

# LEARNING TO TRANSFORM BY IMPLEMENTING AI INTO ADMINISTRATIVE DECISIONS – DISRUPTIVE MINDSET AS THE KEY FOR AGILITY IN THE CRISIS

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## **Abstract**

*The Objectives of the research paper are investigations in how a disruptive Mindset can have effects on interaction by representatives of German Authorities in times of crisis. The interdisciplinary focus of human transformative learning maybe sets linking options to machine learning approaches to speed up qualified decision making. The Approach is in addition to an introduction of implementation strategies for AI technology in the local governance of German Municipalities, what competencies of persons in charge are required to get use of technological possibilities. In this respect, the investigation bases on findings of three studies in field of “scenarios for AI in the public sector”, “AI as impact on competencies in the field of corporate finance” and “competencies in a digitalized working environment”. The Results concern the understanding what preconditions for human and AI-oriented learning systems are necessary in suitable scenarios of public sector performance. Also, convergent competence structures, based on transformative learning theories, should show a way for implementation based on models for interaction in critical situations. The Value of the paper lies in the combined View of administrative requirements in relation to learning-strategies considering technological scenarios of AI for professionalize the decision-making processes in times of Covid-19 pandemic crises.*

## **1. Introduction**

One of the main challenges of the current Covid crisis in Germany and Europe, as well as the continuation in the coming years, will be to reach an understanding of process automation and the use of AI in the public sector. The network age requires ‘future skills’ from employees to implement the level of efficiency in the regular operation of standardized and automated service provision in everyday life. How can this succeed?

## **2. Situation**

The basic mindset of public administration should include openness, innovation, solidarity, and agility aiming at a user-centered service orientation. The scenarios of implementing change management should not only focus internal structures and processes, but also innovation design in external services. Digital transformation requires an iterative culture for strategic model development (see Brandes et al., 2014).

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It is precisely the spirit of disruption in crisis mode developed from various sample projects that opens an entry point for iterative loops of organizational learning, which should be permanently established for the necessary creation of ideas for the digital revolution. These lighthouses require stabilization, which can be created through frameworks and legal experimentation clauses.

In addition to legal and political hurdles, barriers within administrative institutions must also be overcome to achieve results of added value for society. In the context of the implementation of public law in Germany regarding the question of full automation of administrative decisions, various legal issues come into focus. Unification across the federal state is particularly important in the Federal Republic of Germany. The German government landscape is characterized by different powers of the federal states regarding requirements in the EGovernment or autonomous rights of the municipalities in municipal economy. This often results in different speeds in the implementation of digital advances and priorities. Regional pilot communities are often positioned far ahead of national standards in areas of innovative services. However, for most government agencies, despite the level of administration, there are major challenges in process optimization and automation. The distinctly small-scale landscape of public authorities can only be overcome with the most consistent standards of legal prerequisites and organizational implementation concepts as possible.

The European Union has also recognized this and has considered the perspective of the authority of values and morality for Europe. Europe-wide ethical guidelines for the development and use of AI technologies (see European Commission, 2020) will be used to develop a manageable AI strategy in the member states based on these three pillars:

- 1) Research and Development,
- 2) Social and
- 3) Education.

The German Government has already established an AI strategy for Germany, whereby concrete rules for action and design requirements for the authorities have yet to be established (see BMBF, 2018).

Intelligently networked cyberphysical systems also require clarification of regulatory and ethical issues for acceptance management. Clear deployment scenarios, transparent impact chains and efficiency gains compared to conventional task performance must be communicated to convince decision-makers in the public sector. In addition to the abstract regulations in ethics and legal design at national level, professional development projects of the implementation of technology have always to be related to the design of application scenarios to related business processes on site. No blanket guidelines or checklists can be applied here.

The Algo.Rules (2019) provide an example of a model catalogue of formal criteria for the socially beneficial design of algorithmic systems. They consider a framework with the following aspects to be essential to smooth the scenario of the ‘constructive combination of human and artificial intelligence’:

- Building skills in the workforce: The functioning and possible effects of an algorithmic system need to be understood.
- Defining responsibility: A natural or legal person has always to be responsible for the effects of using an algorithmic system.
- Document ingenuities and expected impact: Comprehensible documentation must be made available to everybody before use.

- Ensuring security: Mechanisms to secure an algorithmic system must be established and continuously guaranteed.
- Labeling: The use of an algorithmic system must be made transparent.
- Ensuring traceability: The decision-making of an algorithmic system has always to be comprehensible.
- Ensure control: An algorithmic system must be and remain manageable throughout its use.
- Review impact: The impact and autonomous decision-making of an algorithmic system must be reviewed regularly.
- Allow complaints: Questionable decisions of an algorithmic system that affect the rights of a data subject must be able to be explained and reported.

Rather, dimensions such as the acceptance and standing of innovation, organizational structure, information forwarding and documentation, and key figures on service standards are to be surveyed via methodical processing. Transformation in this form can be achieved via qualified pilots with strong methodological expertise in agile frameworks and New Work values (see Schachtner, 2019).

### 3. Theoretical Framework

To be able to professionalize service in order of social transformation through agile decisions, the concept of absorptive capacity generates advice on an abstract level. The importance of innovation in sustainable systems is included in the perspective of ‘absorptive’ as ability of an organization to absorb new external knowledge and combine it with internal knowledge (see Cohen & Levinthal, 1990). This requires using assimilated knowledge in a value-creating cycle of continuously expanding proactive-strategic effect.

Linking options of established learning theories of adult education in relation to deep-learning approaches of artificial intelligence basic technologies can be derived from the consideration of Todorova & Durisin (2007), which refer to cognitive research, according to which new knowledge can be built up even if there is no connection to existing structures.

With neural networks of adult learning, common perspectives can thus be found in reinforcement learning, where algorithms must make decisions weighing up the consequences, as well as supervised and unsupervised learning self-sufficiently leads to further development of the reflective ability (see Illeris, 2009)

Aufgrund der Schwerpunktsetzung dieses Beitrags wird an dieser Stelle nicht weiter auf Konzepte des Lernens wie „Transformative Learning“ (see Mezirow, 2003) oder „Communities of Practice“ (see Wenger, 1998).

To increase their maturity towards an innovative and forward-looking organization many government institutions support organisational learning (see Schreyögg & Duchek, 2010). To activate the process of optimization on site in the organizational units, potential assessments have a dimension of ethical regulation and reducing barriers for innovation due to personal consideration of individual benefits. So-called ‘change agents’, a role in cross-functional project teams, can help to achieve progress in new forms of work (Bateson 1972).

### 4. Research Design

Secondary evaluations will provide a framework for analytical engagement with research- or theory-based evidence in the field of andragogy and the psychology of learning in the public sector field. Through the concept of competence derived from the educational sciences, forward-looking planning, situational control, and socially relevant expansion can be expressed in different fields of application, which can be developed accordingly when using learning theories.

#### 4.1. Research Question

Essentially, the following research questions will be answered, combined with the corresponding hypotheses (H0-H2):

1. What are the barriers and risks associated with the use of artificial intelligence for acceptance reasons, legal or ethical considerations?  
*H0: Human expectations regarding the use of AI are currently divided. Fixed regulations and transparency of the efficiency of AI with defined application scenarios help to develop an openness to algorithm-based systems.*
2. What are user scenarios of AI for public administration?  
*H1: AI can be used in the Everyday life, the world of work in production and service as well as in continuing education and training. The degree of complexity ranges from routine processes to future forecasting based on existing decision documentation.*
3. What are possible suggestions to implement a strategy of rise competencies among the staff?  
*H2: The acceptance of digital transformation can be promoted through the development of competences of the administrative staff. Top-Management is in demand to establish a culture of design and reflection of optimization approaches. AI can be used for various specialist procedures or activities at any functional level, but support on implementation by internal project managers is necessary.*

#### 4.2. Methodology

To obtain an increase in complementarity to the exploratory research subject of digitization in the field of public administration, the methodology includes a mixed method approach with several surveys. To collect data, three different empirical methods were used: an expert questionnaire, an online Delphi, and a foresight method. So, the secondary data analysis from the method triangulation was fulfilled in parallel design with different focus orientations. The qualitative surveys on competencies and future scenarios were combined in the interpretation of the results (see Kuckartz, 2014).

The following overview intends to show the focus of the studies, the methodical setting, and the expected value for the research questions:

1. **Reinhardt et. al. (2018) ‘AI as impact on competencies in the field of corporate finance’:** The study examines a shift to jobs and roles in financial management through the effects of artificial intelligence applications. 164 financial management experts from Germany, the USA, Asia, and Switzerland were questioned. The standardized questionnaire survey was carried out in a qualitatively oriented way based on 184 path-dependent questions. The focus of the question on each role and function was the development of activities and competences related to the use of AI.
2. **Opiela et al. (2018) ‘EXEKUTIVE AI 2030 - Four scenarios for the use of AI in public administration’:** Four future scenarios and development possibilities of AI to public

administration to be set up until 2030 have been developed by an interdisciplinary team of experts of the Competence Center for Public IT via a Foresight approach. In particular, the human-machine interactions regarding work organization and decision-making processes have been studied in relation to classic administrative actions.

3. **Münchener Kreis (2020) 'Living, Work, Education 2035+'**: Through an online expert Delphi (two-stage expert survey with prior registration of national and international experts), the systemic interplay of life, work, and education through the design of AI applications was queried. Particularly the education sector is of increased importance in bringing about a change in (educational) society due to modified professional requirements of new activity profiles.

### 4.3. Results and Value

The strategic capability and competence perspective for digital transformation among the responsible decision-makers and project managers has focused on the study on the influence of AI on competences in corporate finance (Reinhardt et. al., 2018). A high degree of consistency can be assumed to be consistent with similar competency requirements in core processes in terms of AI's potential in optimizing business processes or intelligently predicting decision-making options. More complex cognitive processes for analyzing patterns in document processing, using neural networks by using predictive analytics applications to create dynamic forecasts and report on future demand developments, plus assessing risks or compliance violations by examining unstructured data sources using RPA technology.

The maximum exploitation of potential is becoming increasingly important and therefore requires competence management with the fusion of human and technological capabilities through convergent competence structures (see Reinhardt, 2019). This also goes hand in hand with the design of innovative business models for the public administration with its own data models (also in cooperation with, for example, industrial partners and start-ups), modern work structures with the result of changed occupational profiles. In the future, human beings as knowledge carriers will continue to be the decisive basis for successful service delivery but can only be thought of in combination of human and humanoid skill development through the training of effective methods and applications. Results from the research show that substituting human potential and a build-up of convergent competence structures is necessary to work together with the AI on problem solutions to be targeted according to the respective performance advantage.

The study on changes in competence structures foresees the long-term reduction of functional roles, such as that of the accountant, but strengthens the need for human analytical competence in professional profiles such as the financial controller or the auditor. At the same time, AI as an incubator will ensure that new job profiles are created or become more important, such as the Data Scientist, the Treasury Consultant, or the Trusted Business Advisor.

As the study by the Competence Center for Public IT of Opiela et al (2018) shows, concrete scenarios for an AI-influenced future up to 2030 are already available in public administration.

Mandatory employment must also be subject to ethical issues, so that confidence-building standards, certifications or quality controls can also be controlled - if necessary, by the courts - of the assured traceability of self-sufficient AI decisions.

To create a cultural change to human-machine interaction, it is a good opportunity to clarify the similarities in the processing of information. The concept of absorptive capacity can help to enter a higher level of reflection of one's own actions and to introduce learning loops up to Deutero-learning. In addition, a heterogeneous set of traditional and innovative instruments, combined with a consistent and unreserved critique of tasks, need to be introduced to preserve values of the current, network-oriented world of work.

In the “Münchner Kreis” study on the future (2020), the links between the effects and potentials of AI on areas of everyday life, the world of work, and education are considered holistically. Therefore, the essential area findings will be presented in isolation.

Area of everyday life:

On the part of the experts, negative tendencies of AI technologies in general areas of life are attributed a low impact. Nevertheless, (inter-)nationally fixed standards for interdisciplinary use cases are to be issued by means of guidelines. The experts believe that legal certainty for all citizens can only be guaranteed if the degree of maturity of the automation potential, systematic user-centeredness, comprehensive transparency, verifiable procedures for data refinement, and the ethical framework parameters for creating neutral training data sets to avoid bias mechanisms are auditable and disclosed. Digital sovereignty is to take a step forward by standardizing test criteria.

The world of work:

Before AI technologies are deployed, rules must be anchored in employment law. Based on these legal foundations, organizations must find internal agreements together with staff committee to concretize the intra-organizational daily work with AI technologies. The importance of human competence in contrast to AI technologies needs increasing transparency and new evaluation criteria of work performance. The core insight must be that human intellectual strengths are complemented, but not replaced, by the potential of AI technology. Particularly, this holds true with respect to the use of AI-based algorithms as part of team achievements in complete chains of action of business processes.

Education:

In the experts' view, educational concepts must be more interdisciplinary and transdisciplinary, so that AI cannot be a technological topic alone. Other disciplines such as pedagogy, psychology, or organizational studies offer opportunities to increase innovation in creative work. Individual development of human strengths in interaction with AI generally need to be incorporated into university curricula in a timely manner, as well as adult education in the corporate context. This also entails a change in job profiles in workplace learning, where specific competencies of employees to design new contexts in the use of AI appear central.

## 5. Conclusion

The above statements make clear that politics and society are currently in the process of developing a common picture of desired use scenarios for AI technology. Interactions of conflicting goals and contradictions with human expectations in the work concept must be recorded and discussed.

Fixed regulations and transparency with test access about the mode of action of AI as well as competence building can be the basis for promoting acceptance and a positive image of the interaction between humans and machines. The importance of regulation, development and education needs in AI mode can thus represent as key to the prosperity of society. At the same time, the speed of implementation is essential for Germany and Europe in a globalized world in competition with other nations.

In this respect, similar and other occupational profiles, such as those in the field of legal tech in public administration, are also conceivable. The acceptance and design of the challenges posed by digital transformation go hand in hand with the pre-emptive development of competences and must therefore be tackled by the top management. A culture of questioning, evaluating, and reflecting value propositions needs to be developed. At the same time, this vision must be translated for different target groups and needs to be communicated, accompanied, and implemented into identifiable criteria of achievement and, thus, the requirements at each functional level.

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