experts' opinions – yes, but this is not necessarily important for the policy decisions made in the environmental field in Romania. It is important from a governance perspective, if we consider that these examples of participation are among the very few arguments for the existence of any forms of environmental governance in Romania (other than the command and control approach to policy). In terms of outcomes, the environmental movement still relies on expert participation.

As an expert, what would be legitimate expectations regarding participation through e-petitions in Romania?

For this question, experts observed that it should be addressed to those involved specifically in e-petitioning campaigns, since they could discuss their expectations. In terms of the role that could be played by e-petitioning, respondents saw the use of e-petitions to be linked more with objectives such as raising awareness, education and signaling a specific acute environmental problem (and were not sure that initiators of e-petitions have as an expectation public education and not the more tangible objective of solving a problem). The respondents saw limited role or contribution of e-petitions to more complex outcomes of participation, such as quality of policy-making, legitimacy

of decisions, adding relevant information to the decision-making process (the normative and substantive rationales identified in theory). One respondent said that in his participation procedures 'they had their eyes on the prize', no long-term goals were attached to the participation process. After reflection on responses, the conclusion was that expectations related to e-petitioning could be divided into short-term and long-term ones: addressing immediate environmental problems is an initial expectation, but any environmental participation endeavor increases the quality of governance and public awareness and eventually results in more effective environmental problem solving. It is not useless to attach long-term goals and expectations to e-petitioning campaigns, since they set the ground for the way environmental issues are solved in the future. Such expectations could be included in the short text of the petitions, to convince the public of the added value of participation on the long term.

From the public authorities' perspective – can e-petitions provide the basis for more inclusive participatory instruments?

When asked what their impression was regarding public hearings and consultations initiated by public authorities and their explanation for low public participation with these procedures, the answers all supported the legalistic perspective. The experts interviewed mentioned EU requirements / mechanisms imposed by EU Directives, a legal formality that has to be checked before the permit / act / authorization is issued, in order to make sure that decisions are not contested in court for procedural reasons and to limit complaints by community members.

Respondents mentioned barriers to public participation during the policy process, including implementation: in general, no tradition of public participation (other than electoral processes), low administrative capacity at the local level, lack of expertise in participation in environmental matters on both sides, the authorities and civil society organizations, institutional framework deficiencies at the central level (fragmented competencies between different institutions – e.g. Romania has a Ministry for the Environment and a separate Ministry for Water and Forests, and several central agencies dealing with separate environmental fields – National Agency for Environmental Protection, National Agency for Protected Areas, Administration of the Biosphere Reserve the Danube Delta, Administration for the Environmental Fund, etc.).

Another constant source of deception (by the authorities) is the decision-making locus (EU level) and lack of capacity to influence decision-making at this level. There is a general official discourse of over-regulation from the EU level in the environmental field and imposed decisions, and this widespread discourse affects public attitudes towards participation, since the public fails to see the state discretion offered by directives or the implementation mechanisms, or the fact that the little participation that does occur is mandated by EU legislation and done for fear of infringement procedures.

In this context, platforms supporting e-petitions and other forms of environmental participation offer more comprehensive information and participation opportunities than what the public sector currently offers as participation options. These platforms become a good practice for the public authorities (especially municipalities) to follow.

From the civil society perspective – do you see e-petitioning as a form of participation or rather as a defense mechanism in situations of both state and market failure?

Experts see e-petitions mostly as a last resort defense mechanism, especially when citizens are faced with government failure (permitting without including consultation results, corruption, environmental discrimination, etc.).

How prominent is the role of virtual communities in environmental decision-making in Romania? Can virtual communities raise general awareness on environmental matters affecting communities?

Experts are aware of the presence of an emergent virtual community in the environmental field in the last few years. They continually build their capacity on keeping on the public agenda the most pressing environmental problems in Romania (waste, deforestation, mining projects), but with an increasing public credibility due to their independence. They have large reach on social networks and can mobilize rapidly to gather support for their e-petitons and other e-campaigns. The only worry is that recent civil involvement projects regarded fight against corruption and this would place them too close to politics (by initiating e-petitions for removing from office the Romanian Ombudsman). It is a matter of debate, however, if they reach to people who are most likely to be victims of environmental discrimination exclusively by online means of communication. The most exposed and vulnerable communities are not the likely public of environmental campaigns using online tools.

5. Conclusions

This section is not a list of solution proposals. These are unlimited, as is the potential and opportunities offered by the transition to environmental governance, increasing levels of education, awareness and interest in environmental matters and the e-tools available to foster good governance in the environmental field. There are, however, a few pre-requisites for such endless solutions to be at hand for public, private or civic organizations working for good environmental governance.

One such pre-requisite is the administrative self-reform with regard to transparency and public participation. As stated before, the tradition of formal / legalistic participation has to be replaced by internalized participatory processes linked to concrete outputs, such as quality of environmental solutions, effective governance, transparency and accountability in environmental matters, sustainability, etc. After this self-reforming process, the public administration can make other transitions with regard to participation mechanisms: from information to consultation, from consultation to involvement, from involvement to partnership with the citizen in environmental decision-making. Awareness, education, community building and values consolidation are achieved at all levels of public participation.

Until recently there wasn't any relevant public participation in environmental matters in Romania, citizens readily accepted state decisions and / or expert authority. The recent rise of e-petitions reflects a major change in this paradigm.

6. References

[1] BUZOGÁNY, A.: Romania: Environmental Governance – Form without Substance, in: T.A. Börzel (ed.), Coping with Accession to the European Union, New Model of Environmental Governance, Palgrave Macmillan, 2009, pp. 169-191.

[2] CAPITAL (Business magazine), 'The bomb related to unrecycled packaging waste will explode in supermarket prices', January 25th, 2016, [Online] at http://www.capital.ro/

negocierile-au-esuat-gunoaiele-nereciclate-aruncate-in-bratele-lui-ciolos.html, accessed on March 10th, 2016.

[3] FOREST STEWARDSHIP COUNCIL (FSC), Decision to disassociate in case Holzindustrie Schweighofer (HS), [Online] at https://ic.fsc.org/en/what-is-fsc/what-we-do/dispute-resolution/current-cases/holzindustrie-schweighofer-hs, accessed on March 10th, 2016.

[4] GANDUL (Newspaper), 'Billion dollar scandal on the waste market. 2,000 companies complain that are being taken out of the game by the new law on waste management services: who is the politician directly interested in the law being implemented', February 14th, 2014, [Online] at http://www.gandul.info/stiri/scandal-de-un-miliard-de-euro-pe-piata-deseurilor-2-000-de-firme-se-plang-ca-sunt-scoase-din-joc-prin-noua-lege-a-salubrizarii-cine-e-deputatul-direct-interesat-ca-legea-sa-treaca-12121748, accessed on March 10th, 2016.

[5] Government Ordinance no. 27/30.01.2002 on regulating the activity of solving petitions, published in the Official Journal of Romania no. 84 from 1.02.2002.

[6] JACOBY, J.B.: Moving From Stakeholder to Citizen Leadership, in: D. Rigling Gallagher (ed.), Environmental Leadership. A Reference Handbook, vol. 1, Perspectives on Environmental Leadership, Sage, Thousand Oaks, 2012, pp.336-344.

[7] ROYO, S., YETANO, A. and ACERETE, B.: E-Participation and Environmental Protection: Are Local Governments Really Committed?, in: Public Administration Review, vol. 74, no. 1, 2013, pp.87-98.

[8] THALER, A.D., ZELNIO, K.A., FREITAG, A., MACPHERSON, R., SHIFFMAN, D., BIK, H., GOLDSTEIN, M.C. and MCCLAIN, C.: Digital Environmentalism, in: D. Rigling Gallagher (ed.), Environmental Leadership. A Reference Handbook, vol. 1, Perspectives on Environmental Leadership, Sage, Thousand Oaks, 2012, pp.364-373.

[9] WESSELINK, A., PAAVOLA, J., FRITSCH, O. and RENN, O.: Rationales for Public Participation in Environmental Policy and Governance: Practitioners' Perspectives, in: Environment and Planning A, vol. 43, 2011, pp.2688-2704.

Factors Influencing Declining Voter Turnout – A Case Study in Neu-Ulm

Anton Bullinger[1], Alexander Prosser[2]
and Birgit Schenk[3]

Abstract
This paper is a continuation of a contribution published [1] *by the same authors analysing possible reasons for low voter turnout in the City of Neu-Ulm. This paper operated under the limitation that only summary voter participation data from past elections was available which could be matched with demographic data from the city constituencies. Data that could be used to derive individual motivation was not available. To remedy this limitation, a questionnaire was sent to 3,000 inhabitants of Neu-Ulm to relate their voter participation to several possible factors influencing the propensity to vote and to derive recommendations for the City Council how to improve on voter participation in future elections. This contribution presents some preliminary results from the study.*

1. Introduction

1.1 The Issue

Over the past years voter participation in Neu-Ulm has dropped in a dismal way, where in the last municipal election, only 37.9% participated as compared to 67.9% in the last federal election 2013[1]. In the past municipal elections, turnout has been monotonously falling in all city constituencies. The city administration was alerted to this and commissioned a study to analyse the dropping turnout against certain demographic properties in the constituencies. The linkage between the demographic properties and the fact whether a person voted or not would have been available in the voter roll but could not be analysed due to legal constraints. Only a summary analysis could be performed broken down by the 12 constituencies in the city.

The main results were that (i) age had no influence on turnout, (ii) the share of second residences had no influence[4], (iii) the share of foreigners (EU and non-EU) had a negative correlation with turnout, however cannot have been the decisive factor, as only 1/6th of Neu-Ulm's population is foreigners (half of them EU foreigners who are eligible to vote), (iv) duration of residence of Germans which shows a strong correlation between average duration of residence in a constituency and its turnout. However, only summary data of the municipal constituencies was available, no information on individual motivation.

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[4] Holders of second residences are not allowed to vote in the municipal election, but a large share of them in a district could lead to alienation, bedroom-town effects etc. and thereby negatively impact turnout. This was however not observed.

1.2 Extended Study

To remedy this fundamental limitation, a questionnaire was sent to 3,000 (main or secondary) residents of Neu-Ulm who were randomly selected (see Annex, questionnaire in German). 917 questionnaires were returned, which is a rather high percentage, almost one third. [2] As only a sub-proportionally small group of secondary residents answered the questionnaire (1.7% as compared to 4% secondary residencies), they were excluded; 103 respondents did not answer the question (11.2%); hence only the main resident respondents, that is 798 or 87% of all respondents, were included in the analysis.

The distribution of questionnaires over the city districts (ie, constituencies) significantly deviated from the distribution of the population in that larger districts had a relatively lower return rate than smaller, rurally structured districts – not a completely unexpected effect (cf. Figure 1). Concerning age, the same effect was observed, elderly respondents were significantly overrepresented in the sample (see Figure 2).

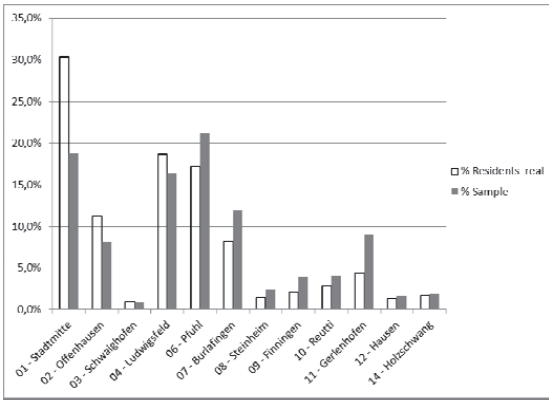


Figure 1: Distribution of residents real (main residencies only) and in the sample, X2 test significant on 99% level.

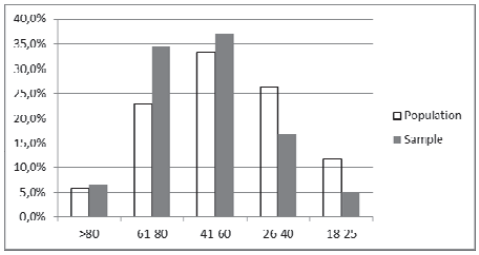


Figure 2: Distribution of age groups in the population and in the sample, X2 test significant on 99% level.

The largest bias in the sample, however, concerned the foreign respondents: Out of the 798 respondents who indicated a main residence in Neu-Ulm, only 27 did not have German citizenship. Altogether, there are 16.8% foreigners in the city (EU or non-EU) [1], but only 3.4% of the respondents belonged to that group. This already in itself leads to the first result of the study: *The foreign population (EU or non-EU) is clearly not integrated/integrating into the political life of the municipality.* Since the number of foreign respondents is so low and any results specifically derived *within* this group would be at the borderline of statistical validity, the empirical analysis in the following section will not distinguish between foreign and German population; however, in some case, X2 tests are performed between foreign and German respondents. In all analyses, the bias towards the smaller suburbs and towards older age groups has to be borne in mind.

This is the background of the study presented herein. The issue of declining voter turnout is a general one, the detailed data available for Neu-Ulm may hence serve to shed some light on the general problem beyond the case of application. The following section therefore introduces this more general topic. Sections 3 and 4 are then dedicated to a more detailed analysis of the questionnaire data.

2. Motivation to Vote

2.1 Explanatory Views

There are several models in the literature to explain civic engagement, which can be seen as the superset of voter participation. Verba et al. [3] introduce a resource-based view: They introduce time, money (cf. pp. 288ff) and "civic skill"[5] (cf. pp. 304ff) as resources for participation. Using empirical evidence they conclude that civic skills heavily depend on education, which is not evenly distributed in the population.[6] They also compare skills required in a professional environment (giving presentations, formulating memos etc.) to skills needed in civic engagement, whether "conventional" or "unconventional" (following Barnes and Kasse [4]), such as (today's) social media, whereas unconventional may also refer to protests, boycotts etc [5]. A factor that may have a tendency to be underrated may be the skill to speak the language of the country of residence (and participation), which particularly applies to new immigrants as is pointed out by van Tubergen and Kalmijn [6]. However, Verba et al. focus on civic engagement in deliberative or consultative processes, it is difficult to see how these factors would influence voter turnout. The factor "time" (ultimately amounting to *availability* in this context) as advanced by Verba et al. however, could be important and will be tested against the data (see Questions 3.5 to 3.8 concerning postal voting, whether the polling station could be reached easily and whether respondents had time on election day).

Rosenstone and Hansen [7] offer an alternative model of voter participation[7], that of voter mobilisation. In this view, turnout decreases if voters do not feel their voice makes a difference or voters do not identify themselves with the entity that is conducting the election (eg, the region or municipality they live in). Summarizing (p. 228), they conclude that apart from the availability of resources, mobilisation is key to turnout. Mobilisation in turn works through (i) loyalty to parties or individual candidates, (ii) issues or (iii) opportunities perceived by the electorate.

These sources in the literature offer a comprehensive model for explaining voter turnout; however, a factor that is clearly decisive for the Neu-Ulm case does not feature prominently – migration and the resulting high "turnover" in the population, which appeared to be the decisive factor in the summary study in [1].

2.2 Identification with the City

Questions 1.5 – 1.8 were intended to check the degree to which the respondent identified with the home city. Question 1.5 (n=651 respondents) enquired about the intention to leave the city within the next five years. Only 5.6% answered in the affirmative, which appears rather low. However, 19.7% did not respond, leaving the question open. Only considering those who moved to Neu-Ulm 2007 or later (using Question 1.3, n=123/651 respondents) however showed 17.1% answering in the affirmative and 30.9% abstaining, only 52% out of that group did not voice an intention to move

[5] Defined as „the communications and organizational abilities that allow citizens to use time and money effectively in political life" (p. 304).

[6] They use their own tests for measuring language skills and relate it to the – heavily slanted – formal education levels of three population groups, Anglo-Whites, African Americans and Latinos. In contrast, the distribution between men and women is almost equal both in education levels and language skills (cf. Table 11.1 in [3]).

[7] They also stress the availability of time and resources (cf. p.12ff and – specific to elections – p. 133ff) stringently arguing via the onerous voter registration process in the U.S. (p. 230), but attach more importance to mobilisation effects asking themselves what mobilises an electorate.

from Neu-Ulm within the next five years. This would confirm the result of the analysis in [1] which came to a similar conclusion based on summary data.

Question 1.8 enquired about whether Neu-Ulm residents spent their work time in Neu-Ulm (only 30.1%)[8], their leisure time during the week (84.6%) and at the weekend (65.8%). This gives a remarkable picture in that the activity spread rather resembles a bedroom town, where people live and spend their leisure time but work somewhere else. This result is surprising because Neu-Ulm does have a university and several higher education institutions as well as a number of important employers. No indication was collected as to where respondents work but one can surmise that a substantial number of those 69.9% of the respondents who do not work in Neu-Ulm work in the neighbouring city of Ulm.

A key question was the identification with the city (Question 1.7, "I feel at home in my quarter, 6-point Likert scale). The distribution of responses is shown in Figure 3, three quarters of the respondents (values 1 and 2 on the scale) feel at home in Neu-Ulm. There is no significant difference in answers from German and non-German respondents.[9]

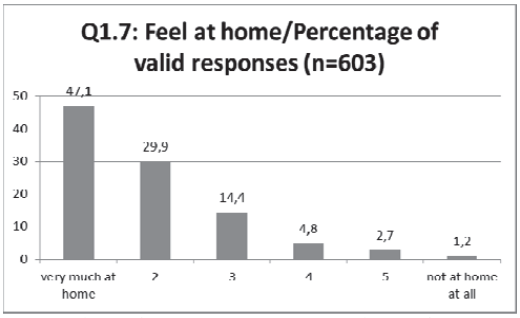


Figure 3: To what extent do residents feel at home in their quarter?

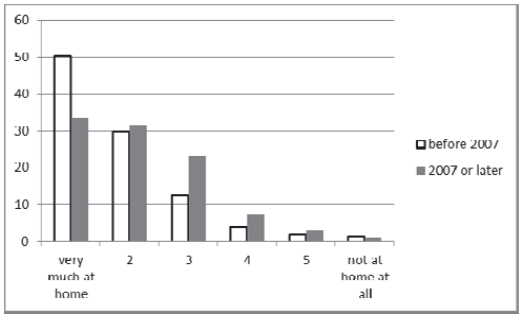


Figure 4: Q1.3xQ1.7: Duration of residence x Feel at (valid percentage, n=542)

As was the case in the summary data, the identification with the city increased significantly with the duration of residence, again without any significant difference in the effect between Germans and foreigners. Figure 4 again sets a cut point between residents since 2007 or earlier and maps these two groups against the "feel-at-home" categories from Figure 3. The difference is significant on a 99% level.

[8] One may object that retirees do not work anywhere, however the value for the respondents indicating an age of 18-60 is also only 36.5%.

[9] Caveat: Since a sub-representative fraction of foreigners responded (cf. Section 1.2), one may *surmise* that primarily the well-integrated foreigners responded. One may further surmise that once foreigners integrate and participate politically – for instance answer questionnaires from the Municipality – they identify with their city as well as the German population.

2.3 Declared Participation in Elections – Attitude

Questions 2.7 to 2.13 asked respondents whether they participated in various elections. It is clearly discernible to see that voter turnout as reported by far exceed the real one (Figure 5); the differences are of course statistically significant. Considering Figure 5, two explanations are possible: An over-declaration to give the socially "desired" answer[10] or a real bias in the respondents' sample. At this stage, the question cannot be answered.

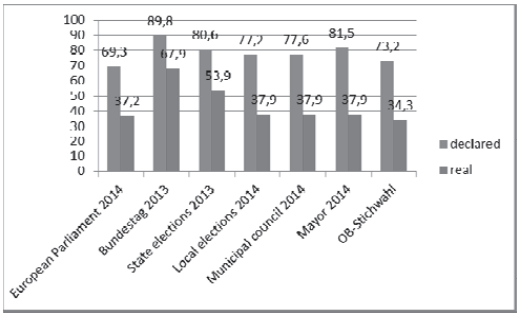


Figure 5: Declared and real turnout

Question	Agreement
3.1 I am not interested in these elections	11.2%
3.2 My vote does not change anything	13.8%
3.3 Billboards and pamphlets disturb me	25.1%
3.4 Neighbours/friends urge me to vote	3.7%
3.5 My polling station is easy to reach	86.4%
3.6 Postal voting is not for me	20.6%
3.7 I was not in Neu-Ulm on election day	20.3%
3.8 I had no time on election day	13.2%
3.9 Ballot sheets/elec.proc. easy to understand	60.3%
3.10 I always find the right candidate	36.6%
3.11 I collect info. extensively prior to elections	49.0%
3.12 I collect info. on current affairs in Neu-Ulm	60.6%
3.13 I attend civic events in Neu-Ulm	12.8%

Figure 6: Attitude towards elections (only main residents, Germans and foreigners)

The questions concerning the attitude of citizens towards elections in Figure 6 reveal an almost ideal state: Only a few respondents are not interested in elections or believe voting does not change anything, the polling station is believed to be close and only a fifth is not convinced by postal voting; people are interested in their local affairs. How could such a convinced and democratically active citizenry produce a voter turnout of one third? There are however some chords in minor: Two fifth do not understand the ballot sheet (well) and only one third finds the "right" candidate – in a sample, where by and large three quarters indicate to vote. Furthermore, there is a statistically strong relationship (significance level 99.9%) between (declared) voting and the answer to whether the respondent finds the right candidate (ie, participants rather tend to find the right candidate). This would indicate that the huge differences in Figure 5 are a real bias – not a socially motivated over-declaration.

The conclusion can only be that neither elections nor this questionnaire (nor presumably any other municipal political activity) has reached the disenfranchised, the frustrated or the (at least at this stage) non-voters. Whoever, whether established party or new-comer, manages to tap into this huge voter reservoir motivating the disenfranchised to go to elections, can potentially unleash a major political move.

[10] Note that data was collected via anonymous questionnaires and not in interviews.

3. Factors Influencing the Motivation to Vote

3.1 Method Used

In contrast to the summary analysis, individual data is available in this study to relate (declared) voting behaviour to the above factors in a meaningful way. The following constraints have to be met: (i) there is a dichotomous variable (declared voter/non-voter) influenced by some factors; (ii) a causal relationship rather than a mere correlation is required with the dichotomous variable as dependent; (iii) ordinal (possibly dichotomous) independent variables, no metric ones; (iv) a sample of approx. 800 and (v) a bias in some independents. To minimize statistical bias due to the low portion of foreigners in the sample, the following analyses are carried out for the German population only.

We selected a logistic regression with binary dependent [8]; For model refinement backward elimination was selected and the goodness of fit was tested according to Hosmer-Lemeshow [9]. The analysis was carried out in SPSS™. Several models were tested essentially confirming earlier results, such as the non-influence of age, the central importance of the residence time and the perceived importance of an election (the latter two both positively influencing turnout). We find that two models produce the most interesting results.

3.2 Factors Influencing Feeling at Home

The dependent was based on Question 1.7 (6-point Likert scale) in binary encoding (1 and 2 encoded as “feels at home”, 4 to 6 as “does not feel at home”). In this encoding, 76.6% of the respondents were ranked as “feels at home”. The independents selected were Questions 1.6 (children in Neu-Ulm, binary), Question 1.8 (spending work time, leisure during the week and at weekends in Neu-Ulm, all three binary) and again age and duration of residence.

The test was run in a four-stage backward elimination and the last iteration produced a very good goodness of fit (57.7%). The iterations are shown in the original output in Figure 7 (in German). Three variables remained in the final model: Children in the city (KINDER), duration of residence (binary encoded before and from 2007, LEBTSEIT_BINAER) and age (ALTER). Both leisure and the work place variables were eliminated. Above all, the amount of leisure time spent in the city - which is rather high (see 2.2) – does not influence the feeling at home. Backward elimination was stopped at 0.05.

The leisure time spent in the city – which is substantially more than work time – obviously does not create a stronger link to the city. This is remarkable and may point to deficiencies in this regard. Apart from duration of residence and (closely related) age, it is only the fact that the respondent has children in the city that determines the feeling to be at home.

Modellieren, wenn Term entfernt

Variable		Log-Likelihood des Modells	Änderung der -2 Log-Likelihood	df	Signifikanz der Änderung
Schritt 1	KINDER	-233,457	9,028	1	,003
	AZ_IN_NEUULM	-229,061	,238	1	,626
	FZ_IN_NEUULM	-229,010	,134	1	,714
	WE_IN_NEUULM	-228,988	,090	1	,764
	LEBTSEIT_BINAER	-231,425	4,965	1	,026
	ALTER	-245,817	33,750	4	,000
Schritt 2	KINDER	-233,475	8,974	1	,003
	AZ_IN_NEUULM	-229,143	,310	1	,577
	FZ_IN_NEUULM	-229,033	,091	1	,763
	LEBTSEIT_BINAER	-231,526	5,076	1	,024
	ALTER	-245,818	33,661	4	,000
Schritt 3	KINDER	-233,517	8,967	1	,003
	AZ_IN_NEUULM	-229,174	,283	1	,595
	LEBTSEIT_BINAER	-231,550	5,034	1	,025
	ALTER	-246,586	35,105	4	,000
Schritt 4	KINDER	-233,540	8,732	1	,003
	LEBTSEIT_BINAER	-231,962	5,576	1	,018
	ALTER	-253,454	48,560	4	,000

Figure 7: Backward elimination, influence on "feel-at-home"

3.3 Factors Influencing Turnout

Exploring the (declared) participation in the last municipal election 2014 (Question 2.11, n=747 valid responses, 78.4% voted, German main residents only), several models are possible and were tested. In the following we would like to present the model we believe to provide the highest explanatory power. The independents selected were

- The duration of residence (binary before and from 2007, LEBTSEIT_BINAER);
- "My vote does not change anything (binary, AENDERT NICHTS);
- "I always find the right candidate" (binary, KANDIDAT);
- Kids in Neu-Ulm (binary, KINDER);
- "Polling station not easily reachable" (binary, LOKALNICHTERREICHBAR);
- "Postal voting is not for me (binary, BRIEFWAHLNICHTS);
- "I feel at home in Neu-Ulm" (binary, ZUHAUSE_BINAER);

Age and other variables were not included, as they already showed to have low explanatory power of voting behaviour. Again the backward elimination procedure was stopped at 0.05. Figure 8 shows the backward elimination of the model, the Hosmer-Lemeshow test yielded 69.5% at the final stage, which is a fair goodness of fit. The result is revealing. Children in town, the feeling at home, even the duration of residence which was highly significant in the summary analysis and the bilateral tests with voter participation were all excluded.

The feeling that the vote does not change anything and the lack of a suitable candidate were the main drivers of the voter participation (negative, ie, higher feeling of disenfranchisement leads to lower probability of participation). Only reluctance to use postal voting did make it to the last batch of variables. However, one may note that the duration of residence was cut only in the last step.

Modellieren, wenn Term entfernt

Variable		Log-Likelihood des Modells	Änderung der -2 Log-Likelihood	df	Signifikanz der Änderung
Schritt 1	LEBTSEIT_BINAER	-162,373	1,543	1	,214
	AENDERT_NICHTS	-176,002	28,800	1	,000
	KANDIDAT	-170,865	18,526	1	,000
	KINDER	-162,303	1,402	1	,236
	LOKALNICHTERREICHBAR	-161,635	,066	1	,797
	BRIEFWAHLNICHTS	-163,849	4,494	1	,034
	ZUHAUSE_BINAER	-162,672	2,140	1	,144
Schritt 2	LEBTSEIT_BINAER	-162,384	1,499	1	,221
	AENDERT_NICHTS	-176,347	29,424	1	,000
	KANDIDAT	-171,622	19,975	1	,000
	KINDER	-162,345	1,420	1	,233
	BRIEFWAHLNICHTS	-163,861	4,453	1	,035
	ZUHAUSE_BINAER	-162,695	2,120	1	,145
Schritt 3	LEBTSEIT_BINAER	-163,528	2,367	1	,124
	AENDERT_NICHTS	-177,720	30,749	1	,000
	KANDIDAT	-172,076	19,461	1	,000
	BRIEFWAHLNICHTS	-164,581	4,473	1	,034
	ZUHAUSE_BINAER	-163,210	1,731	1	,188
Schritt 4	LEBTSEIT_BINAER	-163,961	1,501	1	,220
	AENDERT_NICHTS	-178,643	30,865	1	,000
	KANDIDAT	-173,547	20,673	1	,000
	BRIEFWAHLNICHTS	-165,298	4,176	1	,041
Schritt 5	AENDERT_NICHTS	-186,527	45,132	1	,000
	KANDIDAT	-173,572	19,222	1	,000
	BRIEFWAHLNICHTS	-166,856	5,789	1	,016

Figure 8: Backward elimination, general model

However, the fact that the feeling at home variable was eliminated as well raises the question, whether this is something specific to Neu-Ulm and its political environment or a general problem. To test this, the same model was run with the (declared) participation in the Bundestag Election 2013. The Hosmer-Lemeshow value indicates a rather limited goodness of fit, 0.89. However, under that caveat, the model yields a result very similar to the previous model with participation in the municipal elections 2014 as dependent: After a six-step elimination process, AENDERT_NICHTS and BRIEFWAHLNICHTS remain in the model, with significance levels of 0.000 and 0.047, resp. (for space constraints depiction of the elimination process is omitted here). The lack of a suitable candidate (KANDIDAT) is not in the final model on the federal level (understandable, as the suitability of local election candidates will hardly play a role in federal turnout). Again the feeling at home (in Neu-Ulm) was not in the final model (eliminated in Step 4). It needs to be re-emphasised that – due to the low portion of foreigners in the sample – the analyses in Section 3 were carried out among Germans only.

This result enables one to conclude that the political disenfranchisement *does* influence the municipal turnout – however *said disenfranchisement is not limited to the municipality*. It is rather a general influencing factor that drives down turnout. Hence, it remains to be determined how far activating measures taken *on the municipal level* do actually increase turnout in the face of a clearly

general disenfranchisement. The general results would support both Rosenstone and Hansen [7] in that mobilization is key as well as Verba et al. [3] in their resource-based view on turnout concerning postal voting.

4. Summary

From the statistical findings one may conclude:

- More attention could be paid to the specificities of EU foreigners (who are allowed to vote on the municipal elections), maybe to include EU foreigners to the major party lists; there is however *no significant relationship* between the property EU foreigner and "I always find the right candidate".

- The models in Section 3.3 tell a story of general political disenfranchisement as a main driver of voter (non-)participation; it remains doubtful, whether measures on the municipal level can change this general feeling. The results in Section 2.3 show that there is a large portion of non-voters, who once activated, may trigger major political change.

- The high fluctuation of (German!) residents is another main driver of low turnout which was shown both in the summary analysis in [1] and the individual questionnaire data; it crucially influences the feeling at home and – at least in the summary analysis – shows a high correlation with turnout.

Out of these three factors, two are difficult to "fix" on the municipal level. Neither can a general alienation to politics be fixed on the municipal level; nor can the high fluctuation in the town population, which it is rooted in the structure of the city (twin city with Ulm, highly active economy and educational institutions implying fluctuations in resident students). Hence, the options of the Municipality to address these issues unfortunately appear limited.

5. References

Web addresses checked as per March 28, 2017.

[1] BULLINGER, A., PROSSER, A. and SCHENK, B.: Reasons for Low Voter Turnout - An Empirical Case Study in Neu-Ulm. In CEE e|Dem and e|Gov Days 2016, Hrsg. Alexander Balthasar, et al.: Budapest: OCG, 2016, pp. 579-588.

[2] KANUK, L. and BERENSON, C.: Mail Surveys and Response Rates: A Literature Review, Journal of Marketing Research Vol. 12, No. 4 (Nov., 1975), pp. 440-453, download from http://www.jstor.org/stable/3151093.

[3] VERBA, S. SCHLOZMANN, K.L. and BRADY, H.E.: Voice and Equality – Civic Voluntarism in American Politics, Harvard University Press, 1995.

[4] BARNES, S. H. and KASSE, M.: Political Action: Mass Participation in Five Western Democracies, Sage Publications, 1979.

[5] NORRIS, P.: Conclusions: the growth of critical citizens and its consequences. In Norris, P. (Ed.), Critical Citizens: Global Support for Democratic Governance, Oxford University Press, 1999, pp. 257–272.

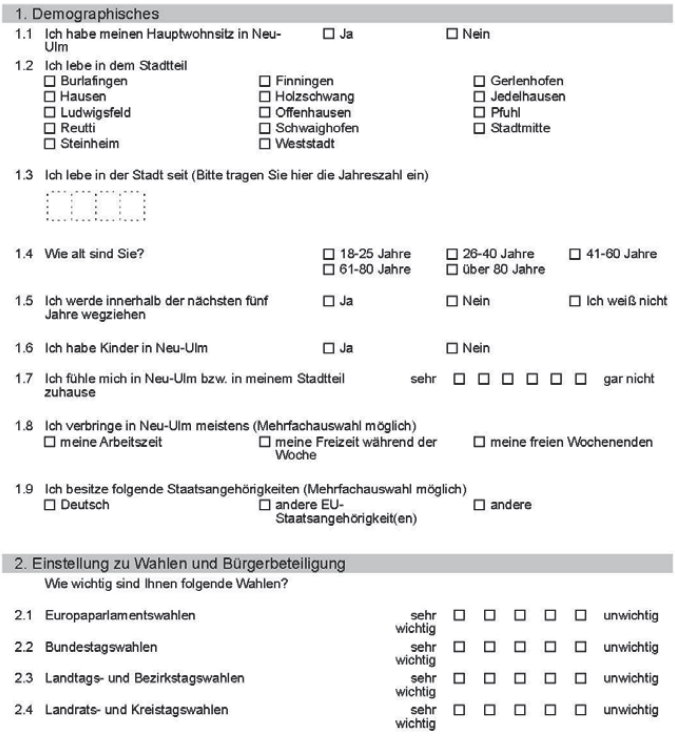
[6] VAN TUBERGEN, F. and KALMIJN, M.: Destination-language proficiency in cross-national perspective: a study of immigrant groups in nine Western countries, American Journal of Sociology, 110, 2005, pp. 1412–1457.

[7] ROSENSTONE, S.J. and HANSEN, J.M.: Mobilization, participation, and American democracy, MacMillan, 1993.

[8] ANDRESZ, H.-J., HAGENAARS, J.A. and KÜHNEL, S.: Analyse von Tabellen und kategorialen Daten, Springer, Berlin et al, 1997, S. 262ff.

[9] HOSMER, D.W. and LEMESHOW, S.: Applied Logistic Regression, Wiley, New York, 2013.

6. Annex: Questionnaire



1. Demographisches

1.1 Ich habe meinen Hauptwohnsitz in Neu-Ulm ☐ Ja ☐ Nein

1.2 Ich lebe in dem Stadtteil

☐ Burlafingen ☐ Finningen ☐ Gerlenhofen
☐ Hausen ☐ Holzschwang ☐ Jedelhausen
☐ Ludwigsfeld ☐ Offenhausen ☐ Pfuhl
☐ Reutti ☐ Schwaighofen ☐ Stadtmitte
☐ Steinheim ☐ Weststadt

1.3 Ich lebe in der Stadt seit (Bitte tragen Sie hier die Jahreszahl ein)

1.4 Wie alt sind Sie? ☐ 18-25 Jahre ☐ 26-40 Jahre ☐ 41-60 Jahre ☐ 61-80 Jahre ☐ über 80 Jahre

1.5 Ich werde innerhalb der nächsten fünf Jahre wegziehen ☐ Ja ☐ Nein ☐ Ich weiß nicht

1.6 Ich habe Kinder in Neu-Ulm ☐ Ja ☐ Nein

1.7 Ich fühle mich in Neu-Ulm bzw. in meinem Stadtteil zuhause sehr ☐ ☐ ☐ ☐ ☐ ☐ gar nicht

1.8 Ich verbringe in Neu-Ulm meistens (Mehrfachauswahl möglich)
☐ meine Arbeitszeit ☐ meine Freizeit während der Woche ☐ meine freien Wochenenden

1.9 Ich besitze folgende Staatsangehörigkeiten (Mehrfachauswahl möglich)
☐ Deutsch ☐ andere EU-Staatsangehörigkeit(en) ☐ andere

2. Einstellung zu Wahlen und Bürgerbeteiligung

Wie wichtig sind Ihnen folgende Wahlen?

2.1 Europaparlamentswahlen sehr wichtig ☐ ☐ ☐ ☐ ☐ unwichtig

2.2 Bundestagswahlen sehr wichtig ☐ ☐ ☐ ☐ ☐ unwichtig

2.3 Landtags- und Bezirkstagswahlen sehr wichtig ☐ ☐ ☐ ☐ ☐ unwichtig

2.4 Landrats- und Kreistagswahlen sehr wichtig ☐ ☐ ☐ ☐ ☐ unwichtig

2. Einstellung zu Wahlen und Bürgerbeteiligung [Fortsetzung]

2.5	Stadtratswahlen	sehr wichtig	☐	☐	☐	☐	☐	unwichtig
2.6	Oberbürgermeisterwahlen	sehr wichtig	☐	☐	☐	☐	☐	unwichtig

Haben Sie an folgenden Wahlen in Neu-Ulm teilgenommen?

2.7	Europaparlamentswahlen 2014	☐ Ja	☐ Nein
2.8	Bundestagswahlen 2013	☐ Ja	☐ Nein
2.9	Landtags- und Bezirkstagswahlen 2013	☐ Ja	☐ Nein
2.10	Landrats- und Kreistagswahlen 2014	☐ Ja	☐ Nein
2.11	Stadtratswahlen 2014	☐ Ja	☐ Nein
2.12	OBM-Wahl 2014 - 1. Wahlgang	☐ Ja	☐ Nein
2.13	OBM-Wahl 2014 - Stichwahl	☐ Ja	☐ Nein

3. Kommunalwahlen in Neu-Ulm

(Oberbürgermeister, Stadtrat, Landrat und Kreistag)

3.1	Mich interessieren diese Wahlen nicht	trifft zu	☐	☐	☐	☐	☐	☐	trifft nicht zu
3.2	Meine Stimme ändert nichts	trifft zu	☐	☐	☐	☐	☐	☐	trifft nicht zu
3.3	Wahlplakate und Werbematerial stören mich	trifft zu	☐	☐	☐	☐	☐	☐	trifft nicht zu
3.4	Nachbarn, Freunde usw. drängen mich dazu, wählen zu gehen	trifft zu	☐	☐	☐	☐	☐	☐	trifft nicht zu
3.5	Mein Wahllokal ist für mich leicht erreichbar	trifft zu	☐	☐	☐	☐	☐	☐	trifft nicht zu
3.6	Briefwahl ist für mich nichts	trifft zu	☐	☐	☐	☐	☐	☐	trifft nicht zu
3.7	Ich war an Wahltagen nicht in Neu-Ulm	trifft zu	☐	☐	☐	☐	☐	☐	trifft nicht zu
3.8	Ich hatte an Wahltagen keine Zeit	trifft zu	☐	☐	☐	☐	☐	☐	trifft nicht zu
3.9	Stimmzettel und Wahlverfahren sind einfach zu verstehen	trifft zu	☐	☐	☐	☐	☐	☐	trifft nicht zu
3.10	Ich finde immer den richtigen Kandidaten für mich	trifft zu	☐	☐	☐	☐	☐	☐	trifft nicht zu
3.11	Ich informiere mich vor jeder Wahl ausführlich	trifft zu	☐	☐	☐	☐	☐	☐	trifft nicht zu
3.12	Ich informiere mich über aktuelle Themen in Neu-Ulm	trifft zu	☐	☐	☐	☐	☐	☐	trifft nicht zu
3.13	Ich gehe zu Bürgerveranstaltungen in Neu-Ulm (Bürgerversammlungen, Bürgersprechstunde)	trifft zu	☐	☐	☐	☐	☐	☐	trifft nicht zu

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