Chapter 3
Fundamental Aspects for E–Government

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ABSTRACT

The upcoming initiatives using ICT in the government process should strengthen the benefit of e-government in most countries. Since e-government among other e-related terms is a widely (interpreted) term, it is sometimes challenging to understand the objective and goals of an initiative. Therefore, in this chapter, the authors introduce and explain most e-government related terms. Even more, they outline some interesting initiatives and implementations to explain the benefits of using ICT in the government domain. Concrete activities are aligned to the terms to explain their practical use in a better way. The authors conclude with several challenges that arise when thinking of the implementation of e-government services. Overall, this chapter should give a good overall view of e-government and the related issues.

INTRODUCTION

E-Government is a current challenge in many countries, where the existing possibilities of ICT should be used to raise the government goals mostly in regards of their players such as the citizens or enterprises on higher level. It is not unusual in the mind of stakeholders to implement E-Government tools through such initiatives in the area of E-Government to decrease the paper work of public authorities, next to the provision of added value such as providing services to citizens and enterprises 24/7. But in most discussions to E-Government - especially in western countries - there is also the idea in mind to increase the engagement of citizens in the political process. Most countries deal with the challenge of an increased lack of interest in politics, mostly in the younger generation.

For many people the E-Government term is most likely related to that what the term e-Participation implies. This perception is in a way retraceable, as far as citizens are interested in getting a higher influence in the policy making process. In regards of the focus on electronic participation it needs to be distinguished between normal participation possibilities, e.g. voting for politicians or maybe candidate as politician or demonstrating for a specific issue, and how ICT can contribute to involve citizens in the entire political process. ICT provides on the one hand a couple of new possibilities, such as debating with citizens from all parts of a country, also the information gathering is easier and it allows – depending on the provided services in the specific country – to contribute to political debates in parliaments and councils, what, for instance, the e-petition platform[1] provides to German citizens. On the other hand there are also some limitations, it makes less sense to make an electronic demonstration, because is harder to get heard by politicians. So the way ICT can be considered in E-Government provides some new innovative and sustainable options, but in fact it do not provide just benefits, it comes along with significant limitations.

In this chapter we want to outline the E-Government topic in a more clear fashion. The term E-Government and related terms like E-Participation, E-Administration and E-Governance are widely used in relation to current activities of countries and some organizations to show their future oriented strategies. The more terms are used that sound similar the more it get complex to understand the differences and the major goals. These terms suggest more or less the same aspects and it seems that they imply the same goals, but indeed this is often not true. Therefore in this chapter we will introduce and explain the meaning of these words, and how they are related to each other. In the second part of the chapter we will focus on interesting initiatives and implementations. This should on the one hand provide a more practical picture of what E-Participation etc. is, and on the other hand how it allows to show established technology development that strengthens the benefit of ICT to achieve an improved (e-)government. We will conclude with the last section, where we will consider several challenges that arise when thinking of the implementation of E-Government services. Among other things we will take a closer look at ways to guarantee private data security and possible problems with the equality of citizens in an E-Government world.

E-GOVERNMENT AND E-PARTICIPATION

Before we outline interesting initiatives, we want to introduce the major terms and want to give an overview about E-Government. Our focus in E-Government lays on E-Participation, more precisely on how to gather citizens' opinions and ideas in the governmental decision making process.

Overview and Definitions

"Government has always been dependent upon technology" (Coleman, 2008). This statement admits certain modernity to governments, which often are perceived as technically rather backward. However, e.g. the possibility for governments to publish data via the Internet is given for already over 30 years (Sheridan & Tennison, 2010).

The public sector uses technical innovations concerning E-Government approaches and techniques only as a passive participant. But in contrast it acts as a major sponsor of science, where it rather takes a quite active role in the development of new technologies. Considering the development of the World Wide Web, we notice it was largely based on the results of government organizations: in 1993 agencies with scientific backgrounds, such as NASA, introduced the Mosaic browser and the Apache server. This was an important milestone in the history of the Internet. From this time on governmental usage of technological innova-

tions became more and more intense (Brandt & Gregg, 2008). In the future governments' capital investment for instance will promote projects in "Horizon 2020 - The EU Framework Program for Research and Innovation" (Horizon 2020).

The term E-Government (for electronic government, also digital government [Hovy, 2008]) describes the use of information technology by the public sector. This includes the use of the Internet by public authorities. However, E-Government also encompasses the automation of processes in the public sector in general, for example, digital identity cards that speed up identification processes (Heeks, 2005, p.4). But also online portals for civic participation or online elections are a part of E-Government.

In order to differentiate the various dimensions of E-Government, the terms E-Administration and e-Democracy have been established (Friedrichs, Hart, & Schmidt, 2002, p.107), and will be discussed below. The objective of E-Administration is to provide information services and other electronic services for citizens (Friedrichs et al., 2002, p.107). The term encompasses services supporting every kind of interaction between citizens and every governmental agency or authority. An example for E-Administration would be the possibility to request your passport online, or to obtain your driving license over the Internet. But not only services that allow you to process formalities remotely are part of E-Administration. There are also pure information services, such as the mobile app of the Federal Council of Germany. The advantage of all these internet services is the enhanced accessibility for citizens. On the one hand this applies to the business hours, which are extended to 24/7, on the other hand it is no longer necessary to be on site in a particular agency.

Friedrichs et al. (2002, p.107) define E-Administration as the handling of user-based services by public institutions based on information and communication technologies (ICT). This definition also includes offline, non-internet based services. A good example for this was the

Facilitating Administrative Services for Mobile Europeans project (FASME project, 2001) described by Oostveen & van den Besselaar (2004): the aim of this EU-funded project was to facilitate bureaucratic procedures for citizens moving from one EU country to another. In this project, the researchers planned to use smartcards to store official data regarding the relocating person as files certified by the native country. Once arrived in the new country, the project planned that only the smartcard is required -e.g. to take up residency- and no other documents are necessary.

Taking a closer look to the above definition of E-Administration, we can see that the authors do not limit the recipients of E-Administration services to citizens. Thus, E-Administration implicitly includes enterprise services. Here also exist potentials to simplify bureaucratic processes. To sum up, it can be said that in a country with an appropriate implementation of E-Administration, the public sector acts as a customer-oriented service provider, which likes to serve citizens and enterprises by using information and communication technologies. One benefit for governments utilizing E-Administration is a possibly increased civil, and respectively enterprise, satisfaction. Another advantage could be cost savings resulting from enhancing the degree of automation.

The other dimension of E-Government is called E-Democracy, which encompasses every kind of citizen involvement in public processes and political decision-making using ICT. In other words E-Democracy wants to use ICT to assist in exercising democratic procedures and hereby strengthening democracies (Friedrichs et al., 2002, p.107). To split this further, we can think of sophisticated electronic voting machines or technical solutions that facilitate the process of voting, which can be summarized by the term E-Voting. Besides E-Voting, Macintosh (2004) uses the term E-Participation to describe those parts of E-Democracy that are not immediately dealing with the process of voting, for instance the use of ICT to find out the opinion of the people

regarding political decisions or explaining such decisions to citizens.

As E-Voting is mainly a technical challenge (Friedrichs et al., 2002, p.33; Macintosh, 2004; Macintosh, 2008) we only outline some challenges in this area and some strategies to handle them. For further details on this topic, please consult, e.g. Herrnson et al., (2008). As mentioned earlier E-Voting deals with all kinds of E-Democracy activities that immediately address the process of electronic voting - whether through stationary machines, over the Internet or using your mobile phone.

Today there already exist different kinds of voting machines and additional electronic helpers for the process of voting. For instance there are voting machines that use buttons to choose who to vote, others make use of touchscreens and still others use optical scanners to evaluate the completed ballot paper. The Massachusetts Institute of Technology (MIT) introduced another system, which uses a microphone and headphones to cast a vote (Herrnson et al., 2008).

So-called Vote Verification Election-Audit Systems (VVEAS) can also be assigned to E-Voting as they take up concerns like "How do I know, that the system properly recorded my choice." These machines use artificial voices or paper prints to certify that the system recorded the choice as intended (Herrnson et al., 2008)

There are some countries that already started using voting machines in elections - mostly not all over the country but as test runs at selected polling locations. According to Hernnson et al. (2008) those test runs showed, that there are still some usability issues left for future work before the systems should be used extensively.

Fundamentals of E-Participation

The second part of E-Democracy is, as mentioned earlier, E-Participation. Macintosh (2008) defines this term as "the use of ICTs to support information provision, top-down engagement which is concerned with the support for government-led initiatives, and ground-up empowerment which is mainly concerned with the support to enable citizen, civil society organizations and other democratically constituted groups to engage with their elected representatives and officials."

In other words E-Participation wants to improve the public's interest in politics, simplify and promote political commitment and collaboration, and make the whole process more transparent. One important reason, why this is necessary, is that the legitimacy of legislation can only be ensured if the opinions of a majority of the population is taken into consideration (von Engers, van Haadten, & Snellen, 2011; Macintosh, 2008). If too few people play a part in this process, legitimacy is in danger. Intuitive indicators of participation might be, for instance voter turnouts or the number of members of political parties.

Fundamental for the implementation of E-Participation is what Macintosh (2008) calls information provision - the availability and accessibility of information. This, for example, includes plain numbers describing the facts concerning a special topic as well as other people's opinions and ideas regarding this issue, and expert views and estimates about it. As shown in Figure 1, according to Macintosh (2008), information provision is vital to the other parts of E-Participation, namely top-down engagement and ground-up empowerment. The provision of open government data (see section transparency through public data) is one application possibility of governmental information provision.

Top-down engagement, the second part of E-Participation, is "concerned with the support for government-led initiatives." This can encompass a government's call for contributing in a specific political discussion, promoting recent decisions as well as reasons that led to this decision, and in general making people care for political affairs.

The third term used by the definition is ground-up empowerment, which should simplify and improve interacting with elected representatives

Figure 1. The different objectives of E-Participation according to Macintosh (2008)
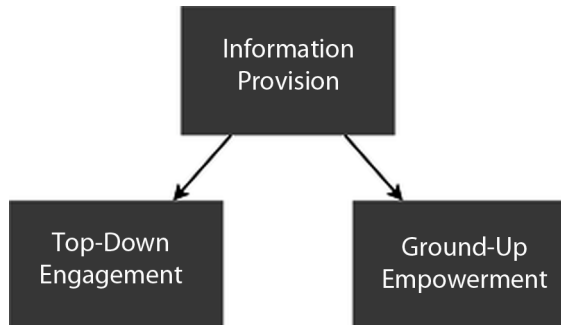
to express opinions and suggestions, but also dissatisfaction with certain decisions or processes (Whyte, 2008). Ground-up empowerment not merely should be a possibility to respond to topics that are part of the current political agenda, but rather should offer the chance to add an issue to the current agenda in order to discuss subjects that seem important to individuals and come up with solutions (Macintosh, Davenport, Malina, & Whyte, 2002; Macintosh, 2008; Phang & Kankanhalli, 2008). With E-Participation in some cases it might be possible to use the wisdom of the crowd to come up with new, and sometimes even better solutions for different challenges (von Engers et al., 2011).

Involved Stakeholders

Implementing E-Government and E-Participation has an impact to several stakeholders. To explore the effects, both positive and negative ones, it makes sense to put oneself in the position of each of those participants. Although one might argue that this is a very high-level classification not really considering all differences inside those groups, we will outline the positions of the three stakeholders that we consider the most important, namely 1) the public sector, 2) the citizens, and 3) enterprises. If necessary we will slightly refine this high-level classification to consider different aspects of some of those stakeholders.

The public sector is one of the main beneficiaries of E-Government when thinking about all the governmental agencies that gather, store, process and draw inferences from data. Von Lucke & Geiger (2010) state that it is necessary for a country's administration to stay (or become) up-to-date regarding technology in a world that values transparency more and more. Staying up-to-date in this case includes the application of modern ICT to improve the efficiency in handling data (Hovy, 2008). In fact, automating information processing could lead to a considerable acceleration for present manual processes. Of course, in a huge and sophisticated structure like a state it is challenging to apply such changes, as von Lucke & Geiger (2010) also mention. But there are also a lot of advantages in doing this. As previously mentioned, E-Administration deals with that.

Hovy (2008) suggests to divide the tasks of the public sector into three parts. In the previous passage we considered the public sector as an information processor. E-Participation affects the other two parts in a more intense way: the public sector as a function and the public sector as an organization. According to Hovy (2008), taking the function perspective, governments should ask themselves what would improve the quality

Figure 2. The three stakeholders of e-government. The circle sizes refer to each stakeholder's importance regarding developments in e-participation.
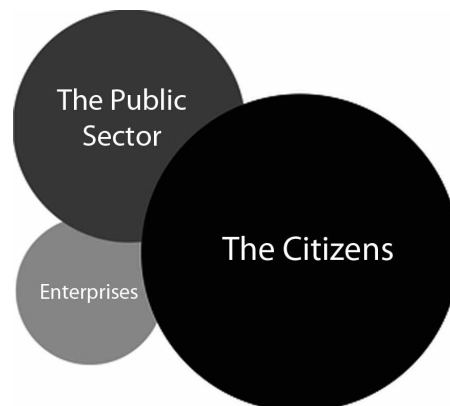
and velocity of their decision making to act in the best interest of the citizens. Several research projects explore how to make the public opinion more accessible to policymakers - for instance the FUPOL project (2013) and the work of Kalampokis, Hausenblas, & Tarabanis (2011) are dealing with this issue.

The third perspective of the public sector, as an organization, highlights the effect of changes implemented. Here, we want to evaluate how well, e.g. the integration of public opinions, works (Hovy, 2008). Is there an increase in public interest in politics after applying new processes? Are citizens happier with political decisions, both short-term and long-term? Do people think they can contribute in political decision making more than in the past? As mentioned earlier, improvements in decision making can lead to a higher legitimacy of legislation, which should be one of the public sector's goal (von Lucke & Geiger, 2010).

The second group of stakeholders we want to consider are the citizens of a community. E-Government promises lots of benefits to citizens. Implementations of E-Administration are supposed to facilitate the interaction between citizens and public authorities. Government-to-Citizen (G2C) is a term to describe these points of intersection, where citizens are treated as costumers and an important goal is to maximize customer satisfaction. So E-Administration often can be seen as an immediate benefit for citizens - although Heeks (2005) determined that some projects drift away from customer satisfaction as the main goal (p.136).

Likewise E-Participation can be identified as such an advantage mainly designed for citizens. Figure 3 sketches which stakeholder benefits most from E-Participation projects. As mentioned earlier, E-Participation tries to improve the public's interest in politics, as well as to simplify and promote political commitment and collaboration. It is important to note here, that any interest in politics and any contribution should happen on

a voluntary basis and should explicitly not be forced by any other stakeholder. As different people want to participate to a different extent, and therefore assess the value of various possibilities to participate by one means or another, it makes sense to distinguish different levels of participation. We will use the three categories that Macintosh (2004) came up with (and that are very similar to the ones, Jankowski & van Selm (2000) describe): 1) e-Enabling, 2) e-Engaging, and 3) e-Empowering (see Figure 3).

As Macintosh (2004) states, e-Enabling addresses the "two aspects of accessibility and understandability of information." In other words, in a state where E-Government is implemented to a high degree, for someone looking for certain information, it is easy to access different kinds of data and using opportunities of help to understand the exiting information. The more data is accessible and understandable, the more transparency is guaranteed. The public data that is available can be economical data, results from social surveys or information from a variety of other areas.

If someone is not only interested in certain information, but also wants to form an opinion on a particular issue, it is useful to have access not only to the information itself, but also to other's opinions and arguments, as well as to have the chance to discuss ideas with others. Macintosh

Figure 3. The levels of citizen participation according to Macinthos (2004)
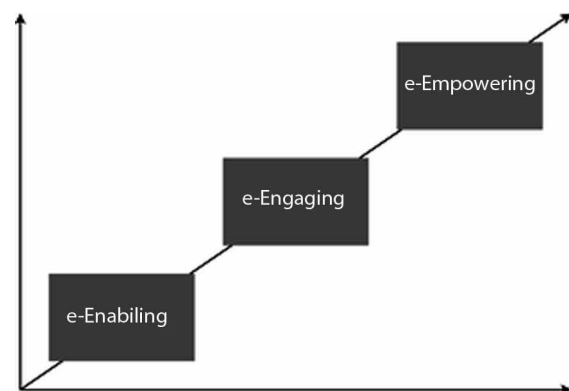
(2004) summarizes this level of participation as e-Engaging. For example Macintosh, Malina, & Farrell (2002) introduce an Internet platform where citizens are invited to create petitions, to view and sign them, as well as to add background information. There are also forums to discuss open questions.

As the third and most intense level of participation, we consider e-Empowering. E-Empowering "is concerned with supporting active participation and facilitating bottom-up ideas to influence the political agenda" (Macintosh, 2004), and therefore bringing citizens' ideas to the attention of representatives and policymakers. This immediately improves the degree of citizens' influence to the political agenda and political decision making. E-Participation includes these ideas of empowerment among other things to achieve an early involvement of the community in the policy modeling process, and therefore a better overall acceptance of decisions taken.

As the accessibility to understandable information, the chance to discuss political issues and the chance to bring ideas to the attention of policymakers is vital for E-Participation, it is equally important to guarantee these possibilities to all citizens. In the section challenges and limitation we will describe this and other challenges in more detail.

Enterprises are the members of the third group of stakeholders that also need to be considered when thinking about the impacts of E-Government. In E-Administration there are the most points of intersection between businesses and public authorities. For example, in 2013 Germany started to gather income tax information via software, which is supposed to accelerate and facilitate the process for both enterprises and government agencies (ELSTER, 2013). Sometimes the term Government-to-Business (G2B) is used to describe projects like this.

While E-Administration, amongst others, aims to improve the communication between businesses and the government, E-Democracy does not con-

sider enterprises fully as a stakeholder. Most ideas here are supposed to facilitate things for citizens or to strengthen their power. However, when things are changing, there is a potential growth market for enterprises involved. Developing and producing voting machines is a task in E-Voting, where enterprises with appropriate expertise can make money. Likewise with the development and support for, e.g. online platforms, that government agencies want to utilize, and lots of consulting services, where specialized businesses can play a role. As the release of public data is an important first step for E-Participation, it is also possible to start a business using these data in a commercial way - as the commercial use of public data is explicitly claimed by the open data principles (von Lucke & Geiger, 2010).

What might be a disadvantage for large, influential companies that currently engage in lobbying activities is a possible decrease in their influence. Implementing E-Participation could potentially lead to a higher regard of the public opinion and therefore a possible decrease in a company's power in politics.

E-GOVERNMENT INITIATIVES AND IMPLEMENTATIONS

In the previous chapter we outlined E-Government. In this chapter the praxis is in focus, and what solutions support the idea of including citizens in E-Government.

Transparency through Public Data

Providing governmental transparency is one of the main issues to increase trust in governments. Using ICT to release public data and therefore increase transparency hence is one aspect of E-Government. As mentioned earlier, having access to such data is the foundation to form an opinion regarding a political topic. Statistics, for example, can give insights into the status quo and historical

developments. Likewise forecasts can give some indication of what may be expected and therefore be a good basis for one's opinion making. Of course it is an important issue to collect data properly and comprehensively. However, at this point we focus on the appropriate publication of available data, rather than giving extensive suggestions about what kind of data needs to exist.

When thinking about how to publish data, the idea of open data provides some noteworthy recommendations. Von Lucke & Geiger (2010) define open data as the complete amount of data that is accessible free of charge for the public benefit without any limitations regarding its usage, its retransmission, and its re-utilization. As the authors continue, no limitations explicitly include the permission to use open data for commercial or military purposes. Licenses usually define the conditions under some data can be used. According to the Open Knowledge Foundation published data can only be considered as open data, if the data's license only dictates the user to mention the original author when sharing the processed data, and requires the user to distribute any work that is including the data under the same open data license. The Open Knowledge Foundation provides licenses for open data on their website www.opendatacommons.org.

Besides these definitions, open data should be accessible in an easy way, for example over the Internet via download and without a login needed. Also the data should be available in an open file format that is free-to-use (von Lucke & Geiger, 2010; Open Knowledge Foundation, 2009). Using the CSV file format should be chosen over using a Microsoft Excel file format, using a HTML or TXT file should be preferred over using a Microsoft Word file format. Another issue is the machine readability of data. For an as straightforward as possible data processing, information should not (only) be provided as graphics, pictures or PDF files. Providing machine readable file formats, at best even access via an application programming interface (API), enables programmers and busi-

nesses to process the data fully automatic (von Lucke & Geiger, 2010). For instance, searching for files or file contents, comparing data and executing calculations on the data available are possible benefits of machine readable file formats.

The ideas of open data are general ones. Applying them to the public sector leads us to open government data. Von Lucke and Geiger (2010) are using this term to summarize the specific challenges and key ideas for the public sector when thinking about, what data should be published, and how this should happen. The authors draw on the considerations from the Open Data Network (2013), an organization that aims to promote, among others, transparency and open data. The authors state that all raw data available to any public authority should be published as open data, with the addition that personal data security laws must still be obeyed. Furthermore they demand to publish related metadata like what calculations have been made to get these results, and a documentation of the preceding data collection.

Another issue in dealing with open government data is the temporal proximity of publishing the data. Unfortunately the authors are answering this question quite vaguely: data should be published within an appropriate timeframe (von Lucke & Geiger, 2010). It is very likely that there is a difference in importance of different kinds of data and various data sets. Taken as a whole data should be published as soon as possible, valuing the importance of current data for citizens willing to participate in politics. Once a data set has been made public, it should keep being available permanently. In the next section, we will introduce some currently available online data platforms, where open government data is published.

Data of public interest include but are not limited to geological data like the locations of bus stops and fire hydrants, multimedia data (enriched with metadata to ensure machine readability) like records of congress sessions, and textual data like laws and transcripts of political speeches. Statistical data are available comprehensively to public

authorities, and often are the basis for political decisions. As mentioned above, these raw data should also be published, as they can give an insight for interested citizens as well.

Public Initiatives and Directions

Now as we have described the theory behind E-Government and E-Participation, we want to take a closer look at what governments and other organizations have already implemented and where there still is some potential to transform current approaches. The preceding section covered ways to make public data available to citizens. In practice there are already some platforms in use, where citizens can download raw open government data. Especially noteworthy are the platforms www.data.gov.uk and www.data.gov were all kinds of governmental agencies of respectively the United Kingdom and the United States publish historical and current data sets. To assess the amount of data available to government agencies, it makes sense to take a look at the number of data sets available on data.gov.uk: more than one year after the site's public launch in January 2010 over 8700 data sets were available. One year later the number of data sets increased by two thirds to about 14500 (whereby at this time about 4000 data sets were marked as unpublished). The number of available datasets on data.gov in November 2013 was around 91000.

Published data sets on either platform include, for example, health surveys, emergency data, pupil teacher ratios, organograms of different agencies, expenses of departments, water quality, and census data. To help users drawing inference from available data, both platforms provide possibilities to find related or linked data sets (Cyganiak, Field, Gregory, Halb, & Tennison, 2010; Lebo & Williams, 2010; Kalampokis, et al., 2011).

Both the government of the United Kingdom and the government of the United States want to transform their countries to provide transparency and implement E-Government in more detail.

Sir Tim Berners-Lee and Professor Nigel Shadbolt are part of the project data.gov.uk trying to steadily improve the platform (Cyganiak et al., 2010; Sheridan & Tennison, 2010; von Lucke & Geiger, 2010; Shadbolt et al., 2012). A sign of the declared intention to promote E-Participation in the US, for instance, is the E-Government Act of 2002 (Pub.L. 107-347, 116 Stat. 2899, 44 U.S.C. § 101, H.R. 2458/S. 803[2]), and Obama (2012) declared in a speech: "Government should be transparent," "Government should be participatory," and "Government should be collaborative."

Although the governments of the United Kingdom and the United States can be considered as pioneers and most advanced providers of open public data (Ahmed, 2006; Kalampokis, et al., 2011), they are not the only organizations pushing E-Participation. Canada (Brandt & Gregg, 2008), New Zealand (Ahmed, 2006), Australia (Hsu, Hu, & Chen, 2008), Germany (GovData, 2013), Singapore (Ahmed, 2006), China (Xing, Yang, He, Zhang, & Chen, 2008), and many other countries[3] have similar data platforms. The European Union is another E-Participation booster. Via the platform Eurostat, EU citizens have access to a wide variety of statistical data regarding all EU countries which makes it easy to compare the figures directly. Eurostat also offers a large amount of metadata to make available data easily interpretable (von Landesberger, Knuth, Schreck, & Kohlhammer, 2008; Shadbolt et al., 2012).

But not only databases are already implemented and ready for use. There are also a large number of other E-Participation systems operating. Panopoulou, Tambouris, & Tarabanis (2009) analyzed the situation in Europe, examining 255 E-Participation initiatives from 18 different European countries. 144 of these initiatives did not mainly focus on information provision which shows the variety of different approaches (see Figure 4). Currently running projects, for instance, are the online petition platform Askbristol (Phang & Kankanhalli, 2008) and a similar project for Scottish citizens (Macintosh et al., 2002), the urban development

Figure 4. Participation areas of the e-participation initiatives, analyzed by Panopoulou et al. (2009)
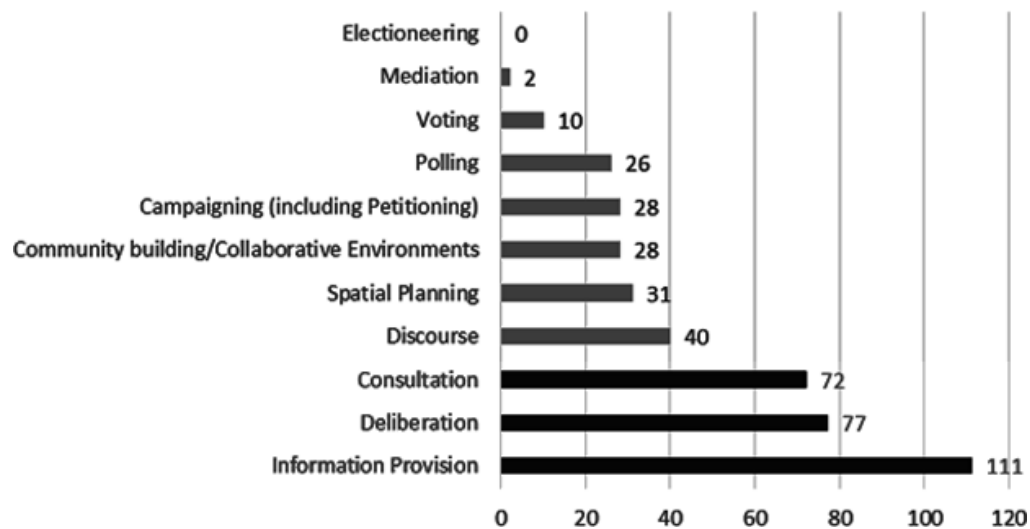
simulation system UrbanSim (2013) used in Tel Aviv (Ahmed, 2006) and Melbourne (Borning, Waddell, & Förster, 2008), a South African discussion forum for educational issues, and a discussion possibility for politics provided by the Brazilian government (Ahmed, 2006).

This list is only a small sample of projects - and additional projects are expected to be released as E-Government research is being promoted and funded by various governments and organizations: the United Kingdom is investing heavily in technology for data administration and data publishing (Cyganiak et al., 2010). There are various E-Administration research projects funded by China (Xing et al., 2008), and most of the 255 E-Participation projects mentioned by Panopoulou et al. (2009) were funded by the European Union, which heavily promotes further initiatives. The EU funded research project Future Policy Modeling (FUPOL project, 2013) for example aims at automatically collecting, analyzing and interpreting opinions expressed over the Internet and therefore is implementing E-Participation to a high degree. To promote and appreciate successful projects as well as to provide an incentive for others, in 2001 the EU started the eEurope Awards

(Gieber, Leitner, Orthofer, & Traunmüller, 2008; eEurope Awards, 2005). For the 2005 awards 234 projects applied for four categories. To motivate E-Government implementations the United Nations publish an E-Government readiness ranking[4] on a regular basis. International Organizations like the UN or the World Bank emphasize that more collaborations in E-Government research and implementation could accelerate and improve achievements for the benefit of all citizens (Brandt & Gregg, 2008).

Challenges and Limitations

Implementing E-Government and E-Participation bears a lot of challenges. In this section we will outline three of the main questions arising with the transformations aiming to facilitate G2C and G2B interaction, to provide governmental transparency, and to empower citizens. We will focus on the following three issues: 1) despite the enormous amount of data, that should be published, how can data privacy still be ensured? 2) How can we guarantee, that no one gets excluded from the new possibilities? 3) Who fund the initiatives and are they economically reasonable? These are not

the only challenges, but they exemplify the wide range of issues that need to be considered along with all the E-Government benefits.

Public authorities have a heavy responsibility holding a huge amount of sensitive personal data. As summarizing these data to provide insightful statistics is claimed by the definition of E-Participation, there is a risk of (inadvertently) publishing personal data without prior agreement. Regan (2008) mentions "if individuals do not believe that their privacy will be protected, the will not use available E-Government features." So citizens' trust in the protection of private data and careful data handling is vital to the success of E-Government. Also Heeks (2005, p.254) emphasizes that public authorities need to establish and maintain a relationship of trust with citizens. Von Lucke & Geiger (2010) expand this statement and say that likewise the third stakeholder - enterprises - needs to be considered in this issue. They often hold valuable corporate trade secrets that must not made public.

Fully automatic methods to anonymize data sets and to blur or eliminate secret data already exist for a long time (for instance Rubin (1993)), so a lack in technical solutions is not the case. The point is that public officials' awareness of the high degree of sensitivity of the data handled must be guaranteed. Trainings can help officials to distinguish what data needs to be anonymized and what data sets are ready to be released safely to the public. Being trained to be conscious of the responsibility and citizens' trust is essential to avoid inadvertent mistakes in public data provision and hence is vital to E-Government's success.

The offer of new and more possibilities to citizens for information purposes about political issues is good for the user in general, but more important, it is a necessary aspect of a valuable E-Participation strategy in a country. Especially, if the new methods are substituting familiar procedures rather than being supplements to them, decision makers need to make sure that nobody gets excluded from using the new possibilities.

For instance, if someone wants to access statistics from an online governmental data base, she needs the technical infrastructure like a computer, and an appropriate Internet connection. These days it might seem unlikely not to have access to the Internet, but like Eurostat data of households with Internet access show, in Europe there are still a lot of people without access to this tool (see Figure 5). In fact these averaging numbers conceal the fact that inside countries and regions, Internet access is not uniformly distributed (Nixon, Koutrakou, & Rawal, 2010). Outside metropolitan areas or wealthy neighborhoods, for example, it is more likely that the technical infrastructure to be able to use E-Participation services is missing (Heeks, 2005, p.141). In literature the term digital divide is often used to characterize this phenomenon. Digital divide also encompasses differences in ICT knowledge, which probably discourages certain groups of citizens to use E-Participation possibilities (Nixon, et al., 2010).

Whatever reasons keep someone from using the newly available services, compared with citizens having access to them, there is a considerable disadvantage and inequality in participating in politics and make one's voice heard, unless there is an alternative non-ICT way to actively participate in democracy. Hence an important subtask of implementing E-Participation is either to guarantee equality in infrastructure access, ICT knowledge and service usability, or to provide alternative ways of participation. Whereby physical or mental disabilities making it harder to use E-Participation services need to be considered along with the financial and physical possibility to access these services and everyone's ease of handling them (Becker, 2008).

The last challenge we want to consider here, is the question regarding the profitability of E-Government. As mentioned earlier, governments and organizations like the European Union are the main funders of E-Government research and implementation. Therefore in the end primarily taxpayers - citizens and enterprises - are paying

Figure 5. Percentage of European households having access to the Internet at home as of 2011, according to Eurostat data (map taken from http://www.digitale-europakarte.de)
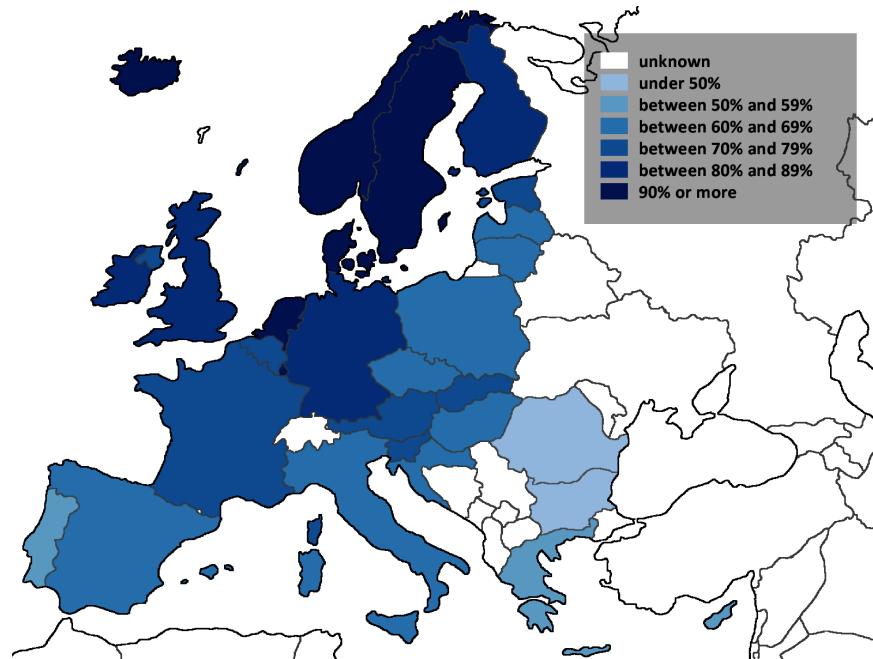

to transform the current way of political participation. But is this money invested rationally? Is E-Government research and implementation economic? To answer this question we need to examine both sides of the equation and figure out what are the one-time costs, what are the costs of operation, and how we can measure the utility of new services and processes (see also Figure 6).

Unfortunately, estimating the development expenses accurately often fails. Especially in large-scale IT projects it is hard to estimate costs and, in fact, expenses are likely to be underestimated or some costs simply are not taken into account in the first place (Dawes, 2008; Heeks, 2005). Hence, development expenses often are known not until the project is in a final state. The case is similar with the costs of operation. Measuring the utility of implemented E-Government services is a nontrivial task as well. What is the value of better political decisions? How much is it worth to improve the speed of decision making? How to assess the improved availability and accessibil-

ity of governmental services? One thing that is probably slightly easier is to estimate the benefit of generating new jobs, new private investments, and, associated with that, enhanced tax revenue. Those benefits, for example, can go along with the professional development of mobile apps that use some newly available open government data (von Lucke & Geiger, 2010). According to an article in a German broadsheet newspaper, the publication of open government data has a multi-billion Euro commercial value (Süddeutsche Zeitung, 17/11/2012).

A problem concerning the profitability of E-Government initiatives, that Heeks (2005) came across in his investigations, is that some implemented services are hardly used by citizens. He mentions an example were only 2% of the target citizens made use of an online E-Government service. Another service, he mentions, was ready to use for 2 years, but not a single citizen utilized the investment (Heeks, 2005, p.253). The author traces the failure of these services back to a lack in

Figure 6. Payback period of e-government projects according to Heeks (2005, p.209)
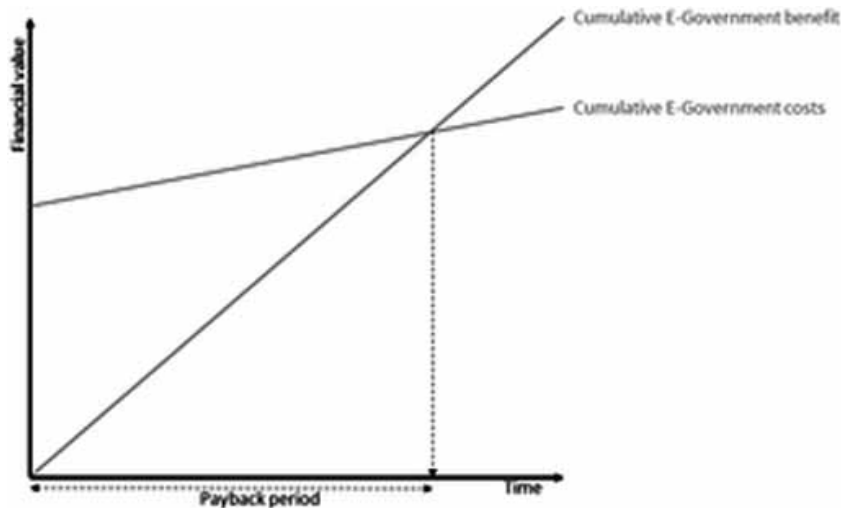
proper announcement and appropriate marketing. Thus, his advice for future projects is to inform citizens more about the advantages of newly available service, like shorter processing time, or new possibilities, traditional services did not even offer.

CONCLUSION

With this chapter we provided a basic overview about the general and technical aspects of E-Government. It aimed to wrap-up the major past activities concerning the E-Government domain in research and development, and identify the most relevant aspects that should be taken into account in new project and initiatives. Therefore we introduced the fundamental terms and definitions like E-Government, E-Administration, and E-Democracy first. To make it easier to understand the major aspects behind the broad ideas were described and we provided some real-life examples. We investigate efforts on defining the characteristics of e-Participation. Here we found out that it is important to have access to a wide variety of information to participate in politics, and that there are two general ideas of how to

participate. As E-Government affects different kinds of stakeholders, we introduced the positions of the public sector, the citizens and enterprises and illustrated the main advantages and concerns for each group of stakeholders. We also explained that different parts of E-Government are very specific to certain stakeholders, for example, E-Participation is more likely citizen-centric.

In the second part of this chapter we took a closer look at actual E-Government initiatives and implementations. As online data platforms play a major role in information provision, we introduced the theory behind open government data to improve transparency as well as some concrete suggestions on how to publish public data. With data. gov.uk and data.gov, we presented two platforms that already provide open data, held by government agencies. We also gave some examples of data that is publicly available at these platforms. Along with these open government data services, there is currently a huge amount of E-Administration and E-Participation services running. We listed some interesting projects to show the variety of different approaches pursued. In the field of E-Government there also exists a couple of researches promoted and funded by governments, as well as

transnational and international organizations. We also mentioned some current research projects and initiatives to encourage E-Government research.

Afterwards, we considered several challenges that arise when thinking of the implementation of E-Government services. We took a closer look at ways to guarantee private data security and possible problems with the equality of citizens in an E-Government world. We also investigated in this section, what the cost effectiveness of E-Government research and implementation is.

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KEY TERMS AND DEFINITIONS

E-Government: E-Government is the modernized form of Government, but under consideration of Information and Communication Technologies (ICT).

E-Participation: E-Participation is the modernized form of Participation, with the goal of engaging citizens in policy making. Through the use of ICT it is aimed to allow citizens to influence the political agenda by their options. In contrast to the traditional form, by the use if ICT it is easier to organize in groups and to realize e.g. petitions.

Information and Communication Technologies (ICT): Under Information and Communication Technology technologies for information provision, sharing, using and visualizations are summarized. A major benefit lays in the exchange of data for the use with other technologies and therefore the use in a number of different use cases.

Open Data: Open Data is a term that is commonly used for statistical data that are provided by governments and can be almost used for free. These Open Data (sometimes also mentioned as Open Government Data) consisting a number of indicator data about a country or a region. Such data are often provided and mentioned in relation to initiatives for a better transparency.

Policy: Under the policy a theoretical or practical instrument can be understood that aims to solve a specific problem. In the political domain, a policy can represent a new law.

Policy Modeling: The term policy modeling deals with the making of (political) policies, which can result in the creation of new laws. Policy modeling covers all necessary steps beginning at the identification of a problem, analysis, decision making, implementation, end evaluation of a policy.

ENDNOTES

[1]   The e-Petition platform allows Germany citizens to set a topic on the political discussion agenda and allows to discuss it with other citizens: https://epetitionen.bundestag.de (last accessed: 29/10/2013).

[2]   The full text of the government act can read at: http://www.gpo.gov/fdsys/pkg/PLAW-107publ347/pdf/PLAW-107publ347.pdf (last accessed: 29/10/2013).

[3]   A good overview about existing open data portals for different countries is available on: http://www.data.gov/opendatasites (last accessed: 29/10/2013).

[4]   Documents about the rankings are available at: http://unpan3.un.org/egovkb/global_reports/index.htm (last accessed: 29/10/2013).