# PUBLIC FINANCING BEYOND PARTICIPATORY BUDGETING: THE QUANTUM BUDGET

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***Abstract***
*The idea of so-called "Participatory Budgeting" (PB) has recently re-entered the modern political discourse. Major metropoles, such as New York, are making progress beyond mere piloting by paving the road for mandatory PB with new legislation, while communities of various sizes and politicians of various ranks all around the world aim to follow suit in an attempt to maintain an image of democratic progress. This paper shall scrutinize PB and provide a critique of PB from the perspective of democratic innovation. Another concept for increasing democratic power of citizens shall be described – the Quantum Budget. The Quantum Budget is an innovative way of funding communal projects that bases on Liquid Democracy. The paper will compare the Quantum Budget to Participatory Budgeting and provide a discussion on their potentials and weaknesses.*

## 1. Introduction

The 20th century brought humanity new technologies in form of electronics (programmable hardware systems), informatics (the art of structuring and processing information by means of software), and electronic telecommunications – the art of transmitting information by means of the combined power of electronics and informatics. This new knowledge how to utilize the electron to serve humanity enabled the emergence of cyberspace as a new dimension for human interaction and as such unleashed unprecedented transformations in domains such as business, logistics, navigation, social interaction, etc. Business-to-business sales and consumer-level mail orders are today mainly conducted online, road maps have given way to interactive GPS navigation systems, romantic partners are sought in cyberspace, and so on.

However, in the context of governing society – that is, managing the common good, provisioning of public services, etc., the flows of work and ways of conduct remain largely the same as they've been for past generations. The power to rule over a society is still entrusted to elected representatives, as it has been before; public services are still provided by governmental institutions that are funded through a system of public financing; and this system of public financing is still run by a machine of elected representatives and professional agents that exact taxes from tax payers in order to transfer them to privileged beneficiaries. In short, all governance is mediated by the bureaucracy.

Several ideas have emerged to modernize societal governance by leveraging the possibilities brought by electronic computing and informatics. Efforts to modernize societal governance are mainly focussed on the digitalization of channels for interaction between citizens and government

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agencies [11] (e.g. online tax returns) or automated exchange of structured and unstructured data between government agencies. To foster democratic participation and transparency of government action, initiatives emerged to make government data available online for public use [10]. These ideas however face the critique that they don't leverage the full potentials of 20th century technologies to transform societal governance to become more democratic [6].

Ideas to make societal governance more democratic deal with the question how levied taxes are spent for the common good. One such idea is the Participatory Budgeting (PB), another is the Quantum Budget (QB). Both ideas aim to increase the power of citizens in deciding how public money is spent. This paper shall compare both ideas / concepts and shall aim to answer following research question: What is the transformational potential of each idea on the existing culture of public governance and politics?

To answer this research question, the paper shall first provide a description of each of the ideas in section 2. Section 3 shall provide a discussion of both concepts in comparison with each other. Section 4 shall conclude with a summary.

## 2. Involving Citizens: The Concepts

Ideas to increase citizen involvement in public governance can take two possible directions: they can envision citizens to take direct action without government intervention / moderation, or they can rely on consulting citizens on relevant matters and allowing them to participate in processes that would be otherwise handled entirely by professional government agents. Crowd-funded civil infrastructure such as road repairs (O'Reilly reports the example of a self-organized road repair job in Hawaii, where business owners themselves raised the funds to repair a local street within days instead of waiting several years for government to do it [5]) would be an example how citizens can take independent action in matters of public interest, while the consultation of citizens on planned urban development projects would be an example how citizens are offered a platform to participate (being heard, having a say) in such matters.

In the domain of public funding, notable ideas to increase citizen involvement are Participatory Budgeting (PB), which takes the participative approach, and Quantum Budget (QB), which aims to act as a tool for taking direct action. This section shall briefly describe each of them.

### 2.1. Participatory Budgeting

Participatory Budgeting (PB) is about enabling citizens to have a say in allocating a community's budget to community projects. The idea was popularized during the 1980s by the Brazilian Workers' Party, who succeeded in implementing PB in Porto Alegre in 1989. Following this successful implementation, the model spread rapidly to other cities in Brazil, and was later adopted in cities and municipalities throughout the world.

What characterizes PB is the moderated involvement of citizens in a process that starts with a search for ideas and results in some of the identified ideas being funded by the government. Accordingly, citizens are invited to submit ideas for projects to be funded, such as new schools, sewage systems, etc. Typically, a team of volunteers would be sourced from within the participants, who would then refine the collected ideas and moderate a process that involves voting on the refined ideas. "Elected" ideas would be finally delegated to the government to fund and realize them.

### 2.2. Quantum Budget

The Quantum Budget (QB) is the application of liquid democratic decision-making to public financing. The idea is novel and has not yet been applied to real-world situations. The idea as such has been first described in the book *Smart City Governance* [7] where it has been proposed as a non-mediated way of funding common projects / programmes / activities by a community. More specifically, this means that instead of decisions regarding public funding being the concern of representative or executive institutions such as parliaments or ministries, such decisions are conducted by all citizens collectively in a liquid democratic fashion.

To understand the Quantum Budget, one must have first an understanding of liquid democratic decision-making – or Liquid Democracy (LD) for short. In LD, a community makes decisions on common matters such as laws and regulations, mandates given to individuals and organisations, etc., through a network of societal power that comprises all individual members of the respective community [9]. Each member of the community has a specific share of societal power (this share can be equal, or weighted by some criteria chosen by the community), which it can delegate to other members of the community at any time. If a member of the community delegates its power to another member, then also any power which that member has received, will be delegated further. Any delegation of power can at any time be revoked, which makes the network liquid – at any moment, the distribution of societal power can change. This way, some members of the community will bundle enough power to act as ad-hoc representatives of the community in situations when a communal decision has to be made.

QB bases on the principles of LD; however, instead of delegating abstract power, funds (money) are delegated throughout the network. Accordingly, strong nodes in the network would be able to accumulate sufficient amounts of money to fund public projects / programs / initiatives. Building and maintaining communal infrastructure (roads, public transport, hospitals, schools, etc.), the provisioning of public services (public schooling, public health, law enforcement, etc.) can thus be organized and handled by individuals or organizations able to bundle the required amount of funding.

Instead of taxes being taken away from the members of the community through exaction by institutions such as tax administrations, contributions owed to the community remain in the possession of each member, but they cannot spend them for their own needs. The sum of all contributions is called the Virtual Communal Fund (VCF). Each member of the community controls a given share of the VCF – this could be for example an equal share of the whole VCF, or a share corresponding to their particular contribution to the VCF; such share of the VCF is called a *quantum* (Greek for part / share – this is where the Quantum Budget gets its name from). A member of the community can then delegate their quantum further or use it to finance public projects / programs / etc.

## 3. Quantum Budget in Comparison with Participative Budgeting

Participative Budgeting (PB) is a well-known concept that has been applied in many cities around the world over a time span of several decades. Thus, since late 1980s scientists have been able to extensively study the effects of PB on society, its impact, and effectiveness. Quantum Budget (QB) on the other hand is a novel idea, which has yet to be validated in the real-world, and tested for its practical feasibility. This section shall accordingly undertake an attempt to compare QB to PB by

conceptually discussing the differences between QB and PB, as well as compare the impact of each innovation on society.

### 3.1. Comparing the underlying concepts: participatory vs. liquid democracy

Geldmacher-Musiol et al. [4] provide a critical review of the many issues implied by citizen participation in general, with a focus on PB in particular. A major point of critique is that the introduction of PB initially triggers high expectations amongst citizens, which later often fail to materialize, resulting in frustration and disappointment amongst those who participated. This frustration is comprehensible, as many people participating in PB contribute their ideas and spend significant time to develop these ideas, to formulate them, to advocate them to their peers and authorities, just to have them rejected in the end. Frustrated participants, Geldmacher-Musiol et al. argue, give up participating in PB, which is one reason why PB fails to attract the participation of more than just a marginal percentage of citizens – considerably successful PBs attract only up to 2-3% of citizens eligible to vote (ibid.).

Another reason why PB fails to reach beyond only a marginal interest can be found in the varying levels of the general political interest of any population. Thus, Boje & Masser [3] found, up to 15-20% of a population have no interest in politics at all, up to 5-10% are politically active individuals who take part in political life through political parties or NGOs, and ca. 70-80% are politically passive, but can be "activated" to take stance on issues that they consider sufficiently relevant.

Compared to the other wide-spread forms of democratic engagement – representative democracy and direct democracy, participatory democracy is disproportionally wasteful with regards to the resources (time, energy) it demands from citizens. In a democracy, the conceptual sovereign body are the citizens collectively – i.e., all individuals eligible by law. Direct democracy, if exercised in form of occasional referenda on major political issues, demands only a symbolic expression of preference from the citizen as a manifestation of commitment to the democratic process. Same is true for representative democracy, where all that citizens need to do is to cast a vote for one of the available candidates or political parties to take part in the ritual that legitimises the continuation of the institutions of modern democracies. Participatory democracy in comparison, however, is extremely demanding, while offering (too) little reward in exchange for the time invested.

Liquid Democracy (LD) as a forth form of democratic engagement offers a way to overcome the issues of participatory democracy while preserving its potential to enable full democratic participation. Looking at it from a philosophical perspective, Blum & Zuber [2] found that LD is significantly more democratic than the other forms of democratic engagement.

LD achieves the goal to give more power to the conceptual sovereign in a democracy, i.e., the collective of citizens, by taking a direct-democratic approach, whereby each citizen can express their vote directly on any matters they'd consider being relevant to them. LD embeds the principles of representative democracy by allowing citizens to delegate their political power to other individuals (or organisations) whom they trust. On top of that, LD contains the features of participatory democracy: it allows citizens to self-organise into interest groups where they can engage in debates, make plans, and decide on matters of public interest, and finally delegate the execution of their decisions to existing institutions, organisations, or individuals. The three existing forms of democratic decision-making – participatory, direct, and representative, are combined in LD, which thus acts as a universal method for a community to exercise its sovereignty in the scope of their democracy.

The advantages that LD has over the other three forms of democratic engagement accordingly correspond to the advantages QB would have over PB and other forms of public financing. The state of the art in public financing is to take a representative approach – elected representatives in parliament or other institutions of modern democracies draft up and vote through the community's budget. In PB, these tasks are entrusted to citizens, who have to invest time and energy in engaging with all necessary processes, whereby such engagement often results in frustration and disappointment. Behind this backdrop, QB could offer a solution to satisfy the appetites of those citizens, who aim to actively engage in politics (the max. 5-10%), while preserving the interest of the majority who has no desire to be bothered unless something important comes across that would affect them (the 70-80%). Perhaps even the remaining 15-20% abstainers of representative democratic processes could be engaged in LD / QB, as they might wish to permanently delegate their political power to friends or family?

### 3.2. Comparing the impact: incremental vs. radical innovation

Both PB as well as QB are primarily about bringing innovation to democracy. PB aims to innovate by fostering citizen participation on top of an existing political and governmental culture, while QB aims to innovate by introducing a novel culture of politics and societal governance.

Innovation as such can be either incremental, or radical [1]. Incremental innovation is the improvement / alteration of something existing, while radical innovation is the invention of something (radically) novel, which did not previously exist. "Add successively as many mail coaches as you please," wrote Joseph Schumpeter in his *The Theory of Economic Development* [cf. 1], "you will never get a railway thereby". "Breeding home pigeons that could cover a given space with ever-increasing rapidity did not give us the laws of telegraphy, nor did breeding faster horses bring us the steam locomotive" wrote Edward Menge (ibid.) to likewise emphasize the importance of radical innovation.

Radical innovation bears potentials for *transforming* industry, economy, and society. The invention of the combustion engine has reduced animal-based transport to the level of tourism and sport, just as has the successful application of the screw propeller to ships transform naval transport and reduced sailing to a mere leisure activity; the introduction of electricity-based household appliances (kitchen stove, washing machine, dishwasher) has transformed society by making time available for leisure and eliminating the need for household servants; etc. Incremental innovation on the other hand, is crucial for the ripening process of technology, as well as its further development and fortification – it is due to incremental innovation of the underlying technology, that early flying machines have been transformed into the safe commercial aircrafts of today.

In the context of societal governance, PB is a slight add-on to the existing democratic processes. As such, it bases on the existing infrastructure provided by the respective governments – it requires that governments establish processes to support PB, govern the processes, and finally interpret and execute the will of the participants. This mediation by government bears fears and concerns on side of existing government structures, which imply limitations on the extent to which PB can unleash its innovative potentials.

Geldmacher-Musiol et al. [4] outline some of the fears and worries that occupy government officials: one such worry is that citizens can't grasp the complexity of the underlying processes to implement the chosen projects; another fear is that citizens would propose large quantities of silly or utopic ideas that would impede normal work of the public administration and draw away scarce

human resources from more important tasks. From a perspective of the citizens, Geldmacher-Musiol et al. (ibid.) emphasize the discontent with limitations of the available budget per project (e.g. just a couple of 10.000 EUR per project), or the limitations with regards to the area of application – e.g., limited to civil infrastructure such as roads, parks, schools, etc.

The discontent on each of the sides limits the extent to which PB could transform power relations in a democracy. PB initiatives are often regarded as publicity stunts of new governments or aspiring politicians that serve selfish goals such as self-promotion, legitimacy-building, or the creation of powerless new bureaucratic institutions that are really only an end in itself. PB disillusions citizens as it fails to meet their expectations with regards to the impact of citizen participation, and often fails to reward citizens properly for their participation. Accordingly, PB projects require a constant influx of new participants to sustain – pupils or students are a welcome target group, accordingly. This severely limits the ability of PB to develop into a sustainable culture that would transform politics as we know it.

Unlike PB that is being practiced for several decades worldwide, QB is only an idea for now. QB has neither been instantiated in form of an experimental prototype, and is far away from having been validated and tested in the real world. Accordingly, its transformational impact can only be discussed in form of thought experiments and philosophical discussions. Unlike PB, which can be exercised on top of the existing political framework, QB would require the introduction of new technological solutions. This would include "wiring" individual informatized tax contributions into the Virtual Communal Fund (VCF), setting-up mechanisms to access the VCF and to control such access, establishing mechanisms for notification of individuals of proposals on how to spend the funds available in the VCF, engineering of dashboards, forums, and other tools to visualize the underlying processes, etc.

As QB would require the establishment of a strong technical infrastructure on top of which liquid democratic processes required, amongst others, for QB, would run, it would change the power relations between the conceptual sovereign body (the collective of citizens) and the government. The needed infrastructural investments are expected to positively impact the economy, while the transformational impact QB would have on the political culture, is suggested to bear effects that would elevate civilization on to a new level [8].

## 4. Conclusion

This paper compared two ideas to increase citizen involvement in societal governance, namely the Participatory Budgeting (PB) and the Quantum Budget (QB). The ideas were compared from two perspectives – how they can increase the power of citizens on the relation with governments, and which impact they have / could have on transforming society.

From a perspective of democratic innovation, PB acts as a tool to fortify existing power relations between those who govern and those who are governed. Although it promises to foster democratic inclusion of citizens in the processes of public governance, it fails to deliver on such promise, leaving behind each round of PB disillusioned and disappointed citizens who fail to see their expectations met.

PB is an idea that complements existing forms of democratic action: *participative* democracy runs side-by-side along *representative* democracy and *direct* democracy as two well-established forms of interaction between those who rule and those who are ruled. This complementarity with existing

forms of interaction limits its potentials for societal transformation. QB on the other hand relies on a fourth form of democratic action – *liquid* democracy, which combines these three traditional forms of interaction into a new, technology-enabled framework for steering and governing society, where democratic action is a first-class citizen.

As QB is currently nothing more but an idea, significant research and engineering efforts would need to be put in place to develop the framework for a new generation of democracy. All these development and engineering efforts would however enable the development of a new culture, which would be "digital" from the very beginning. This new culture could then translate to new economic impulses, new investments into a digital transformation of society, new jobs, and new hopes for civilization to advance to a new level.

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