TALLINN UNIVERSITY OF TECHNOLOGY
School of Information Technologies

Anders Røsten Mærøe 156411IVGM

UNDERSTANDING E-DEMOCRACY: KEY FEATURES TO INCREASE CITIZEN PARTICIPATION IN E-PARTICIPATORY BUDGETING PROJECTS

Master's Thesis

Supervisor:	Alexander Norta
	Associate Professor
Co-Supervisor:	Ingrid Pappel
	Associate Professor

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Anders Røsten Mærøe 156411IVGM

E-DEMOKRAATIA MÕISTMINE: KODANIKE OSALUSE EDENDAMINE KAASAVA EELARVESTAMISE PROJEKTIDES

Magistritöö

Juhendaja:	Alexander Norta
	Dotsent
Kaasjuhendaja:	Ingrid Pappel
	Dotsent

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Author's declaration of originality

I hereby certify that I am the sole author of this thesis. All the used materials, references to the literature and the work of others have been referred to. This thesis has not been presented for examination anywhere else.

Author: Anders Røsten Mærøe

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Abstract

Over the last decades, there has been an increase of e-Government services in the public sector. Seeking to increase e-Democracy, local governments are including citizens in parts of the budgeting processes using e-Participatory Budgeting (e-PB) projects. Despite the effort of shared decision-making, many of these projects are lacking broad citizen participation. Through generalizing the characteristics of successful e-PB projects, this thesis provides a new theoretical framework of key e-Democracy features. The goal is to better describe and increase the understanding of what kind of features that are needed to generate relevance and participation in the projects. Three case studies of e-PB projects were selected to analyse the citizen participation and the validity of the theoretical framework. The case study showed that if key e-Democracy aspects were present, such as inclusion, governance, administration and legitimacy, the projects would have a broader citizen participation. The analysis showed, as well, that the more funding each project gets, a higher citizen participation was present. Despite these findings, the thesis reflected that it was hard to recognize which feature that had the most dominant role, and a general conclusion was not possible through the current framework. Future analysis might use the framework as an inspirational factor, but not as a framework for more citizen participation in e-PB projects.

Keywords: *e-Democracy, e-Participatory Budgeting, e-Voting*

This thesis is written in English and is 71 pages long, including 6 chapters, 4 figures and 3 tables.

Annotatsioon

E-Demokraatia mõistmine: kodanike osaluse edendamine kaasava eelarvestamise projektides

Avaliku sektori pakutavate e-teenuste hulk on viimaste aastakümnete jooksul oluliselt suurenenud. E-demokraatia tugevdamiseks on kohalikud omavalitsused võtnud suuna kodanike osaluse ergutamiseks kaasava eelarve projektides. Vaatamata jõupingutustele kaasavat otsusetegemist tagada on paljudes sellistes projektides kodanike osalus piiratud. Toetudes edukate kaasava eelarve projektide omaduste üldisustele, pakub käesolev magistritöö välja e-demokraatia tunnusjooni hõlmava teoreetilise raamistiku. Töö eesmärk on edendada projektide õnnestumiseks vajalike funktsioonide kirjeldusi ja nende mõistmist. Kaasava eelarve projektidest valiti välja kolm juhtumit, et analüüsida kodanike osalust ja teoreetilise raamistiku paikapidavust. Juhtumiuuring näitas, et kodanike kaasamine oli suurem sellistes projektides, kus olid esindatud e-demokraatia peamised aspektid nagu kaasamine, valitsemine, administreerimine ja õiguspärasus. Lisaks näitas analüüs, et suurem projektirahastus on seotud ulatuslikuma kodanike osalemisega. Antud tulemuste juures selgus, et esineda võivad ka teatud välised tegurid, mistõttu ei olnud võimalik seatud raamistikku kasutada üldiste järelduste tegemiseks. Edasine uurimistöö saab seda kasutada kui inspireerivat tegurit, aga mitte kui raamistikku, uurimaks kodanike kaasamise suurendamist kaasava eelarve projektides.

Märksõnad: e-demokraatia, kaasava eelarve koostamises osalemine, e-hääletamine

Lõputöö on kirjutatud inglise keeles ning sisaldab teksti 71 leheküljel, 6 peatükki, 4 joonist, 3 tabelit.

List of abbreviations and terms

BIM	Building Information Modelling
CCI	Construction Cost Index
e-ID	Electronic Identification
e-PB	e-Participatory Budgeting
EU	European Union
IoT	Internet of Things
PB	Participatory Budgeting

Table of contents

List of figures

List of tables

1 Introduction

In later years, the use and popularity of e-Participatory Budgeting (e-PB) projects have increased [11]. The goal of this form of e-Democracy is to open for new possibilities of digital citizen inclusion. The motivation behind this thesis is to gain more insight about how efficient e-Participatory Budgeting projects are at generating participation amongst citizens. This curiosity was triggered when the author first read the initial report of the Tartu e-Participatory Budgeting (e-PB) project [41]. To analyze the topic, a theoretical framework will be established to find key e-Democracy features in different e-PB projects. The aim is to increase the understanding of and describe new potential ways to increase the popularity and relevance of future projects.

1.1 Problem Statement and Research Objective

"...the reality of online deliberation, whether judged in terms of its quantity, its quality, or its impact on political behavior and policy outcomes, is far removed from the ideals set out in the early to mid-1990s." [14, p 12].

Over the last decade, there has been an increase in digital services internally and externally in governments around the world [32]. Even though there has been an increase of digital government services, the ideals of better e-Democracy are far from reached [14, p 12]. Denying citizens better means of digital voting, inclusion and e-Democracy, can be argued to stem from fear of populism, but as well as a "middleman paradox", where politicians and other stakeholders fear for their own positions and power [49].

One specific form of e-Democracy is e-Participatory Budgeting (e-PB) projects, which aims at including citizens in the budgetary process and thereby introduce a *"more democratic practice of governance"* [11, p 939]. However, to find absent key e-Democracy features of an e-Participatory Budgeting projects, is a complex, but important topic, which this paper seeks to broaden the understanding of. In order to

achieve this, a generalized theoretical framework of e-Democracy features will be put in place to better answer this question. Do projects in lack of e-Democracy features tend to fail more often? Which key features of e-Democracy need to be present for an e-Participatory Budgeting project to be relevant and popular amongst the citizens?

The paper will not focus on digitized government services, but rather take on a democracy perspective through examining the key e-Democracy features. The research objective is to arrive at a theoretical framework that displays the potential features needed to gain citizen participation. A case study with three cases will be used to confirm validity of the framework. All cases are e-Participatory Budgeting projects, but from three different countries. Political conditions and the total size of each budget varies between the different cases. The aim is to prove that if the projects are adding *"more democratic practice of governance"* [11, p 939], citizen participation will be higher. The objective is to understand potential correlating patterns between the different cases. When its flaws are pointed out in a more concrete way, suggestions of improvement for future projects will be possible. To conclude if the framework is useful or not, an evaluation of the projects based on only one single variable, the size of the budgets, will be conducted. Hence, the analysis will be done based on key e-Democracy features and the size of the budgets. If both the units of analysis are present, the conclusion might be more ambiguous than if only one factor is present.

Introduction	*Literature review*	*Methodology*		*Case study*	*Discussion*	*Conclusion*
Explanation of challenges and problems with e-Democracy and e-PB projects of today.	Description of theoretical features to improve the current status of e-PB projects.	Selection of research strategy and e-PB projects to analyze. Aim to find patterns and similarities of the theoretical framework.	Norway (Fredrikstad e-PB project) / Germany (Lichtenberg e-PB project) / Estonia (Tartu e-PB project)	Analysis of similarities and correlations between theoretical framework and cases.	Discussion and analysis of the validity of the findings.	Conclusion on the usability of the framework in regard to real e-PB projects.

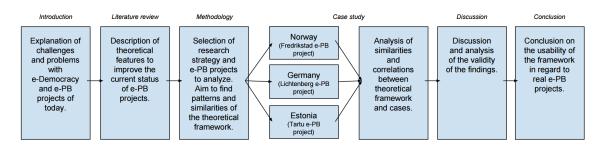*Table 1: Visualization of research process*

1.2 Context

Since the advent of the Internet in the 1990s, the aims of many governments have been to transform old public administrations into new, more cost efficient, digital services [13, p 444]. Grönlund and Horan defines these aims as: *"1. More efficient government, 2. Better services to citizens, and 3. Improved democratic processes"* [29, p 718]. The

first and second aim are administrative or e-Government goals, where the objective is to create *"changes to the internal organization of the bureaucracy through the emerge of ICTs"* [45, p 219]. The third aim can be used to describe the e-Democracy aspect of the transformation. e-Democracy is the *"relationship between political actors and citizens in political processes"* [45, p 219]. In large scale e-Government reforms, such as the Estonian X-road [24] and e-Tax system [23], there has been an increase in interoperability for the government. In contrast to the success stories of e-Government reforms, the reality of online deliberation and e-Democracy is *"far removed from the ideals set out in the early mid-1990s"* [14, p 12].

One of the most prominent examples of Participatory Budgeting (PB) was made in Porto Alegre, Brazil, in 1989 [11, p 939]. The aim of that project was to better include citizens in the budgetary process and organize a more democratic form of governance. Since then, the use of Participatory Budgeting projects has increased and been spread to many other countries [11, p 939]. In many of these cases, digital technology has transformed the PB projects into e-Participatory Budgeting (e-PB). By adding digital means, with e-Participatory Budgeting, it was though that citizen participation would increase. Surprisingly, cases like Belo Horizonte in Brazil, have shown that the public participation *"significantly decreased over time"* [59, p 85] despite the increased technological access. Between 2001 and 2013 there was recorded at least 170 e-Participatory Budgeting projects at 101 locations globally [11].

1.3 Evaluation of reference sources

As a source for this paper, articles by Ann Macintosh is commonly used. Today, Macintosh is an Emeritus Professor of Digital Governance at the University of Leeds [68]. She has been an advisor for several governments, in matters of e-Democracy and e-Government [68]. Based on her biography, she can be classified as more of a practitioner than a purely academic researcher. Because the field of e-Government and e-Democracy is relatively new, this can be seen as something positive. Even though, in terms of a critical evaluation of the reference sources of this thesis, the work of several other authors has been included, when generating the theoretical framework. This has been done to generate a broader and deeper understanding of the subject.

When evaluating critical thinking of own research and findings, objectivity is an important feature. This is a problem in all forms of research, often because of the ambitions of the author. In this thesis, total objectivity, has been impossible to reach. Individual and physiological aspects of the citizen's ambitions and reasons to participate, have not been thoroughly researched. The focus has been on analysing the subject from an information system or aggregated project point of view. These aspects might affect the outcomes, which defines the need for more research in this field.

2 E-Participatory Budgeting and key e-Democracy features

To describe what e-Democracy features an e-Participatory Budgeting (e-PB) projects needs to become relevant and popular, one must first understand its background features. e-PB projects can be categorized as a form of e-Democracy, that enables e-Participation for its citizens [11]. It is, therefore, important to display what e-Democracy is, how e-Participation is increased and different models of citizens' engagement. This background description will enable the creation of a theoretical framework of e-Democracy features. Additionally, the potential and limitations of an e-Democracy project will be described.

2.1 E-Participatory Budgeting as an e-Democracy project

The aim of Participatory Budgeting (PB), in its original form, is to include citizens in the budgetary process and to strengthen the democratic decision-making processes [11, p 939]. This is done through inviting the citizens to influence the public budget by relocating public resources [59]. If one move away from the paper based processes and make the system accessible through digital means, it may be defined as an e-Participatory Budgeting (e-PB). Both PB and e-PB projects are connected to the local and municipal level [59], where budget processes are more tangible.

e-PB projects are often offered in a context of digital government services. As described by Grönlund & Horan [29], such services can be divided into three categories, where e-Democracy is the third of the goals for e-Government. e-PB projects are, in this sense, not a digital government service, but rather an e-Democracy service. By Macintosh [48, p 2] e-Democracy is described as *"the use of information and communication technologies to engage citizens, support the democratic decision-making process and strengthen the representative democracy"*. The aims of e-PB projects can be connected to this definition. By Macintosh [48, p 1], e-Democracy is described as holding two separate features: e-Voting and e-Participation.

2.2 E-Participation

e-PB projects are dependent upon the concept of e-Participation, according to Macintosh [48]. Sanford and Rose [63] gives a similar, but maybe more specific definition: *"The focal point of eParticipation is the citizen, i.e., the purpose of eParticipation is to increase citizens' abilities to participate in digital governance, including participation in the political process and the transformation of digital government information and services."* [63, p 408]. The citizen is the main actor of decisions, by Sanford & Rose's definition, and responsible for the transformation of digital government information and services. They define that the technology-mediated interactions between the formal politics sphere and the administrative sphere is not included in the definition of e-Participation [63, p 408]. This means that by having proper e-Participation the citizen should be included in *"the planning and/or development of some form of government reform"* [63, p 408]. Krenjova & Reinsalu argues that *"it is often assumed that people lack knowledge necessary to participate in public affairs"* [41, p 28]. They compare this with the assumption that people should not be asked how to build a bridge, but rather asked where to put it. Or *"one might go even further and ask people whether they want a bridge at all"* [41, p 28]. The point of this comparison is to show that e-Participation is about understanding the needs of the citizens, rather than managing the technicalities of how the society should run. e-Participation may, therefore, be seen as an enabler of citizen participation in the political processes and the transformation of government. e-Participation is by this definition the key enabler of e-PB projects and e-Democracy.

2.3 E-Democracy values and features

To understand how e-Participatory Budgeting projects can enable *"more democratic practices of governance"* [11, p 939], we need to know what values and features an e-Democracy project should generate. By analysing articles of several authors, in the field of democratic requirements, e-Participation and e-Democracy, the aim will be to generalize, from their conclusions, key features of e-Democracy projects. This will enable the creation of a new theoretical framework to analyse current and future, e-PB projects.

Robert Dahl [18] defines five democratic requirements. To have a proper democracy these requirements must be present: (1.) Effective participation, defining that all members should have *"equal and effective opportunities for making their views known"* [18] before a policy is decided and implemented. (2.) Equality in voting, means that all citizens should have *"an equal and effective opportunity to vote"* [18] before policy decisions are made. (3.) Gaining enlightened understanding, describes that all citizens should have enough time to learn about the alternatives, and consequences, of a policy before voting. (4.) Exercising final control over the agenda, describes that a citizen should be able to influence *"what matters are to be placed on the agenda"* [18]. (5.) Inclusion of all adults, suggests that *"all adult permanent residents should have the full rights of citizens"* [18].

In the OECD [56, p 33] report, Macintosh lists three outputs for more engagement through e-Democracy project. These are (1.) producing better quality policy, (2.) building trust and gain acceptance for a policy, and (3.) share responsibility for policy making. Additionally, seven sub-aims are listed as: (a.) Reach and engage a wider audience. Greater accessibility of information, will be possible through providing digital availability, manageability, affordability, reliability, clarity and openness for those with special needs [56, p 44]. (b.) Provide relevant information. This can be achieved through more understandable information for the individuals or specific groups. (c.) Enable more in-depth consultation. The third sub-aim can be achieved by having better tools to enable more online debate with or amongst citizens. (d.) Facilitate better analysis of the e-Participation contributions. The wanted output is to improve policies and to support better decision-making processes. (e.) Provide more relevant and appropriate feedback to the citizens. The potential output is more *"openness and transparency in the policy-making process"* [56, p 33], which might lead to improved legitimacy of policies. (f.) Create better monitoring and evaluation processes for projects. The output is to *"ensure continuous improvements"* [56, p 33] and thereby better governance.

Another article by Macintosh [48], generalizes ten key dimensions of e-Participation outputs. The first dimension describes that e-Participation should guarantee a certain level of participation. In regard of deciding public policies, these specifies at *"what level of detail, or how far to engage citizens"* [48]. She defines three levels of e-

enabling, e-engaging and e-empowering. These levels will be analyzed more thoroughly later in this chapter. The second dimension is characterized as the access to different stages of the decision-making process. This specifies when to involve citizens, granting them more control of the political agenda. The third dimension defines access of different actors or stakeholders to the decision-making process. This tells us *"who should be engaged and by whom"* [48]. The fourth dimension describes how technology can be used in e-Participation projects. This defines *"how and with what to engage citizens"* [48]. The fifth dimension states the rules of engagement. How much personal information should a citizen need to give away to take part in the e-Participation project. The sixth dimension describes the duration and sustainability, meaning for what period of time the system will function and how it will continue to include the citizens in the future. The seventh dimension is about the accessibility, analyzing *"how many citizens participated and from where"* [48]. The eighth dimension states the use of resources and promotion, meaning the cost effectiveness of the system. The ninth dimension describes the measurements of evaluation and outcomes of the e-Participation. The last dimension provides crucial factors for success, meaning political, legal, cultural, economic and technological factors. These key dimensions will enable a framework to characterize important e-Democracy features of e-PB projects.

In a more resent article by Macintosh & Whyte [47], the ten key dimensions from Macintosh [48] are further developed to define the objectives of local e-Democracy project in the UK. The desired features can be summarized as: (a.) better representation, (b.) more engagement, (c.) increased transparency, (d.) decrease conflict and increase consensus, (e.) more political equality, (f.) more responsive community control, (g.) better informed opinions, (h.) more in-depth consultation, (i.) more cost-effective analysis of contributions, (j.) provide better feedback to citizens, (k.) more trust and better social security, (l.) be more relevant and legitimate and (m.) better usability, navigation and flexibility.

An article by Phang and Kankanhalli [58] describes potential features of e-Democracy in four categories. The first category is related to information exchange and describes how an e-Democracy should produce an *"avenue for citizens to participate freely"* and give *"opportunity for two-way open exchange of information"* [58, p 129]. The wanted

feature is better governance through better and more in-depth consultations with the citizens. The second category is education and support-building. Citizens are getting a better understanding of policy-making through increased e-Democracy, which enables the output of greater legitimacy of policies. The third category is decision-making supplement, which defines the governance perspective of the wanted features. e-Democracy generates better policies by having *"mechanisms to obtain specific information useful to the decision making"* [58, p 130]. The last category is called input probing, which describes the ability e-Democracy creates to efficiently collect and analyze citizens' opinions.

Bonsón et al. [7] have created four dimensions, based on theoretical improvements of Web 2.0 technology. These improvements can be described as desired features of e-Democracy. The first dimension is the improvement of transparency, which is created by bringing the *"public sector agenda and activities closer to the citizens"* [7, p 125]. The second dimension is the improvement of policy making, describing new forms of participation as outputs of better policies [7, p 126]. The third dimension is the improvement of public services through *"innovative mechanisms for service delivery"* [7, p 126] and more ability to understand the needs of the citizen. The last dimension describes the improvement of knowledge management, making it easier to process and store information in cross-agency cooperation throughout the democratic system.

The last source of potential key features of e-Democracy projects is a report from the European Parliament [26]. The key findings of this report are based on national e-Democracy projects, and their potential features. The first key finding is the potential to enhance citizens' participation in policy-making. The second is that e-Democracy can and should ensure the learning processes for the citizens, by enabling exchange of views. The third finding is the ability of collecting innovative ideas, which gives the feature of better governance. The last finding is the feature of increasing political legitimacy and trust. This is done through letting citizens monitor and participate in the decision-making process more actively.

2.4 Theoretical framework of e-Democracy features

The articles of the previous sub-chapter, describe essential e-Democracy features. The lack of structure and generalization of these features, have inspired the creation of a new theoretical framework, explained in this part of the paper. To make this generalization and structure, the article *"Participatory Budgeting in Porto Alegre: Toward a Redistributive Democracy"* by Santos [64], will be used as inspiration. Santos divides the political constellation of participatory budgeting into four categories: (1.) Citizen and popular organizations, (2.) Executive as a political body, (3.) Executive as a technical, administrative body, and (4.) Legislative body. The first category is about the citizen inclusion. The second describes the governance aspect of Participatory Budgeting. The third focus on the administration and technical aspects, while the fourth category describes the legitimacy of the policies, through the rule of law. When trying to divide the different e-Democracy features into categories, a similar approach can be used. The main difference from the framework of Santos [64] is the last category, which in our case only will represent the legitimacy feature, rather than the legislative body. In the four new categories, "Inclusion", "Governance", "Administration" and "Legitimacy", the key e-Democracy features of the articles are reshuffled to match the new framework and enable a comparison of different e-PB projects.

2.4.1 Inclusion

The first category is based on several of the e-Democracy features described earlier. Key features such as: shared responsibility for policy-making, effective participation, equality in voting, control of the agenda, inclusion of all adults, reach and engage a wider audience, providing relevant information, levels of e-Participation, access for different stakeholders and actors, time to give enlightened answers or complaints, representation and political equality, can be generalized as examples of citizen inclusion. The first of the key e-Democracy features, defining factors of success for an e-PB project, therefore, is categorized as "Inclusion". To recognize the e-Democracy feature of citizen inclusion, two questions will be essential: (1.) "When to include the citizens?" and (2.) "To what degree should the citizens be involved?".

When to include citizens?
To recognize the e-Democracy features such as: control of the agenda, enough time to give enlightened answers or complaints, political equality and enhance citizens'

participation in policy-making, a standardized policy-making process description is needed. By Fisher and Miller [28], the process of policy-making have been categorized into five steps: (1.) agenda-setting, (2.) policy formulation, (3.) decision-making, (4.) implementation, and (5.) evaluation. The first step, agenda-setting, represents the recognition of a problem and to put it *"on the agenda for serious consideration of public action"* [28, p 45]. The second step, policy formulation, is about defining the objectives for the policy. The third step, decision-making, is defined as when an action is made, a *"bargaining between diverse actors within a policy subsystem"* [28, p 49] or that a public vote has taken place. The fourth step, implementation, is defined as the phase of execution or enforcement of a policy, and can involve development of legislation, regulation, guidance and a delivery plan. Another definition of policy implementation can be *"what develops between the establishment of an apparent intention on the part of government to do something, or to stop doing something, and the ultimate impact in the world of action."* [57, p 266]. The implementation phase is often conducted by another party than the ones who decided, e.g. a responsible institution or organization [28, p 51]. The last step is called "evaluation", and involves measuring the success and potential flaws of a policy. Seen from an e-PB project perspective, the steps of the policy-making cycle can be used to measure citizen involvement. The number of steps the citizen are asked for his or her opinion, determine the level of influence the citizen is given.

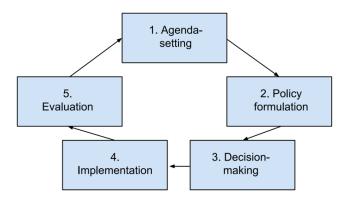*Figure 1: The policy-making cycle*

To what degree should citizens be involved?

There are different ways citizen inclusion can be viewed. Different levels and characteristics have been defined by different authors. A merger of three different

frameworks will be made, to understand the different levels and perspectives of citizen inclusion. Päivärinta & Sæbø [60] have generated a framework, which can be used to describe different forms of e-Democracy projects, based on citizen inclusion. By differentiating who sets the agenda, citizens (bottom-up) or government / politicians / officers (top-down), and the implicit or explicit role of citizens in decision-making processes, emerges four different types of projects. Table 2 represents these different forms of e-Democracy projects as (1.) Liberal (2.) Deliberative, (3.) Partisan and (4.) Direct e-Democracy projects.

Citizens set the agenda (bottom-up projects)	**Partisan e-Democracy projects**	**Direct e-Democracy projects**
Government, politicians and officers, sets the agenda (top-down projects)	**Liberal e-Democracy projects**	**Deliberative e-Democracy projects**
	Citizens mainly implicitly included in decision making processes	Citizens have an explicitly defined role in decision making processes

Table 2: The models of e-Democracy from Päivärinta and Sæbø.

A liberal e-Democracy project is defined by its top-down approach, where citizens may participate through government initiated projects. The model displays a representative form of democracy, but with greater opportunities of communication between citizens and government representatives [60, p 825]. An example would be an e-Democracy service which gave the citizens the ability to make suggestions to the politicians, merely as a "digital suggestion box". This type of e-Democracy characteristics is commonly used for e-PB project. Citizens will be able to state their needs, while the representative political system is the final authority.

Deliberative e-Democracy projects are based on the representative democracy structure, but has an explicitly defined role for the citizens in the policy-making process. The process is based on a top-down relationship between the politicians and the citizens, but requires communication between the two parties before making the final decisions [60, p 825]. Citizens are more explicitly and directly connected to the decision-making process, making the local politicians more obliged to ask relevant questions. Dahlberg

[19, p 167] describes that a deliberative e-Democracy project should *"put forward and challenge claims and arguments about common problems until the best reason has been given and fully defended"* [19, p 167]. For an e-PB project with such characteristics, the politicians will be required to inform and get feedback from citizens digitally, before deciding. This form of e-Democracy project aims at educating their citizens and produce relevant policy. The political decisions must be based on the actual needs of the citizens.

Partisan e-Democracy projects are characterized by *"citizen-initiated participation and implicit citizen intervention in the decision-making process"* [60, p 824]. Citizens does not have a formal role in the decision-making process, but can involve themselves through external bottom-up initiatives. Through online forums, chat room discussions or blogging [60, p 824], this is made possible. In regard of e-PB projects, this form of e-Democracy can easily be created ad hoc, through i.e. Facebook groups and other initiatives. This can be to influence the process of deciding the local municipal budget.

Direct e-Democracy projects are a form of e-PB projects where citizens or networks of citizens replace the role of traditional institutions [60, p 826]. The idea originates from the early democracies of Athens and Rome, where all free men could vote directly in political decisions [42, p 1]. In this model, the Internet does not only supplement communication for democratic debates, but becomes a crucial part and precondition for the democracy [60, p 826]. The aims for a direct democracy would be to increase political participation, social justice or economic democracy, through the transfer of power from institutions to the voters [2, p 176].

Comparable to Päivärinta & Sæbø [60], Åström [76] has created a three-level model for citizen involvement, through e-Democracy. These are quick, strong or thin e-Democracy [76]. The quick e-Democracy model can be compared to direct and partisan e-Democracy models. All citizens are equal to the political elite, with the same wisdom and ability to rule [76, p 50]. The technology has enabled the possibility of letting the citizens decide, without the former cost of paper participation. The strong e-Democracy model gives the citizen an important role in regard of more discussion and public debate. This form of projects can be connected to the deliberative e-Democracy model. The aim for the strong e-Democracy is rather to slow down decisions, by generating

more discussion and involving additional stakeholders to the decision-making process [76, p 50]. The thin e-Democracy model is different from the two other models. This model describes the citizen as a consumer, which is unqualified to decide. The model presumes that citizens know the political program of their representatives, and have the ability to change the politicians representing them [76, p 51]. The use of technology in this case is to inform the citizens and create transparency, so that the citizens choose the representatives based on facts [76, p 51].

To create a framework to measure citizen inclusion in the e-PB projects, the three levels from Macintosh [48] will be used in combination with Päivärinta & Sæbø [60] and Åström [76]. The first level is called e-enabling, where the aim is to increase accessibility and understanding of information through digital means. Technology is used to reach a wider audience, which would not gain the information through standard information means [48]. The second level, e-engaging, describes how technology can be used when *"consulting a wider audience to enable deeper contributions and support deliberative debate on policy issues"* [48, p 3]. The third level, e-empowering, is defined by *"supporting active participation and facilitating bottom-up ideas to influence the political agenda"* [48, p 3]. At this final level, citizens are viewed as producers of policies, not consumers. When combining the models of the three different articles, a more holistic view of voter inclusion will be present. The Macintosh [48] model is constructed within a representative democracy model. The first and lowest level of the new model, visualized in figure 2, will be e-enabling. The role of the citizen is described as a policy consumer, with little or no form of inclusion. This level matches with the characteristics of the thin e-Democracy model. For an e-PB project, this level is irrelevant, because citizens cannot participate. There is only a top-down perspective, where technology is used to inform citizens. The second level, e-engaging, matches with the model of liberal and deliberative e-Democracy projects. The aims are to get citizens opinions, and that technology creates a suitable platform for citizens to discuss and evaluate different policies. This can as well be connected to the strong e-Democracy model. The aim for the category is to get a wide set of policy inputs, and rather have slower processes where better policies is the goal. The relationship is still defined as top-down, but the category defines a more explicit role for the citizen. Because many e-PB projects work in a local representative democracy model, is this a common category for e-PB projects [11]. The citizens participate to the budget process by being asked for

their opinions, where the politicians make the final decision. Because the e-empowering level should be split into two levels, where the third category describe a representative e-empowerment, while the fourth category describes a direct democracy perspective. The aim of the third category is to influence the policy agenda, shaping the policy dialogue and generating better decisions through discussion. This makes the category comparable with the strong e-Democracy level. The citizens have an explicit role in the decision-making process, and the level is, therefore, connected to the deliberative e-Democracy project category. Secondly, the level will have similarities to the partisan e-Democracy model, where one influences the representative democratic structures by grassroot movements. This is a more direct form of democratic decision-making, and will work outside the government controlled decision-making process. The fourth category represents a direct democracy form of e-empowering, where the decision-making process is explicitly controlled by the citizens. This is the form of e-Democracy projects with the most bottom-up characteristics, and citizens are viewed as policy producers. The direct e-Democracy project model and the quick e-democracy model can be connected to this category, because individuals or networks of citizens can propose, discuss and decide the policies. The category enables a quick form of decision making processes and it is presumed that citizens have the same ability, and / or knowledge, as the elite to make decisions. The partisan e-Democracy model is as well connected to the fourth category, because it has many of the same characteristics as the direct form of e-empowering. Figure 2 represents this new model of citizen inclusion.
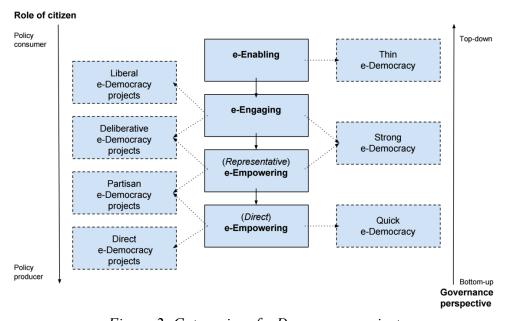

Figure 2: Categories of e-Democracy projects

24

Levels of inclusion

Based on when and how citizens are included, we can describe three levels ranging from low, medium and high. If the e-PB project includes a citizen in 3-5 of the steps in the policy-making cycle and reaches one of the two e-Empowering levels, the project will be classified at a high level of inclusion. When an e-PB project includes the citizen in 2-3 steps in the policy-making cycle, and is at the e-Engaging level, the project will be classified at a medium level of inclusion. If the e-PB project only includes the citizen in one of the policy-making cycle steps and are at either e-Enabling, or e-Engaging level with liberal e-Democracy projects specifications, the level will be classified as low. This division is based on the features of citizen inclusion, explained by the previous e-Democracy articles of this paper.

2.4.2 Governance

To enable better governance through e-PB projects, several e-Democracy features can be present. Based on these features, explained in the previous chapter, production of better quality policy for the citizens or interest groups, are enabled. One need to have proper processes of analyzing all the contributions from the citizens and provide services to monitor and evaluate the processes. The framework of evaluation should be based on different perspectives, such as political, technical and social features. By exercising better community control, obtaining better informed opinions through enabling a better information exchange, more in-depth consultations and collection of innovative ideas, the policies will be more accurate and relevant. This must be done to improve policy making and public services, by using e-Democracy projects as decision-making supplements. To make this more tangible, the ISO 9001 standard of quality management policy systems [38] and ISO 18091 for quality management systems in local government [37], can be used as inspiration to create framework for better governance.

Process design for better governance

The better governance aspect of the theoretical framework, is not concerned with the sophistication of the technology used, but rather focus on the information exchange, input probing and processes which leads to better quality policy. Dwivedi et al. [21] states that one *"depend on whether broader institutions of governance are well-prepared, ready and willing to act on the informational outcomes of the projects"*. The

ISO 9001 and 18091 creates a model that shows how quality management systems should be structured, based on requests from customers, the implementation and the evaluation by the customers [37]. In our context, citizens are the customers. The integration of citizens into the process of the policy creation, to secure that policy output is relevant to the citizens, is guaranteed by the ISO 9001 cycle. The process starts by the information exchange, and in our case the e-PB projects ability to exchange the citizens needs and requirements, into the implementation phase. These first stages are based on identifying who the citizens are and *"the main inputs to the process"* [37]. In the implementation phase, there are four sub-processes defined as 1. Plan, 2. Do, 3. Check and 4. Act [38]. In the ISO 18091, these steps are defined as 1. Measurement, analysis and improvements, 2. Management responsibility, 3. Resource management and 4. Product realization [37]. Seen from an e-PB project point of view, the first stage is about evaluating the feasibility of a citizen suggestion, by analyzing and suggest improvements. The second step is related to the management capacity to implement what was planned [38]. The third step is to monitor that there are enough resources available to realize the project based on the citizen's requests, and the fourth step is the actual project realization [37]. The entire process is about satisfying the citizens requirements and make *"continual improvement of the quality management system"* [37]. Figure 3 describes this process more graphically. To implement the requirements of the citizens, the e-PB project depends on budgets and the real potential to fulfill the relevant needs. This means that to generate better governance, the project does need enough money to satisfy the citizen needs.
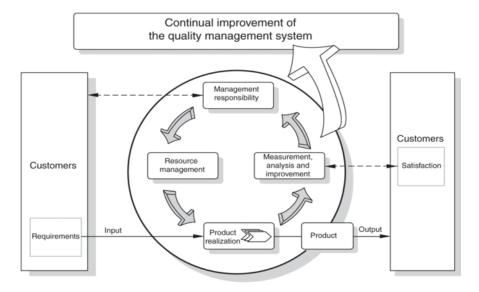

Figure 3: Quality management system, based on ISO 9001

26

Levels of better governance

Based on the project's overall processes of getting feedback from the citizens, facilitating analysis of contributions and produce projects based on the citizen's requirements, the e-PB project will score on a range from high to low. An e-PB project with all the listed qualities of a quality management system and processes which leads to institutions that are well-prepared, ready and willing to act [21], will get a high score. The score is set by the ability to exchange information about the citizen's needs, collect innovative ideas and the actual ability to implement the projects. A medium score will be given to the e-PB projects which only implement citizen suggestions partly and have an ad-hoc processes of implementing the projects. The lowest score will be given to projects which are lacking the proper input probing, information exchange and processes of implementing the suggested project.

2.4.3 Administration

Efficient administration features relate to the new technological means used to engage citizens, regulations on how personal information should be used, increased cost effectiveness, usefulness and usability of the system and the improvement of knowledge management. Because of the limitation of this paper the efficient administration features will be seen from a technological, rather than from a legal or design perspective.

Technological tools for e-Democracy

In the OECD [56] report on e-Democracy, Macintosh created a framework of tools, based on different forms of e-Democracy project and the policy-making cycle. Many of the tools listed can be classified as Web 2.0 tools. These tools can generally be described as means of giving the web users the ability to create, share and interconnect with each other [22, p 392]. Examples of such tools can be blogs, discussion forums, online citizen juries and surveys [56, p 14]. The Web 2.0 tools supports e-Democracy, for example through social media, in a way that allows users to comment, rate, create and share information, generating collaboration and participation [74]. Because the framework of the OECD [56] report is over a decade old, new technological tools for e-Democracy will be relevant to reach a high level of technological e-Democracy features. While Web 2.0 tools are limited to giving the citizen the ability of creating, sharing and interconnecting on the web. The new decentralized technology tools will be able to provide features to organize opinions and influence the local government, either

in a representative or a direct democracy way. What these new means have in common is their ability to let the users connect, read, contribute and vote regardless of location. This can be the gathering and processing of large quantum of data through Internet of Things (IoT), Open Data and Big Data. The decentralization of digital identification and voting are other new technological tools. An even newer and more unused set of tools are the blockchain technology, smart contracts and decentralized autonomous organizations (DAOs). The blockchain tools will not be integrated in the main part of the thesis, but are described in Appendix 1.

Large quantum of data

Technologies such as Internet of Things (IoT), Open Data and Big Data are means to inform and enlighten citizens directly. When the information gets decentralized and the citizens are allowed to process it directly, it can influence the policies on the agenda. The Internet of Things can be described as *"connecting any device with an on and off switch to the Internet (and/or to each other)"* [50]. IoT can help us to get a better understanding of empirical data about the society, when it constantly can monitor data such as air pollution, sound levels, traffic jams, etc. Berman & Cerf [6, p 6] state that *"IoT has the potential to create an integrated ecosystem that can respond to a spectrum of needs, increasing efficiency and opportunity, and empowering people through technology, and technology through intelligence"*. When you give citizens more intelligence and the ability to monitor their surroundings, their inclusion in political matters, through e-PB projects, might increase. This leads us to the technology tools and opportunities open data and big data presents. IoT represents the physical monitoring and collection of data, while big data is about the structuring and ability to understand large quantities of data [1]. Open data is described as all activities where data is published in an open way on the Internet, allowing people to search, evaluate, provide feedback and reuse the data [75, p 224]. Many governments have ambitions to generate more open data for its citizens to use, such as the French Open Platform for Open Data [15]. The combination of IoT, big data and open data can be used for more citizen inclusion, generate better and more accurate policies, lower administrative costs and provide more transparency and legitimacy. These new technological tools enable citizens to collect, real-time process and understand information about their society. The statistics can be used to set new topics on the agenda and better evaluate the outcome of

policies. In the e-PB context, this will mean that the citizens are better able to set relevant policies on the agenda, and vote accordingly.

Decentralization of digital identification and voting

Paper based votes need the physical presence of the citizen, by showing a form of identification. In regular Participatory Budgeting (PB) projects, like the one in Porto Alegre, this physical verification is needed [11]. The framework Macintosh describes in the OECD [56] report mentions SMS and remote electronic voting, but does not conclude on how identification or voting processes should be done. An electronic identification (e-ID) system *"refers to a system of technologies and policies that enable individuals to electronically prove their identity or an attribute about their identity to an information system"* [12, p 2]. This can be expressed through a digital signature that *"is expressed mathematically, ensuring the accuracy of the signature and protection against forging with the help of complex methods and calculations"* [35] to cope with the accountability and efficiency requirements of today. An e-ID needs to automatically recognize and identify citizens based on digital means. A proper digital signature can be used in three different ways. First, as an identification, which aims at describing who you are communicating with. Secondly, it works as an authenticator, which means to verify *"the credentials offered by an individual"* [12, p 4]. This can be done through providing a password or a two-factor authentication *"through proof of possession of a physical or software token in combination with some memorized secret knowledge"* [8]. Thirdly, it can be used as a way of identifying a specific transaction, meaning to be held accountable [12, p 4]. An example of such a tool is the Estonian e-ID, introduced in 2002 through a smart card and later through mobile SIM-card ID [66]. This way, one can ensure that it is the actual person behind the computer and not bots from a domestic or foreign power, trying to give the impression on speaking on behalf of the citizen.

This leads us to e-Voting, which provides the citizens with an opportunity to state their opinions in a digital way. The technology behind e-Voting allow citizens to vote remotely and decentralized online, through signing a digital ballot with their e-ID. When the e-ID can identify, authenticate and hold you accountable for your actions, e-Voting can be enabled. Different from holding an e-petition, where the digital signatures are public, e-Voting needs to provide the possibility of anonymity, based on democratic

election principles. The Estonian e-Voting system uses for this purpose a *"two-envelope concept"* [66, p 8]. It can be described in a similar way as postal voting. The voter first login with their e-ID and then fill out the digital ballot. The ballot is put inside a virtual anonymous envelope which gets encrypted and contains no identification markings. The anonymous envelope is put inside a new virtual envelope which contains the information about the voter, gets digitally signed and submitted. On the election day *"the encrypted votes and the digital signatures...[is]...separated"* [66, p 7] and the system automatically counts the anonymous votes. e-Voting enables e-PB projects where citizens can decide on different suggested policies.

Levels of efficient administration

By properly using new technological means to engage the citizen, administrative efficiency might increase, since the need for human labor will be less. This means more cost efficiency in analysis of contributions as well. e-PB projects with e-ID technology and an online platform where citizens can vote digitally, will therefore get a high score. This includes the system's ability to use IoT, big data and open data, to better inform its citizens. Regulations for how to use personal information will not be included in this scoring system, but is an important feature. A project using mainly Web 2.0 tools will get a medium score, since the identification of citizens is not present. Projects only using the technological tools for a one-way digital monologue, such as just having a webpage with information, will receive a low score.

2.4.4 Legitimacy

To have increased legitimacy features, an e-PB project must generate trust and gain acceptance of policies. The system must provide relevant and appropriate feedback, more enlightened understanding, engagement, transparency and consensus. This means that the processes of the project need to be open, understandable and transparent to the citizens.

Stakeholders, demand and culture

An e-PB project can have the potential capacity to change organizational, structure and power relations [21]. To keep control of the changing conditions, stakeholders might create projects with limited transparency and abilities to provide feedback. Such an e-PB project might not lead to an increased legitimacy features, and might become

irrelevant to the citizens. A project which does not provide openness for all citizens, might not give the citizens actual opportunities [45, p 219] to influence the policies. The demand for such e-PB projects might decrease over time, because the project is not relevant to the general population. The cultural aspects of an e-Democracy project, such as e-PB projects, will require a developed and open political culture amongst citizens and politicians, with similar trust in the democratic processes and institutions [17]. Described from a pragmatic view, the technological means for e-Democracy will be integrated and transformed by the stakeholders and existing systems. This means that in a society without trustworthy democratic institutions, legitimacy features of the system will still be low.

Levels of increased legitimacy

Based on the legitimacy features of an e-PB project, there will be made a score from high to low. A project with a high degree of transparency of the e-PB process, generating more enlightened understanding and the possibility to provide feedback, will receive a high score. If the process of the project only is open and transparent at some stages, is moderate in generating enlightened understanding and have small real possibilities to provide feedback, the project will receive a medium score. A project without openness about the process, no aim to generate enlightenment and no possibilities to provide feedback, will receive a low score.

The key e-Democracy features are visualized through figure 4. This is to get a more graphic understanding of the key features an e-Democracy projects should generate.
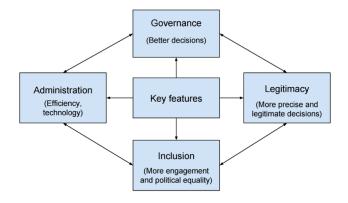

Figure 4: Theoretical framework of key e-Democracy features

2.5 Potential and limitations of e-Democracy projects

To analyze an e-PB project's potential and limitations, we need to understand certain different perspectives. In Benjamin Barber's article *Three Scenarios for the Future of Technology and Strong Democracy* from 1998, three scenarios were listed by how the technology could influence democracy [65, p 30]. Barber states that *"where technology takes our political and social institutions will depend, in part, on where we take technology"* [3, p 575]. From Barber's three articles, we can deduce three views on e-Democracy: an optimistic, pessimistic and pragmatic view. The optimists state the positive potential of using e-Democracy means. The pessimists discuss the potential negative side effects. The pragmatics describe implementation of new technology based on the context it is inserted to.

Optimists like Grossman, Fuller and Fromm saw *"the electronic republic with a new, more direct and pervasive form of democracy"* [42, p 2]. From a positivist view, technology will enable more equal access to information and aid people to actively take part in decision-making processes [65, p 31]. Fromm argued that the use of technology could cure the lack of inclusiveness from current political processes [43, p 9]. The digital means will help to increase the interaction between the citizens and, thereby, increase their social capital [30, p 74]. From a positivist view, one can see several potential features of e-PB projects. For example, increased interaction between citizens, easier communication based on location and time and *"engage with a wider audicence to enable deeper contributions and support deliberative debate"* [48, p 2]. e-Participation, in e-PB projects, can open for easier access to political processes and support participation through a range of technologies. It can support all-to-all communication, instead of one source, e.g. mass media, and enable easier access and a better format to understand large quantities of information. It can promote the possibility of broadcasting (wide audience), narrowcasting (selected audience) and have decentralized control of information, where citizens are able to publish information themselves [33, p 27-28], [48, p 2]. The positive outputs of all-to-all communication and decentralized control of information, is today a debatable topic in regard of the creation of "fake news" by normal citizens [10]. Other positivist perspectives on e-Democracy can be found in the OECD report [56, p 33], which mentions the possibility to produce better quality policy, build trust, gain acceptance of policy and to share the

responsibility with the policy-making [56, p 33]. Additionally, the potential *"to visualize policy, to give citizens means to supervise government and policy implementation, to balance the power of lobby organisations, to avoid corruption, to foster active citizenship"* [56, p 33] is mentioned. These perspectives are as well applicable to e-PB projects.

Pessimist represents the contrast to the optimist view of e-Democracy by discussing problematic consequences. One of the most important pessimist perspectives of e-Democracy, is the possible weakening of equality. While technology can be an enabler of better equality amongst citizens, it might also weaken those who have less resources. One of the most prominent pessimist view is linked to the digital divide, presented by Pippa Norris [54, p 1]. The fear is that more ICT in democratic processes might widen the divide, *"...which, accompanied with ongoing socio economic polarisation, could sharpen social inequalities..."* [51, p 31]. Golding and Haywood define the lack of access to ICT, and ICT literacy [43, p 9] as problematic sides of e-Democracy projects. Those who already have ICT resources and knowledge might take advantage of those who do not have such powers. This means an increase of political inequality amongst different groups of citizens [65, p 33]. In an e-PB project context, this means that only some of the citizen's opinions are considered, because the digital illiterates do not know how to contribute. Another pessimist point of view is related to how governments and political parties will use e-Democracy tools to gain popularity and votes. In a report by Hopp and Vargo [34], the use of big data for advertisement purposes during the 2012 U.S. election was studied. They found that *"(1) heightened levels of negative campaign advertising would be associated with increased citizen activity on Twitter, (2) increased citizen activity would predict online incivility, and (3) that increases in citizen activity would facilitate a positive indirect relationship between negative advertising volume and citizen incivility"* [34]. In an e-PB context, the use of big data might shape the public opinion, is a concern. This means that the prioritizations of the public budget can be shaped by rich and resourceful people. Custom made advertisements for specific groups of citizens can be used to secure a majority vote for a specific project.

A pragmatic view on e-Democracy, does not see the technology as solely posing any threats. This is because the technological means for e-Democracy are integrated and

transformed by stakeholders and existing systems [65, p 34]. It is the context the technology is used in, that might be good or bad, not the new tools itself. Krimmer [43] states that *"...it was not the lack of inclusiveness that hindered e-democracy from developing as quickly as e-commerce or e-government had"* [43, p 9]. This gives us a hint that key stakeholders in politics fears the emerge of e-Democracy because of the potential of losing power. This is further described as the "middleman paradox", where politicians have less incentives to use technology tools for more e-Democracy, because it can make them less relevant [49]. An e-PB project can lead to negative consequences, but this is not because of the technology itself. The project will always be formed based on the current political landscape, systems and institutions. This might as well relate to the level of influence the project will have on the budget and local government.

3 Methodology

3.1 Research question

Based on the article by Chadwick [14], one can reflect upon the lack of e-Democracy focus, compared to digital improvement of general local and national e-Government services. If there are not added more democratic practices of governance [11], the ideals of better e-Democracies will not be reached. The background and literature review chapter states that there are several different ways to conduct an e-PB project, based on e-Participation, e-Democracy features, and its potential and limitations. Based on the different articles and reports, one can see a research gap in the holistic framework of what key e-Democracy features an e-PB project should produce. The driving forces of this thesis, have been to generalize these key features. According to Yin [71], a case study is appropriate when the focus is to answer a "how" or "why" question. This applies as well to when a researcher cannot manipulate the behavior of those involved. The third aspect is to understand the contextual contemporary conditions of a phenomenon. The research question of the thesis should answer how to design an e-PB projects with more e-Democracy features, to improve the citizen's interest and participation in the project. It has not been possible to manipulate the behavior of those involved and the contextual conditions of each project are important. To better understand e-PB projects, different research methods would also be possible. Such as conducting an experiment on different users or creating a survey [62]. A different approach could be to use action research or a design science approach. This is often used with the purpose to change or improve a process for information systems [62]. A qualitative approach of case study research is a common and well-established method used in both a social science and information system research [61]. To find ways to improve e-PB projects, both approaches are important. To strengthen inclusion, governance and legitimacy, social science research is relevant. The research of the administration and technological perspectives are the information system research equally important. Because the focus of this thesis is to generalize key e-Democracy features and make e-PB projects more relevant, a qualitative case study research method seems to be the best alternative.

From these reflections, one can derive at one main research question. The aim for the research question is to close the research gap, by answering key e-Democracy features to make e-PB projects more relevant.

Main Research Question: How can the citizen's interest in e-Participatory Budgeting projects be improved? The theoretical framework, based on different authors, reflects the ideal values or key features an e-Democracy projects. This is to demonstrate what the e-PB project need to generate, to increase the democratic practices of governance. The theoretical framework will be compared to three cases, to evaluate at what levels patterns of the key e-Democracy features are present.

Sub-question: How can projects be designed to help increase the democratic practices of governance? By creating a framework that allows us to compare different projects, it will be possible to indicate which e-Democracy features that can improve the popularity of the projects.

Sub-question: How can financial externalities be viewed as a reason for low citizen interest? From the theoretical framework, funding of each project was mentioned. To control the validity of the main research question, the total size of each budget will be evaluated as an influencing factor.

3.2 Case study design and methods

Based on the literature review and the new theoretical framework, a qualitative case study of the three e-PB project is possible. This is to better understand how the projects have performed and if key e-Democracy features are present or missing. Yin [71] points out that case study focuses on a *"contemporary phenomenon within its real-life context"*. It has many variables of interest, multiple sources of evidence and a theoretical proposition to guide how the researcher collect and analyze the data [71]. He divides the types of case studies into categories of explanatory, descriptive and exploratory. An exploratory research strategy tries to find out what is happening, by seeking new insight, generating ideas and hypothesis [62]. The descriptive strategy aims at *"portraying the current status of a situation or phenomenon"* [62]. The explanatory strategy seeks to explain a situation or a problem [62], with the end goal of constructing

a new theory or gain increased understanding [72]. Gaining new insight and explaining the situation of e-PB projects will be the aim for this thesis, and an explanatory strategy will, therefore, be used. To conduct and define how the research will be done, a research design is needed. Yin [71] defines the components as *"a study question, its propositions, its unit(s) of analysis, the logic linking the data to the propositions, and the criteria for interpreting the findings"*. The study questions in this paper has been defined by asking "how", which makes an explanatory a case study the most relevant research strategy. Stating the study propositions helps to *"direct attention to something that should be examined within the scope of the study"* [71]. In our case, the scope of the thesis has been narrowed by studying the features an e-Democracy project should generate. This was done to better understand the concept of adding *"more democratic practice of governance"* [11] to a project. The third component, the unit of analysis, is used to define what the case is, or in a multiple-case study defining what the cases are. Because the research objective is to find the needed features to make e-PB projects successful, the unit of analysis will be the key e-Democracy features, rather than the project itself. Linking data to proposition is about matching information to different patterns derived from the scope of the study [72]. The last component is about having criteria for interpreting the findings. This could be to validate relevant findings to the study proposition. This thesis aims at analyzing three cases of e-Participatory Budgeting projects, from three different contexts. One project from Norway, one from Germany and one from Estonia. Because an actual research sampling has not been possible, a theoretical sampling has been done instead. This was done to compare and contrast the findings of the theoretical framework. The cases have been chosen because of their self-proclaimed status as successful e-Democracy projects, in their respective contexts. Another feature has been the relative size of each study object. Even though the German case has many more inhabitants than the two other cases, it has the similarities of being a small unit compared to its national context. All the cases come from areas with relatively stable political institutions and processes. The sample have limitations due to its theoretical nature, which includes the risk of having ambiguous end results. Two of the cases are located in Northern Europe, while the second one is located in the northern part of Central Europe. A multiple case study is possible in this thesis, because it is assumed, by the author, that geo-political conditions will not produces much variance in the phenomenon studied. A multiple-case replication design has been used, by examining the cases by the same theoretical framework. Yin [71] describes that *"the*

individual cases within a multiple-cases study design may be either holistic or embedded". Because of the similarity of the different cases, a holistic approach will be used.

3.3 Collection of data

The collection of data for a case study can be done from different types of sources. Yin [71] defines six of the most common ones as: *"documentation, archival records, interview, direct observation, participant-observation and physical artifacts"*. For this thesis, three of the six sources have been used: documentation, archival records and interviews. Documentation and archival records were mainly available through the websites and publications by the projects.

The desk study of documentation and archival records was supplemented by interviews with the administrators and citizens in the e-PB projects. In March and April 2017, six interviews were made, two by face-to-face meetings, one by Skype and three by email. The main reason for the email interviews was based on the preferences of the interviewees. To avoid the potential of having biased sources and a lack of rigor case studies, a triangulation by using multiple sources of evidence have been made [71]. The data triangulation was made by getting documentation from statistics, reports and other sources, while interviewing both system administrators and users. The head of democracy development in the municipality of Fredrikstad, Camilla Eidsvold, was interviewed to better understand how the e-PB projects were conducted. Hilde Naeimi Nilsen was interviewed as one of the users in the skateboard e-PB project. In the Lichtenberg case study, one of the administrators, Lilia Lengert, was interviewed. This interview was made by email because of language barriers. Because of privacy regulations interviewing a participating citizen was difficult, therefore, Hans Hagedorn from the company creating the e-PB system solution, was interviewed by Skype instead. To get a deeper understanding of the Tartu e-PB project the head of public relations and the e-PB project, Lilian Lukka, was interviewed. To understand the citizen and participator view, one of the project winners, Lemmit Kaplinski, was interviewed by email. As an analytical technique, pattern matching can be used for explanatory case study [71]. For this thesis, the patterns will be compared empirically based on expected e-Democracy features, to see if the initially predicted results might be found.

3.4 Hypotheses

Based on the theoretical framework of key e-Democracy features, the research questions and the chosen case studies, the thesis hypotheses can be made. The articles in the literature review gave specified e-Democracy features, which applies for e-Democracy instruments such as e-Participatory Budgeting. The generalization from the theoretical framework gave four main categories of key e-Democracy features: *"Inclusion", "Governance", "Administration"* and *"Legitimacy"*. To test the validity of these categories, the e-Democracy features of the case studies will be used as units of analysis. Through the research questions, the correlation between citizen's interest in e-PB project and the categories of key e-Democracy features, are described to fill the research gap. As a control feature, the total size of budgets, for each project, is used as a qualitative control variable. This leads to the following two hypotheses:

H1: e-Participatory Budgeting projects lacking key e-Democracy features will receive lower interest by citizens than projects with several features present.

H2: There is a correlation between low funding and low participation in e-PB projects.

4 Case Studies

Based on the theoretical framework, three e-Participatory Budgeting projects will be used for the case study. The analysis of each case will be based on the key e-Democracy features of inclusion, governance, administration and legitimacy. The cases have the same characteristics as e-PB projects, but have been conducted in different cities and, thereby, contexts. The first case is from a south-eastern city in Norway called Fredrikstad. The case sample is chosen because of its relative size compared to the other cases. The effort to digitize public and democratic services, is a goal for the Norwegian government and the city of Fredrikstad was a part of the pilot e-Voting project [4], [25]. These aspects make the city a good unit of analysis, based on its context, for the theoretical research sample. The second case is the eleventh district of Berlin [5], named Lichtenberg. Since 2005, the district has aimed for more citizen inclusion through letting citizens submit suggestions for district renewal projects. With the German federal structure, democracy focus and the relative size of the district, compared to the city of Berlin, the case fits good in the theoretical research sample. The third and last case is from a southern Estonian city, called Tartu. Compared to the relative size of the other cases and the Estonian e-Democracy tools, such as e-Voting, the case matches the theoretical research sample. The e-PB projects will be used to compare patterns of the key e-Democracy features, categorized in the theoretical framework. To learn from each case and verify the patterns of the theoretical framework, each key e-Democracy feature category will be rated from a high, medium and low score.

4.1 e-Participatory Budgeting Fredrikstad (Norway)

The municipality of Fredrikstad is located in the south-eastern part of Norway and have around 80'000 inhabitants [25]. Since 2009 the municipality has held 3 rounds of participatory budgeting, with a mixed use of e-Democracy tools. This means that not all of the cases can be classified as real e-Participatory Budgeting projects, but are included in this analysis to enable a comparison for the other case studies. The projects are created sporadically and individually with no repetitive annual timeline, such as other e-PB projects. The aim for all the projects have been to include the "silent voices" of the community and, therefore, had a special focus at youths, immigrants and elderly [25]. In all the project rounds, the municipality have decided the topic and the size of the

budget. The citizens have been invited to design different suggestions for the planned project. In the first project in 2009, the budget was 200'000 kroner (approx. 21'000 euros), and 13-19 year old citizens suggested and voted for how is should be spent [25]. The second project was done in 2013, where 200'000 kroners was budgeted to design and vote for a new skateboard arena [25]. The third and last project was in 2015, where 1'000'000 kroners (approx. 107'000 euros) was budgeted to renovate a town square, in the district of Fredrikstad with the lowest living conditions, according to the living index of the municipality [25]. This part of town is mostly populated by immigrants and elderly. All the projects have been supported by the Interreg Europe Funds [25], which is an EU agency for regional and local development [36].

4.1.1 The e-PB process

In the first project, youngsters in the municipality was asked to come up with suggestions on how to spend 200'000 kr. The suggestions could be submitted and displayed at fredrikstadvalget.no. The student's suggestions were controlled by an expert committee, and later voted for on paper by the students. The aim of the project was to learn how ideas can be turned into real projects [73]. The second project in 2013 was done as a proper e-PB project, where youth between 12-30 years could participate in suggesting, designing, voting and constructing a new skateboard arena [25]. The project used a Building Information Modeling (BIM) software, where the contributors could drag and drop 3D modeling elements to design their own skateboard arena [25]. By using this software, there was an automatic visualization of the budget, which increased or decreased by adding and removing elements. This increased the creativity of the project and enable a better understanding of the budget [52]. The voting was done electronically at http://fredrikstad.demokratiportalen.se, where users signed up by registering their email address [25]. The winning project was built by the local skateboarders [52]. The 2015 participatory budgeting was done offline by inviting people to join the process of renovating the town square of Trosvik. By raising a circus tent in the square and serving hot food, people took part in the designing and voting process.

4.1.2 Outcomes of the project

The 2009 project resulted in 11 ideas submitted and 5 of those ideas passed the analysis / policy formulation stage. On average, the voter turnout was 61 %, and the winning

idea was to host a computer gathering [25]. In the 2013 e-PB project, 5 ideas was constructed by using the design software and voted for online. There was only 30 people participating at the design stage of the process [25]. The skateboard arena was built based on the plans from the e-PB by the local skaters. In the 2015 project, the objective was to renovate Trosvik square 7 suggestions was submitted and thereafter shorted down to 3 projects in the analysis stage [25]. Around 500 people participated in the process, with many children from 5 years and older [25]. All the projects have been completed.

4.1.3 Project analysis

Based on the policy-making cycle, only some citizens were included in several of the different stages of the project. The first step, agenda-setting, was controlled by the municipality, which has been the initiator of all the three projects. For the analysis and policy formulation stage the citizens have had a role as designers for the preselected topic. The citizens are not solely responsible, as all of the projects are evaluated by an expert committee for the feasibility study [25]. The third step, decision-making, the citizens had an explicit role in deciding which project that should win. The implementation step has been completed by the citizens in the 2009 and 2013 project. In the 2015 project, the citizens were not included for this step. For the last and fifth stage, evaluation, no explicit role was made for the citizens. Because only one of the projects have been a real e-PB projects, the 2013 example will be the main focus. The case had no inclusion of the citizens in the agenda-setting, but rather included the citizens in the analysis and policy formulation stage. The citizens were asked or consulted by the municipality on a specific matter, which qualifies the project for the Liberal e-Democracy project category. This category is characterized by a top-down approach, where the aim is to generate a better decision-making process, by increased input by the citizens. The citizens voted as a part of the project, but mainly based on preselected ideas from the expert committee. For the fourth step, implementation, participants had an explicit role. The idea to have more citizen input to generate better quality in policies is compatible with the strong e-Democracy model, where the aim of the decision-making process is to be slow and, therefore, more resource demanding, to include all perspectives. The e-PB project can, therefore, be characterized at the e-Engaging level of the e-Democracy categories. This means that citizens are regarded more as policy

consumers than policy producers, mainly because there are no options of suggesting own ideas for projects.

The Fredrikstad case had *"listening to the silent voices"* [25] as an aim for the project. This leads to a medium level of inclusion features. It succeeds at including the small group of people it is intended for, but are thereby blocking out other citizens, who might have an interest in the topic. The project succeeds at including the citizens in three of the policy-making cycle steps, and is at the e-Engaging stage. By including more citizens the level of inclusion features would be even higher.

The governance features of the project are present at a medium / low level. The production of better quality policy is enabled through greater information exchange about the citizen's needs, but only ad hoc processes of policy implementation are present. By having expert committees, the project facilitates an analysis of all contributions. This is furtherly increased by the use of the design and budget visualization software, where the citizens were invited to build his or her own model. The citizens have access to different stages of the decision-making process, but has a low level of influence of the agenda. The framework of evaluation is based on political and social perspectives, by choosing a fixed group of citizens, and letting them express themselves through digital means. The level of shared responsibility is low due to the preselected topics and the few interest groups included in the process.

The administration features of the case are at a medium / low level. Most of the projects have had a low technology level, where the digital tools have been used as information channels. It does provide some Web 2.0 tools, such as e-referenda and the budget design software, but are lacking the cost effectiveness aspect. This is because it still is heavily dependent on human interaction and manual analysis of contributions. There was no identity check using e-IDs [25], which would prohibit the citizens from creating fake user accounts. There have been no specific improvements of knowledge management, since all of the project have been done sporadically with no continuous overall structure.

The legitimacy features of the project are at a medium / low level. Only certain stages have been transparent and open for citizens outside the project. Through the project, citizens have been able to provide relevant and appropriate feedback, generated more

engagement in groups which normally do not engage themselves, and therefore more people can gain an enlightened understanding of democratic processes. By giving the "silent voices" a better chance at expressing themselves, the level of conflict might decrease and consensus increase. To involve those who normally are left out of the public debate, a greater level of enlightened understanding of the political processes might be reached. This effect can be seen from a policy legitimacy perspective as well.

4.2 e-Participatory Budgeting Lichtenberg (Germany)

The first e-Participatory Budgeting (e-PB) project implemented in Lichtenberg was in 2005, and the project is still ongoing [44]. There is no specific start or end, the project lasts the entire year, allowing the citizens to come up with suggestions for different projects [9]. The project does not have *"its own budget sovereignty, but gets the money made available by the Senate of Berlin"* [44]. The total budget is 670 million euros, where approximately 32 million are made available for investments in the district [44]. From this budget, the e-PB project can apply for funds. Through the project, the citizens can be a part of designing the district's cooperation, development and decision-making processes [9]. One of the project goals have been to increase openness and dialogue between the politician, administration and citizens. Approximately 283'000 citizens live in Lichtenberg [44].

4.2.1 The e-PB process

There are several ways to participate in the Lichtenberg e-PB project. Ideas can be submitted by regular mail, at events, at the district office and through the e-PB online system, called: burgerhaushalt-lichtenberg.de [9]. All suggested ideas are made available in the web system, regardless of submission form. Each idea get its own sub-page, and is geo-tagged to point out the position on a map. At the specific idea page, people are able to leave comments and see the current status of a project [31]. Depending on the financial size of the project, ideas are discussed by the district administration or by the local politicians. There is a fund called "Der Kiezfonds", specifically designed for financial support of small scale project in the district area [40]. To strengthen cooperation and beautify the neighborhood, is one of the main aims. A jury, in the district office, divides and prioritizes payouts for the fund, which is currently at 10 000 euros in 2017 [40]. For suggestions which does not apply for the

neighborhood fund, there is a normal public budget process, based on input by local politicians and the district administration. The decision phase is, as far as possible, documented in each of the project idea pages online [31].

Allowing the citizen vote directly for different projects is not a part of the standard process of the e-PB project, but has happened occasionally. The last time such a voting process took place was in 2014, where 18 proposals were listed [44]. All citizens got 5 votes each and the top 10 out of these ideas was then sent to the Lichtenberg local assembly for final approval. The citizens could vote online or in the district administration office [9]. The e-Voting was made possible through the user accounts of the e-PB system. To apply for voting rights, the citizen had to state *"their full name and postal address"* [31]. The system only accepted zip-codes from the Lichtenberg area and the administrators checked manually for fake accounts by checking the official register of residents. Hagedorn, the system developer of the project, stated that: *"In all years, misuse could be limited to a few percent"* [31].

4.2.2 Outcomes of the project

Since the beginning in 2005, the Lichtenberg e-PB project has been running constantly, except for a development phase in 2012 [20]. There are currently 3436 users registered in the system [44], with the steepest growth between 2005 and 2011 [20]. Since 2011, the system has only gained 245 users [20]. There are approx. 283'000 citizens living in Lichtenberg [5], which makes the total amount of system users 1,20 % of the total population. During the first 8 years of the project, the quantity of suggestions was high, ranging between 182-378 ideas annually. Since 2014, the amount has declined to 27-80 suggestions annually [20]. The same decline is visible in the number of comments. The average number of comments was 248 annually between 2005 and 2013. This number decreased to only 30 comments on average between 2014-2016 [20]. According to the e-PB platform, 475 ideas have been implemented, 342 rejected and 43 still pending, since 2005 [71]. The most expensive project was a sport complex rehabilitation, constructed in 2015 with a total cost 200'000 euros [44]. The election made in 2014 was attended by a total amount of 2920 citizens. Approximately 1/3 voted online, while 2/3 attended through offline means [44].

4.2.3 Project analysis

The Lichtenberg project has a medium level of the inclusion features visible. Regarding the policy-making cycle, citizens of Lichtenberg are included in two of five steps. Citizens can take part in the agenda-setting stage, through submitting ideas online or by mail. The second stage of policy formulation, the citizens can influence through making comments on each idea web-page or through joining citizen juries in the district office. For the decision-making stage, citizens have occasionally been included, like in 2014. These elections are sporadic and the final decision are made by the district council. Citizens have, therefore, no explicit role in the decision-making process. The implementation and evaluation stage is controlled by the local politicians or the district administration. The goal of the project to include citizens, and thereby enable more innovative solutions for the district. Equality in voting is partly present, because of the sporadic elections, but the selection and implementation most of the suggestions, are made by the local administration and politicians. These features can be connected to a deliberative e-Democracy model. Even though the political processes might be slowed down by including the citizens, the deliberative gains can be seen as higher. The focus is to enable a richer discussion and larger set of ideas. These features can be connected to the strong e-Democracy model. By regarding the citizens as policy producer rather than policy consumer, the Lichtenberg e-PB project can be classified at the e-Engaging e-Democracy level. Because the citizen inclusion is limited through a top-down approach, the higher levels of the model are not reached. Based on these specifications the Lichtenberg e-PB project is at a medium level of inclusion.

The project has led to citizens submitting new and innovative ideas. By having well defined processes of reviewing these suggestions, the level of the governance category is increased. The level of better governance features, are visible at a high level, based on the categories of the theoretical framework. The project facilitates an analysis of all contributions, through the evaluation process of submitted ideas. A majority of the projects are being implemented and there are standardized processes of implementation. The citizen's ability to control the agenda have increased, but the access to the different stages of the decision-making process is still limited. Based on the different criteria the project has a high level of governance features visible.

The third key feature, of more efficient administration, is at a medium level of visibility. The e-PB project has introduced new technological tools to engage the citizens, but most of these tools are limited to the Web 2.0 level. By developing a proper e-ID system, and eventually e-Voting, the administrative costs would decrease. On the other hand, the possibility of letting people submit ideas and follow the status of the submission online have increased the administrative efficiency. The website has had a focus on increased accessibility, usability and user experience [31]. One of the goals is to allow all ages to use the system. By saving all suggestions online, the systematization and improvement of knowledge management is increased. This way politicians and citizens can get inspired by the new ideas. The technology means used in this project are notification services, search engine, geo-tagging, discussion or comment functionality and email newsletters. The elections held, has the form of e-Referenda, due to the fact that the district council is the final authority. It is not based on e-ID technology, and can therefore not be classified as e-Voting.

The level of legitimacy features, and transparency, has been increased compared to a normal political decision-making processes. All ideas receive a process status, where the citizen can monitor the progress, comment or complain. This might lead to increased trust and acceptance for a policy. Through the comment function, the citizens can provide relevant feedback. With over 200 suggestions each year, before 2014, indicates that the project did increase the engagement. The project does not have an explicit focus of enlightening the citizens, by including them in the decision-making. With only some of the processes open for the public, the project is characterized at a medium level of legitimacy features.

4.3 e-Participatory Budgeting Tartu (Estonia)

The City of Tartu, decided in 2013 to launch an e-Participatory Budgeting project, allowing its citizens to design, propose and vote on how to spend 1% of the city's investment budget [41]. Initially, 140'000 euros was the equivalent of 1% of the investment budget, but the total sum was increased to 150'000 euros in 2016 [16]. One of the key enabler of having the participatory budget as an e-Participation project, was the possibility of using Estonia's e-Voting system [41]. e-Voting has been possible for all Estonians with the use of an ID-card since 2005 [71]. The project has been a part of a

"broader initiative to raise awareness of local governance and encourage broader engagement" [55]. The goals have been to better explain the logic of the budget, to increase the understanding of how decisions are made and increase the co-operation between communities [46]. Additionally, the aims have been to increase discussions among all stakeholders and readiness by the citizens to take part in the activities of the city [55]. The e-Participation platform is developed and hosted within VOLIS, which is the Information System for the municipalities [41]. All citizens who are above 16 years old and live in the City of Tartu can participate in the online election. The total population of Tartu is 93'000 inhabitants [67]. The maximum cost per project is 75'000 euros. There have been made 4 e-participatory budgets since 2013 and the project is still ongoing [46].

4.3.1 The e-PB process

The first stage of the project is the idea submission stage. All citizens are invited to suggest ideas for new investment projects for the city. The submissions are done through digital means, but it is possible to use regular mail as well. This last alternative is rarely used [46]. There is a possibility to submit the ideas anonymously, but *"the whole point is that the proponent is part of the process"* [39]. This means that the ideas are discarded in the analysis stage, if the author is not present. The second stage is a discussion phase, which starts when the idea submission phase ends. All ideas are presented in the VOLIS system, where citizens are able to leave comments. Expert groups are formed by the administration, local experts and the authors of the ideas [46]. There will be an elimination of ideas before and after the discussion phase [16]. In the last three e-PB projects, this process has resulted in 24-25 ideas. Based on these, the citizen can vote for their favorite. The reason behind the elimination process is to ensure the feasibility of the project and make it more comprehensive for the citizens [46]. At the third stage, the remaining authors promotes their ideas to the public. The fourth stage represents the actual election. The voting session lasts for one week and the two ideas with the most votes are implemented [46]. For those who are not comfortable with voting from home, there is an option to vote through smart screens at the city's information center. The smart screens are directly connected to the e-Voting system and the citizens are using their ID cards for the automatic digital authentication [46]. When the vote ends, the results are published in the VOLIS system [46]. The city council is the responsible authority for the implementation of the project.

4.3.2 Outcomes of the project

Since the project began in 2013, there has been held 4 e-PB project rounds. In 2013, 158 ideas were submitted, 92 ideas in 2014, 57 ideas in 2015 and 87 ideas in 2016 [16]. There has been a decline in the number of ideas, but the quality of each idea has been increased, according to the head of project Lilian Lukka [46]. 74 projects were put to vote the first year, but for the three last years this number has decreased to 24-25 ideas. In 2013, 2645 persons voted for their favorite idea [16]. In the three last elections, all voters were given three votes each and the two most popular projects were realized. In 2014, 1938 persons voted, 3772 persons in 2015 and 4178 persons in 2016 [16]. The voter turnout was 3.3 % in 2013, 2.4 % in 2014, 4.7 % in 2015 and 5.2 % in 2016 [16]. These numbers are based on the total population of Tartu within voting age.

The total participation in the project was lower than anticipated, especially the first years, seen from the administration's point of view [46]. The first ambition of the project was to increase the understanding of the city budget process. This educational part is the hardest one, according to Lilian Lukka. Lemmit Kaplinski, who has been an author of one idea in the project, thinks that to reach the first goal is *"the current process suboptimal"* [39]. The second target, of improving cooperation between the communities, have been partly realized with the creation of projects which have brought different people together [46]. The third goal of finding good solutions to practical problems has been reached according to Lukka. Kaplinski agrees with Lukka by stating that the current process *"works remarkably well for [aim] 2 and quite well for [aim] 3"* [39].

Most of the winning projects have been realized, except for two "problematic" ideas. One of the ideas was to create a *"semi-natural amphitheatre for public events and concerts at the foot of Toome Hill"* [46]. The idea turned out to be more expensive than the budget allowed for, and has therefore not been realized yet. The second problematic winning idea was a feasibility study of a new sports arena. Many citizens did not understand that the suggested project was a feasibility study, and thought they were voting for the actual building of the arena [46]. According to Kaplinski, there have been argued that this might be against the rules, *"in that the result has to be an investment"* [39].

4.3.3 Project analysis

For the inclusion features, the Tartu case has a high level. Seen from the policy-making cycle, the Tartu e-PB project includes the citizens directly in three of the different steps. In the first stage, agenda-setting, the citizens have had an explicit role by submitting ideas and setting the agenda. The second stage, the analysis and policy formulation, invites the authors of each project, along with experts and representatives from the municipality. Voters are not included directly in this process, but are able to influence by leaving comments online [46]. The third stage, decision making, gives the citizens an explicit role as the decision-makers of the winning projects. In the last two stages, the implementation and the evaluation, the citizens have not any direct role, but might influence through normal channels, such as regular and social media [46]. The Tartu e-PB projects gives the citizens an explicit role of the budget process, by involving them in several of the steps of the policy-making cycle. One of the aims of the project has been to educate and increase the understanding of how the city budget process works and create better discussions. However, the project is initiated and controlled by the local government. By these specifications, the project can be described as a deliberative e-Democracy project. These features match as well the strong e-Democracy model, where the aggregated discussion generated by the project is the final goal. The citizens are seen as policy producers, more than policy consumers, which means that it can be classified in the representative e-Empowering category. The e-Voting feature gives the project some direct democracy features, but since the expert committees can discard suggestions, the representative model fits better.

In regard of better governance features, many of the key elements are present in the project. The project is classified at a high / medium level. Both Lukka and Kaplinski thinks that the project produces better quality policies, by having a good information exchange between the authorities and citizens. The project facilitates a better analysis of all the ideas in the discussion phase and by the expert committees. The process of decision-making and implementation is easy to monitor by set conditions and online engagement tools, such as comment functions and information pages.

For the administrative features, the project is at a high level. This is due to the technological tools available through e-ID and e-Voting. By using Web 2.0 tools,

contact and engagement of a wider audience is easier. Not having paper elections increases the administrative efficiency, as there is no need to count all of the votes. This leads to an administrative cost efficiency, where the total amount spent on promotion and administration is limited to 8'000 euros [46]. The project provides for an improvement of knowledge management, because the politicians have access to a database of suggestions for improvements in the city. On the negative side, according to Kaplinski, the usability and usefulness of the VOLIS system is low [39]. There would be a need for an upgrade of the system. The Web 2.0 tools in use are for example e-mail newsletters, discussion forums and options for comments. The decentralized tools used are e-ID and e-Voting. These features increased the administrative efficiency of the project, and is the reason why it scores at a high level of administrative features.

For the legitimacy features, the project is at a medium level. Central features of this category are present, such as generating engagement and providing feedback on matters that concerns the citizens. The transparency and openness of the project is limited to only some of the stages. There are limited possibilities for the citizens to give feedback about the project. The feature of building trust and gain acceptance for policies is partly accomplished by the facilitation of collaboration between different groups of citizens [39]. This might enable a better environment for conflict and consensus. On the other hand, the educational part of the project has not succeeded, which might lower the building of trust and gaining acceptance for policies. To gain more enlightened understanding has, therefore, not yet been reached.

5 Discussion

Compared to other e-Government services, the ambitions of e-Democracy are far from reached, Chadwick [14] states. To actually improve and make a difference, e-PB projects are required to add more democratic practices of governance [11]. By generalizing different authors views of key e-Democracy features, a comparable case study was made possible.

Based on the analysis of the Fredrikstad case, one can conclude that the groups who the project was aimed at, experienced more inclusion, better governance and more legitimacy for policies. The overall administrational efficiency remained at a medium / low level, because of its dependency of human interaction. For the citizens outside the project focus groups, the projects had little or no effect. To have a real impact, the project should be structured as an annually repetitive e-PB systems, where all citizens are invited at the agenda-setting stage of the process. There would be a need for an increase in the budgets devoted to the project, to provide a real change. Because Norway already have several e-ID systems [53], this should be included to provide a proper e-referenda system. The Norwegian e-Voting pilot project was discontinued due to the lack of *"improvements of speed and efficiency"* [4, p 4]. The municipalities participating in the e-Voting pilot had a turnout ranging from 19.8 % to 31.6 % [4, p 2]. This turnout was higher or at the same level as the Estonian e-Voting system at the same time [66, p 4]. To summarize, one can state that the Fredrikstad case had an impact on specific groups of the municipality, but the overall score for inclusion features are visible at a medium level. The governance, administration and legitimacy features are visible at a medium / low level. With more and broader inclusion, and the use of technological tools, a real e-PB level can be reached, increase the relevance of the project and generate real impact for all citizens. If upgraded, the projects e-Democracy features could gain more inclusion of citizens, by controlling the political agenda, more political equality, provision of more relevant information and the engagement of a broader and wider audience. This can lead to better quality policy, community control and more efficient administrations.

Since 2005, the Lichtenberg e-PB project has implemented 475 ideas suggested by its citizens. By submitting ideas, the citizens are able to set the public agenda at the local

level and occasionally vote for different preselected ideas. By commenting on each idea online, the citizens can, to a certain extent, influence the policy formulation stage. The overall inclusion features are at a medium level, because the citizens have no explicit decision-making role. The governance level is high, because of the standardized information exchange and the process orientation of policy implementation. The decreasing use of the system during the last two years, might be a symptom of citizens feeling left out in the prioritization and decision-making processes. The administrative cost efficiency has increased, based on people submitting and reviewing the suggestions directly online, without the need for humans to administer and publish every submission. This puts the administrative features at a medium level. The legitimacy and transparency of the process is made more open with the process status functionality. Still, only some stages are open for all citizens, and the enlightenment of citizens has not been prioritized. This defines the legitimacy features at a medium level. The project has been a success in terms of having new and innovative ideas for the district's development, but the decline in the recent years might be a symptom of citizens not feeling included. By using new technology and increasing the inclusion levels, the project might regain its popularity. To make more people submit ideas, the project might need to implement functionality that allows the citizens to decide which project to implement. On a low level, this could be done through including online citizen juries. To have a proper e-Voting system, letting all the citizens decide, would be costlier, but increase administrative efficiency and citizen inclusion. The e-Democracy features would be to build trust and gain acceptance of policies, while enabling shared responsibility for the policy-making. The Lichtenberg e-PB project has made an impact, but with decreasing numbers of users, the project might become irrelevant. With more use of technological means and citizen inclusion, the number of users might, yet again, increase.

Since 2013, the city of Tartu has had 4 rounds of e-Participatory Budgeting. The project lets the citizens control 1 % of the investment budget of 150'000 euros, divided by two winning projects. According to the policy-making cycle, the citizens are included in most of the processes. Still, there is a low voter turnout, compared to a normal local election. The highest participation was in 2016 with 5,2 % of the citizens voting. The participation has been lower than expected [46]. Most of the winning projects have been completed, except for two. One of the projects was found to be too expensive, while the

second caused confusion amongst the citizens, because it did not provide any new investment, only a feasibility study. The project includes advanced technological tools, such as e-ID and e-Voting. Yet, there are some problems with the overall platform, VOLIS, in regard of low user experience and usability [39]. For the inclusion features, the project achieves a high score. This is a result of the citizen involvement in several stages of the policy-making cycle and that the project has reached the e-Empowering e-Democracy level. The governance features are visible at a high / medium level. The high score is due to the information exchange provided by the project, while the medium score is due to the actual ability to implement the projects in a good way. This is because of the confusion about two of the winning projects. For the administration features, the project receives a high score. The efficiency generated by using new technological means, are high. The legitimacy features are at a medium level, because the transparency is not guaranteed in all stages, and that citizen enlightenment of political processes have not yet been reached. One can conclude that the Tartu e-PB project have much potential, based on citizen inclusion, the use of new technology and better governance. Because of the projects technology readiness, the use of new technology, such as IoT, big and open data, might be possible. This would provide the citizens with greater intelligence about the problems and opportunities of the municipality. This can lead to e-Democracy features such as more enlightened understanding, a more cost-efficient analysis of the suggested ideas, political equality and a better inclusion of all citizens. By letting the citizens monitor their surroundings in a more direct way, new and innovative ideas might be collected. To make such changes would require a larger budget than today. To increase political legitimacy and trust should be the final goal of the e-PB project.

By summarizing the scores of the different project, one get a holistic view of the overall performance. This is described through table 3.

	Inclusion	Governance	Administration	Legitimacy
Fredrikstad	Medium	Medium / Low	Medium / Low	Medium / Low
Lichtenberg	Medium	High	Medium	Medium
Tartu	High	High / Medium	High	Medium

Table 3: The overall levels of e-Democracy features of the case studies

H1: By this comparison, differences between the e-PB projects are more visible. The Fredrikstad e-PB project is at an overall low or medium level. The Lichtenberg case represents a medium overall level, while the Tartu project is a high / medium overall level. By dividing the highest number of participants to the total population of Fredrikstad, the highest turnout of citizens is at 0.63 %. In Lichtenberg, the turnout is at 1.20 %, while in the Tartu case was the highest turnout at 5.2 %. Generally, all the citizen turnouts are at low levels. But, when comparing the different cases, Tartu scores at a relatively higher level than the others. By comparing the ability to attract citizens to participate, and the overall score of the key e-Democracy features, one can recognize certain similarities. e-PB projects lacking key features of e-Democracy, might fail to attract citizens to participate. There might be external factors, which the theoretical framework has not included, that might affect the result. Still, by having a focus on key e-Democracy features of more inclusion, better governance, more administrative efficiency and a higher level of legitimacy, might result in more attraction from the citizens, and thereby become more relevant.

H2: One of the Fredrikstad projects received the equivalent of 107'000 euros, but because this project was not a proper e-PB project, the budget will be discarded from the overall comparison. The focus will be at the funding of the new skateboard arena, which was a real e-PB project. This project received the equivalent of 21'000 euros. Divided on the total population of Fredrikstad, this represents 0.26 euros per inhabitant. The highest funded, single, project in Lichtenberg received a total amount of 200'000 euros. Divided on the total population, this represents 0.71 euros per inhabitant. In the Tartu case, the total pot is split in two, which makes the highest spent amount of a project 75'000 euros. Divided on the total population of Tartu, this represents 0.80 euros per inhabitant. The construction cost index (CCI), used by the European Union (EU), indicates the relative price for new residential buildings [27]. By this index, one can see major differences in cost of construction in Estonia, Germany and Norway. Estonia is the cheapest country, with a relative score of 0.9 on the index for European countries, for 2015 [27]. Comparable, the relative score for Germany was 1.4 and Norway was 2.6 in 2015 [27]. This means that Estonia have a greater capacity to get more built per euro, than the two other countries. Comparing the single project funding to the percentage of participating citizens, the correlation between low funded single projects and low

participation in the e-PB project, might be plausible. The Fredrikstad case has the relative lowest funding and the lowest percentage of citizens participating. Comparable, Tartu has a higher relative funding, and a higher percentage of people participating. This means that projects with higher funding, might generate more relevance, and thereby, more citizen participation. Yet, this comparison is not based on the total budget devoted for the e-PB projects, which might be more relevant. Until all the case studies have a specific amount of funds designated for the e-PB project, like Tartu, this proper comparison will not be possible.

The least popular projects, of the case studies, are the ones with the least amount of e-Democracy features and the lowest funding. To understand why some projects fail to become popular and relevant to its citizens, might be answered by comparing these features. In an e-Democracy context, the value created by the new theoretical framework might be used to explain what more democratic practices of governance means. By designing a project, based more on e-Democracy features, an e-PB project might become more successful and increase the democratic practice of governance.

Seen from an optimistic view, the e-PB projects of this thesis have contributed to more democratic practice of governance, than with a normal representative democracy process. By letting the citizens take part in the decision-making process, the overall inclusion has increased. These positive features are related to the use of technology. The pessimistic view of using digital technology, mentions negative consequences, such as the digital divide and only some resourceful groups gaining from the projects. Because the overall level of democratic practices has been increased, regardless of the cases in this paper, such features have not been considered. Based on a pragmatic view, technology itself is not regarded as posing any threats. It is rather the context where the system is implemented that matters. None of the cases exceeds 5.2 % citizen turnout, something which is classified as a low number of participants. With attributes such as low funding and politicians still in control of a majority of the process, might point to political stakeholders as the reason behind the low voter participation. This would match the definition of the "middle-man paradox" by Mahrer and Krimmer [49]. If or when local politicians can see the implementation of powerful e-PB systems to correlate with their self-interest, the funding might increase. New technology poses a threat to the current system, which might explain why e-PB projects are designed in its current form.

6 Conclusion

During the digital revolution, many old public administration processes have been made digital through e-Government services. Despite this increase, established democratic processes have not seen the same renewal. Attempts to generate more democratic practices of governance have been made, which e-Participatory Budgeting (e-PB) is an example of. Having generalized a theoretical framework of key e-Democracy features, and the use of e-PB projects as an instrument, has led to a comparable analysis of citizen's interest to take part in the projects. By analyzing the work of different authors, a summary of the key e-Democracy features needed for the projects to become more relevant to the citizens, has been made. One of the ambitions of this thesis has been to increase the understandability of features that makes e-PB projects relevant to all citizens. This was done through deducing the four generalized categories of (1.) increasing the citizen inclusion, (2.) providing better governance, (3.) creating more efficient administration and (4.) more legitimacy features. To test if different levels of the key e-Democracy feature categories correlated with the level of citizen participation in e-PB projects, three case studies was made. The main goal of these case studies has been to answer the research questions of how the citizen's interest in e-PB projects can be improved. The second question has been to analyze how the projects can be designed to increase the democratic practice of governance. The assumption was that projects with several of the key e-Democracy features present, would have a higher level of citizen participation. To evaluate this assumption, the third research question was analyzed based the size of each project's budgets, to see if higher funding led to increased participation. This led to the hypotheses of: (H1) e-Participatory Budgeting projects lacking key e-Democracy features will receive lower interest by citizens than projects with several features present, and: (H2) There is a correlation between low funding and low participation in e-PB projects.

The case studies showed that e-PB projects with fewer key e-Democracy features, generally had lower citizen participation. The similarities between the cases and the theoretical framework can be used as arguments to state the relevance of the four categories of key e-Democracy features. The first hypothesis has proven to be correct, which means that more key e-Democracy features, can lead to more citizen participation and popularity of each project. To answer the main research question: the citizen's

interest of participating in e-PB projects can be improved if: (1.) The citizen has a more explicit role of the policy creation, through better inclusion, (2.) The level of governance is improved through better quality policy, information exchange and proper abilities to implement suggested policies. (3.) The level of administrative efficiency is good, using technological means of better inclusion. (4.) The level of legitimacy is sufficient through high levels of transparency, abilities to provide feedback and generating enlightenment of citizens. On the other hand, the case studies showed that the overall citizen participation for all the e-PB projects was relatively low. This can indicate that the theoretical framework does not take external forces, such as mentality of citizens, into account. This leads to the analysis of the third research question.

To control the patterns of similarity to key e-Democracy features and increased citizen's interest, the financial aspects of each project was analyzed. For the second hypothesis, the size of the budget was the only parameter. Through the case studies and discussion part of the thesis, correlations between budget size and citizen participation was found. The Fredrikstad case had relatively lower funding, compared to the other cases, and the lowest number of participating citizens. The Tartu case had the highest relative funding, and scored best. By these findings, one can state that the total budget of each project plays a role when it comes to citizen's willingness to participate.

Based on the comparison of the first and second hypothesis, a conclusion on what generates the most citizen participation in e-PB projects are ambiguous. To a limited extent, both having key e-Democracy features and great financial possibilities might increase the citizen participation. Because one cannot conclude on which of these external factors that plays the most dominant role, the theoretical framework of this paper, cannot single-handedly be used to design and improve future e-PB projects. Still, the framework gives some indications of what can increase certain aspects of citizen participation in e-PB project. Therefore, it can serve as a framework of inspiration of having more including, structured, efficient and transparent future projects.

To be able to use the theoretical framework in a more practical way, further research and case studies are required. An even more precise comparison would be possible, by examining e-PB projects within the same national context. Other aspects worth of further study, includes the more psychological features of the citizens.

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Appendix 1 – Blockchain technology for future e-Democracy projects

Blockchain technology represents a new way of building computer systems based on peer-to-peer networks, meaning between users or citizens. It, therefore, does not need centralization of information or intermediaries to control it. By Bauman et al. [2], the blockchain is defined as: *"...a database, where information is chronologically stored in a continuously growing chain of data blocks, implemented in a decentralized network in a way that creates data integrity, trust, and security for the nodes, without the need for central authorities or intermediators."* [2, p 7]. The blockchain is a *"permanent, distributed, digital ledger, resistant to tampering and carried out collectively by all the nodes of the system"* [1, p 2]. This means that the chain of information is not stored centrally, but spread amongst all users. Each transactions is *"automatically verified and recorded by the nodes of the network through cryptographic algorithm"* [1, p 2]*,* which eliminates the need to know or trust participants interacting. The blockchain technology is best known for digital currencies, such as BitCoin, but the possibility to *"enter into contracts without the need for intermediaries"* [2, p 7] opens for many other application areas. The technology behind the blockchain is complex and this appendix will, therefore, not describe it more in detail, but rather use it as a foundation for explaining tools which can be built with blockchain technology. Blockchain technology opens for a whole new set of e-Democracy tools, because of its ability of *"automation, transparency, auditability and cost-effectiveness"* and is *"capable to execute tasks without human involvement"* [1, p 3]. Such tools give an increased amount for power to the users or citizens. An example of a Partisan e-Participatory Budgeting project, can be a system where citizens donates money to be spent and distribute for a local project. It would need a transparent system which allow for project suggestion, discussions, voting and implementation. In a direct democracy setting is this as well possible, when including such a system to the distribution of the local government budget. Some of the most relevant tools for this is smart contracts and decentralized autonomous organization (DAOs).

Smart contracts are *"automatized, self-executing actions in the agreements between two or multiple parties"* [1, p 3]. Because blockchain technology provides the opportunity of executing tasks without human involvement, it can help in *"achieving non-repudiation and fact-tracking of a consensual smart-contract agreement"* [9, p 2]. This means that with smart contracts, citizens can make binding contracts amongst each other, directly through the internet, without having to meet. The contracts can be coded as self-executing actions, which means that after an e-Vote, actions can be made automatically without a third-party interacting. For an e-PB project, this would mean that a budget suggestion can be digitally decided, which would trigger the execution of a smart contract. In the most radical forms of direct e-Democracy projects, this will eliminate the need for a third party such as the local government. The citizens would decide, and the execution or ordering of the policy happens automatically. This could for example be the building of a bridge. After e-Voting, whether or not to build a bridge, the smart contract can either terminate the proposal or execute an e-Procurement to a team of engineers to start planning a bridge that would fit the purpose. To be able to do such an action, one would need an e-Democracy environment to make such a vote. For this the concept of Decentralized Autonomous Organizations (DAOs) can be used. One would as well need an e-ID for the citizen and an e-Voting system.

The technology behind DAOs was first made possible by the creation of blockchain technology. It was suggested by Vitalik Buterin, known as the creator behind the Ethereum blockchain protocol, in 2014 [8]. In his original description, DAOs are seen from a corporate point of view, such as Colony.io [3], but the logic behind can also be used to describe a future model for democracies [5]. To describe a DAO, one can say that it is a digital organization which manage itself through the use of *"...long-term smart contracts that contain the assets and encode the bylaws of an entire organization..."*, but *"...also heavily relies on hiring individuals to perform certain tasks that the automaton itself cannot do."* [4]. This means that through an online platform can the citizens control a specific policy domain, or in theory the entire society [7], digitally. This is described as a way of governance that *"can be achieved by recording transactions directly to a blockchain, reducing operational costs, while providing a more transparent and auditable trails of every decision"* [10, p 16]. A DAO can function as a debate forum, an e-Voting and a decision-making platform, through smart contracts. All citizens are included in the agenda-setting, policy-formulation,

decision-making and evaluation. The actual implementation will still require human labor, but through the smart contracts will the "job description" be formulated for the right institution or company, with no option of corruption or changes [7]. This would match what *"scholars have described as governance without government"* [1, p 13]. The technology behind the DAO can as well be used in the representative democracy model, where the citizens give their voting rights to another user in the DAO system [5]. The DAO will work like a normal democracy, but automate the role of the agenda-setting, voting and ordering of implementation. The local government then works as a proxy for the decisions made in the DAO.

The technology behind smart contracts and DAOs is still young. In 2016 a German company, Slock.it, created a DAO as an investment fund where the users could pay for a certain voting rights on where to invest. A programming mistake in the smart contracts lead to an exploit where a hacker withdrew 50 million dollar [6]. Most of the money was later recovered, but showed how fragile the new technology can be. For this paper is the new technology added as a way of seeing new and potential ways of e-Democracy and e-PB projects.

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Appendix 2 – List of interviews and questions

1. List of interviews

Eidsvold, Camilla - Head of democracy development in the municipality of Fredrikstad (Interview, audio recorded). Conducted: 10.04.2017.

Hagedorn, Hans - System developer DEMOS (Interview, audio recorded, Skype). Conducted: 30.03.2017.

Kaplinski, Lemmit - Participant and author of idea in the Tartu e-PB project (Written interview, email). Conducted: 05.03.2017.

Lengert, Lilia - Administrators of the Lichtenberg e-PB project (Written interview, email). Conducted: 12.03.2017 – 26.04.2017.

Lukka, Lilian - Head of public relations and the e-PB project in Tartu (Interview, audio recorded). Conducted: 14.03.2017.

Nilsen, Hilde Naeimi - Participant in the skateboard e-PB project (Written interview, email). Conducted: 25.04.2017.

2. Main interview questions

- How many citizens have been involved in the project?

- How can the citizens vote in the participatory budgeting process?

- How many alternatives that have been able to vote for?

- How long has the project lasted for?

- What kind of financial means the project involves (how many euros have been put aside for the citizens to vote for?) What have been the most expensive project so far, based on suggestions from the Participatory Budgeting process? How many euros did you spend?

- Do the system allow for other technical means, such as discussion forums, newsletters, e-voting?

- Which parts of the policy-making cycle are the citizens included in: (agenda-setting, analysis / policy formulation, decision-making, implementation, evaluation / monitoring)

- How can the system be developed in the future?

- Have there been any technical problems along the way?

Users:
- What would you say is the motivational factors for people to participate in the Tartu e-Participatory Budgeting project. What was your motivation?

- What was the impact of the project for you?

- Would you say that the project actually makes a difference for the citizens? Does it produce new innovative ideas, which leads to better governance? If so, in what ways?

- What can you (the user) say about the user experience of the system. Was it understandable and easy to use?

- Has there been any problems during the project. Technical or conflicts?

- Was it possible for you to submit the idea anonymously, or did you have to log in / give any contact details?