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Daniel Veit
Jan Huntgeburth

Foundations of Digital Government

Leading and Managing
in the Digital Era

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Foundations of Digital Government

Leading and Managing in the Digital Era

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*To Anni, Jochen, Jonathan and Helena
To Lisa, Burga and Jürgen.*

Preface

Radical changes have shaken the public and private sectors alike, due to the impact of the digital age. This book serves as an introductory textbook on digital government management for students in business administration, information systems and public policy. It has been especially written for those students who intend to start a career in government or consulting and examines fundamental aspects of how governments can use information and communication technology to transform their relationship to society in such a way that government is perceived as more responsive, accessible, transparent, responsible, participatory, efficient and effective than before.

The content of this book is derived from a course that I have been teaching at the Business School of the University of Mannheim and the School of Business and Economics of the University of Augsburg, Germany, for the last 6 years. The idea of writing the book first occurred to me when I was searching for a textbook for my own digital government course. While there are many books on digital government, none really convinced me that it provided a broad and comprehensive picture of government reform in the digital era. This book intends to fill that gap.

There are many people who we would like to thank for encouraging, inspiring and supporting us in writing the book. I am especially grateful to Georg Schäfer from the Ministry of the Interior of the State Government of Baden-Wuerttemberg, with whom I have enjoyed a very productive and collaborative relationship for many years now. The discussions with him on the book's content have always been very helpful. I would like to thank Jens Förderer and Moritz Hofmann, who greatly assisted in preparing the manuscript. My special thanks also go to our publisher Springer and in particular Barbara Fess for supporting the preparation of the final print version. Finally, I would like to thank the Dieter Schwarz Foundation and its director Dr. Erhard Klotz for their financial support for this project. The majority of this work is based on courses I held as the Dieter Schwarz Endowed Chair of Business Administration, on Information Systems,

E-Business and E-Government at the Business School, University of Mannheim, Germany.

Also on behalf of Jan Huntgeburth, I wish all the best to the instructors, lecturers, professors and readers, but most of all the students who will read this book.

Augsburg
August 2013

Daniel Veit

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Abstract

The goal of this chapter is to provide a general idea of the characteristics, scope, goals, current status, and future prospects of digital government. Digital government is defined as the use of Information and Communication Technologies (ICT), in particular the internet, to transform the relationship between government and society in a positive manner. Two coexisting reform paradigms of digital government – the participatory and the managerial approach – are briefly introduced. Both paradigms aim to improve the relationship between government and society in such a way that government is perceived as more responsive, accessible, transparent, responsible, participatory, efficient, and effective than before. Moreover, digital government models aiming to explain, predict, and

prescribe how digital government develops are presented. Finally, an overview about the target audience, structure, and learning goals of this textbook is given.

Learning Objectives

The changing role of ICT

- How has the role of ICT in government changed?
- What is government?
- What are the characteristics of government organizations?
- Can we simply use e-business concepts?

The goal of digital government

- How can we transform the relationship between government and society?
- What is digital government?

Digital government reform paradigms

- What does the participatory approach offer?
- What does the managerial approach offer?

Digital government in practice

- How is digital government evolving?
- How is digital government development measured?

Concept of the book

- Who should read this book?
- What does each chapter contain?
- What are the key learning objectives of this book?

1.1 The Changing Role of ICT

1.1.1 How Has the Role of ICT in Government Changed?

Within the last 40 years governments have become totally dependent on the use of Information and Communication Technology (ICT). The breakthrough began with what we call today a digital government application: to support the 1890 US census, Herman Hollerith proposed the use of punched cards and semiautomatic evaluation. Technological progress was relatively fast: IBM 1401 computers were used in commercial organizations for the first time in 1958. Public administrations began using computers to obtain better registers (citizen register, car register). In the 1970s the police began to gradually substitute their paper-based search books with computer terminals. In parallel the tax authorities planned using ICT. To speak in the computer science terminology of that period, batch processing of police, tax, and local government data was enhanced initially with online search and some years later with online update capabilities.

In the early 1970s politicians recognized ICT as a core function for public administrations. Public data centers for data processing and software development were founded. At the same time the political and legal discussion of privacy and

data security began. The tremendous potential strategic importance of ICT for better governance and efficient public administration was seen in the early 1980s. Obviously ICT had the potential to turn political objectives into reality. The first Chief Information Officers (CIOs) were assigned. The European Commission started the European Nervous Systems initiative and founded a high-level group to standardize ICT for pan-European public services within the Trans-European Networks program.

With the evolution of the internet and personal desktop computers in the 1990s, a reliable and cost-effective infrastructure for user-friendly IT applications became available. The core functions of governments like strategic planning, statistics, financial and legal registers were based on ICT and became progressively more efficient. Additionally, the internet provided new opportunities for policy-makers and governments to offer interactive services to citizens and enterprises, which now in the information society have gradually developed into a new concept of participation called open government.

Today, ICT has become with the acronym of digital government a generally used and needed service infrastructure for practically all operational and political processes of a modern democracy and its public administration, for the use of media in politics, and to support major change processes in all areas of the information society. Thus, digital government supports and integrates the three powers of democracy with ICT: the process of law making from the first requests to the final draft of the government which is sent to parliament for approval, the operational actions to put the laws into practice, and the work of the courts and their statistical evaluation which may lead to amendments to the initial law. A great deal of data and information including parliamentary documentation and the various reports produced by the government and the numerous interest groups in society are placed into more or less open knowledge bases to be used for further political or administrative actions. Overall, a professional and transparent use of ICT in all aspects of governance is vital for political success, better regulations, and globally acknowledged good governance.

1.1.2 What Is Government?

There exist different views on what government comprises. In the narrower sense, the term government is used to refer to the prime minister and the cabinet. However, we take a broader perspective on government throughout this book. Herein, government refers to all legal, political, and administrative organizations, and their people, that control a state. There are three branches of government, the legislators, the administrators, and the arbitrators. The legislators are responsible for writing and passing laws and regulations. In a democracy, legislative power arises either directly through policy referenda or indirectly through elected representatives that debate and vote in parliament. These elected representatives constitute the legislative branch of government which writes and passes laws and regulations. The public administration which constitutes the executive branch of government has the authority and responsibility for the daily administration of the

state. Thereby, the actions of the public administration are bounded by the laws and regulations passed by the legislative branch. Finally, under the doctrine of separation of powers, the judiciary generally does not make (which is the responsibility of the legislature) or enforce (which is the responsibility of the executive) law, but rather interprets law and applies it to the facts of each case. For example, citizens who feel exposed to arbitrary and abusive use of government power can generally appeal administrative or legislative decisions in court. Within this book, we focus solely on how digital government can support and improve the legislative and executive branch in a representative democracy. To understand the foundation of digital government the different roles of government organizations have to be taken into consideration by the reader. While legislators search for political solutions to urgent political issues resulting in an ever-increasing number of laws and other regulations, public administrations enforce laws by offering or even coercing citizens to use their public services.

1.1.3 What Are the Characteristics of Government Organizations?

Looking across nations and cultures in the European Union we find many ways to organize the work of the three powers in a representative democracy. Some work with full transparency, for example on the basis of a freedom of information act, others work more formally with the publication of well-elaborated papers in the various stages of their legal, governmental, or administrative activities. Some govern with an elected governor and a cabinet of directors chosen by the governor him/herself; some have governments with highly autonomous cabinet members appointed by parliament as a full cabinet list or as individual cabinet members. Under the level of government we find administrations that are fully dependent on their responsible minister. Some public administrations work autonomously like commercial organizations. Some states have administrations with directors reporting to parliament. Some public administrations are founded solely to put a political program into action and as soon as this is done and the budget spent, the administration is dissolved. Other authorities work on everlasting tasks and yearly budgets with minor changes involving for example police, the military, and possibly health care.

1.1.4 Can We Simply Use E-Business Concepts?

Digital government has often been portrayed as the public sector counterpart of e-business which involves the buying and selling of goods and services, as well as serving customers, collaborating with business partners, and conducting electronic transactions within a private organization (Turban et al. 2012). However, e-business concepts cannot generally be transferred to the public sector due to differences between government and private sector organizations. Essentially, differences can be identified with respect to environmental drivers and constraints, organizational mandate and scope, as well as internal processes, structures, and incentives (Raine et al. 1976).

The impossibility of involvement with the economic market (e.g., courts, police, military, health service, social aid) is one of the key particularities of public organizations as opposed to their private counterparts. In the private sector, the economic market enforces relatively automatic penalties and rewards, and thus, provides incentives to improve efficiency and performance for restricted homogeneous and commercial objectives. Governments search for solutions to heterogeneous and often contradictory requests, from a steadily growing multitude of more or less powerful groups within society, for political decisions. Especially when society changes, new challenges arise or, for example, economic progress simply slows down, social (or more generally: political) conflicts can often not be resolved through a win-win situation. Political conflict management involves trade-offs and often results in political compromise. By virtue of their organizational mandate and scope, the relationship between the government, and citizens and enterprises can be coercive although coercive actions can rarely be exercised against the political will of important parts of society or the majority of social groups.

A government cannot choose its “customers” and has to treat all people that are subject to its power equally. As a consequence of possible heterogeneous political deals, citizens feel that government organizations typically lack an orientation towards the customer and efficiency in relation to the clearly understandable homogeneous objectives of private firms. However, governments intend and usually achieve efficient transformations of their typically complex political programs.

The coercive nature of government actions might also be the reason for formal control mechanisms. The purposes, methods, and spheres of operation of government organizations are almost entirely determined by laws and regulations. Hence, process reengineering is not only an organizational challenge but may also require coordination with the legislative branch to be successful. A multitude of autonomous government organizations with sometimes conflicting objectives (like implementing sustainable protection of the environment vs. developing faster and better transportation, e.g., by building new highways), further complicate implementation. As a result, change processes may be more protracted in government organizations than in private organizations where fewer actors with comparatively simple business models are involved in decision-making. When e-business concepts are transferred to the public sector, caution needs to be exercised with respect to these differences.

1.1.5 Outline of This Chapter

The remainder of this chapter is structured as follows. First, we elaborate why digital government may transform the relationship between government and society in positive ways. In particular we discuss how ICT can be used to improve people’s trust in government. Second, we introduce the managerial approach and the participatory approach as two often distinct domains of digital government reform. Finally, we give an overview over the target audience, structure, and learning goals of this textbook.

1.2 The Goal of Digital Government

1.2.1 How Can We Transform the Relationship Between Government and Society?

There is widespread concern that people have lost faith in the performance of politics and political systems as a whole. Given the great opportunities presented by ICT and in particular the internet, it is hoped digital government will restore the relationship and improve people's trust and confidence in government (Norris 2001). Society's trust and confidence in government is important for many reasons. Trust is crucial for the legitimacy and stability of the political system (Tolbert and Mossberger 2006). If people's trust in the institutions declines, their willingness to accept government authority will also decline. Declining trust can be also linked to declining political participation. For example, increasing distrust of people in government might be mirrored by a dramatic decline in voter turnout over the last 40 years in the European Union. Trust in government also encourages people to comply with laws and regulations. Overall, if we believe in the integrity of political, administrative, and legal processes, we are much more willing to accept the outcome. Thus, increasing a society's trust in government should be a central concern of leaders and managers in government (Tolbert and Mossberger 2006).

Research on trust in government suggests that two mechanisms can be used to create and manage trust in government (Thomas 1998). On the one hand, process-based trust is created and managed through repeated exchanges or interactions with government. For example, positive user experiences with a government service can symbolize that a government is accessible and responsive. In general, any type of interaction with government will influence whether people trust in government, that is whether people feel that government is benevolent, competent, honest, and predictable (Zucker 1986). On the other hand, institutional-based trust is a general judgment (e.g., image or reputation) of government institutions which is not necessarily based on direct interactions. Government organizations can signal conformance with social expectations, thereby producing institutional-based trust. In order to transform the relationship between government and society, both institutional- and process-based trust can help to increase society's overall trust in government.

1.2.2 What Is Digital Government?

The term digital government denominates the use of ICT, in particular the internet, to transform the relationship between government and society in a positive manner. We believe that digital government can be used to increase both institutional- and process-based trust and thus, increase the overall trust in the benevolence, competence, honesty, and predictability of government.

Digital government can be used to increase the responsiveness and accessibility of government. Web sites or e-mail enable new convenient ways to interact with government with the result that government services are accessible around the clock and 7 days a week. By improving public service delivery, government can change external efficacy that is people's judgment that government cares about their concerns. Thus, responsiveness and accessibility increase process-based trust in government (Tolbert and Mossberger 2006).

Digital government can also be used to improve people's judgment of the accountability and fairness of government. Access to searchable databases containing policies, laws, minutes, plans, and contact information makes increased accountability of government to the public possible. Moreover, by publishing privacy and security statements as well as policies for handling personal information, governments can be perceived as fair and ethical. The implementation of digital government can improve transparency and responsibility perceptions of people and thus, increase people's institutional-based trust in government.

Other aspects of digital government can increase both process-based and institutional-based trust. Through digital government, service delivery can be more efficient and effective. On the one hand, people using public online services will feel that government is effective by providing all relevant information online. On the other hand, people will believe that government is adopting state-of-the-art e-business concepts which may transform the image of government in a positive manner. Thus, by improving the efficiency and effectiveness of public service delivery, government can increase people's process-based and institutional-based trust in government. In addition to improved efficiency and effectiveness, digital government provides opportunities for citizens to give input to political decision-making processes. Chats, forums, or interactive blogs allow people to become engaged. While those people who take advantage of these new opportunities will increase their process-based trust in government, others may simply see the opportunities for participation and thus, experience an increase in their institutional-based trust (Tolbert and Mossberger 2006). Overall, the goal of digital government (as depicted in Fig. 1.1) is to transform the relationship between government and society in such a manner that people view government as more responsive, accessible, transparent, responsible, participatory, efficient, and effective than before.

In academia and practice, there are two different but coexisting approaches to transforming government which will both be covered in this textbook. On the one hand, the legislative branch can use ICT to prepare and support political decision-making processes or promote more direct democracy. This participatory or e-democracy approach aims to revitalize trust in government through more transparency, responsibility, and participation in political decision-making. On the other hand, the entrepreneurial approach (also sometimes termed e-administration) is closely related to the digitization and modernization of public service delivery.

Fig. 1.1 Digital government: transforming the relationship between government and society



Through digital government, services are assumed to become more responsive, accessible, efficient, and effective. We will briefly outline in the next two sections, what the participatory approach and the entrepreneurial approach can offer. An in-depth discussion of the opportunities and challenges of both digital government reform paradigms follows in the remainder instead of rest of the book.

Summary

Digital government is defined as the use of ICT in government. The goal of digital government is to transform the relationship between government and society in a positive manner. By using ICT, government can modernize public service delivery and promote more citizen engagement in politics. As a consequence, digital government has the potential to change the relationship in such a way that people view government as more accessible, participatory, responsible, transparent, responsive, efficient, and effective than before. Two major coexisting reform paradigms, the participatory approach and the entrepreneurial approach have emerged in the digital era of government reform. These paradigms are introduced below.

1.3 Digital Government Reform Paradigms

1.3.1 What Does the Participatory Approach Offer?

Given society's full engagement with ICT (cf. chapter 3 digital divide), digital government has the potential to significantly improve political processes by creating new deliberative spaces for discussion (cf. chapter 9 e-participation),

increasing participation and cost-effectiveness in elections (cf. chapter 8 e-voting), and enabling more direct democratic elements in the political system (cf. chapter 2 impact of digital government).

The internet offers new opportunities for representative democracy by improving the dialogue between representatives and represented. The OECD (2001) categorizes these interactions into three categories, namely information, consultation, and active participation. The categories differ in the degree to which citizens can exert influence on decision-making. In the information stage, the government simply provides information on policy-making on its own initiative, for instance by providing access to public records or official gazettes. In the consultation stage, governments ask for and receive citizens' feedback on a policy issue defined by the government. Examples are comments on draft legislation and public opinion surveys. Engaging citizens in decision-and policy-making, for instance by allowing them to propose policy options, is referred to as active participation. The responsibility for policy formulation and the final decision rests with the government in a representative democracy.

In an election constituents have the opportunity to remove a representative who has been found to act in conflict with their wishes or who has simply failed to provide a publicly convincing explanation for it. Because of increased mobility, the share of votes casted remotely has significantly increased. Internet voting gives voters the ability to cast their vote cost-efficiently and conveniently from their home computer. However, internet voting faces various challenges such as the digital divide, vote selling, vote solicitation, or risks of security failures. Despite these challenges, there are many proponents who argue that internet voting might also be a way to introduce more direct democratic elements into the political system such as policy referenda. We will discuss the opportunities and challenges of e-democracy in Chaps. 2 (impact of digital government), 3 (digital divide), 8 (e-voting), and 9 (e-participation). We also discuss the prospects of e-democracy in the last chapter of this book (outlook).

1.3.2 What Does the Managerial Approach Offer?

Researchers interested in improving public service delivery using digital government, have described digital government as:

[...] the seamless integration of computer-supported government services. According to that vision, citizens and businesses alike access whatever government service they need through a single gateway (or portal), which integrates every aspect of that particular G2C or G2B transaction or interaction. By virtue of the integration, services would be more comprehensive, effective, efficient, and faster than before for both government and citizens/businesses. (cf. Table 1.1, Scholl and Klischewski 2007)

The rule of law protects the rights of citizens from arbitrary and abusive use of government power. Hence, a public administration is only allowed to perform actions based on current law. Thus, the digitization of public services requires a

Table 1.1 Interaction scenarios for digital government

	Citizens	Government	Businesses
Citizens	C2C	C2G	C2B
Government	G2C	G2G	G2B
Businesses	B2C	B2G	B2B

legal basis which is introduced in Chap. 4. With the introduction of the internet, public administration's initially focused on providing online services to citizens (G2C). A variety of different citizen portals emerged that provide services according to citizens' needs using the concept of life events, that is an integrated way of dealing with concerns (like education, health, statistics, tax, and security) related to a certain situation in the life of a citizen. When users access a citizen portal, they find the right information and services according to their concern. The concept of life events hides the complexity of administrative processes and ignores the functional organizational structure of the public administration. Examples of citizen's life events are birth, marriage, or death. Usually by the concept of "one window" an access portal is placed in front of these thematic portals. This provides the citizen with a single point of access to the complexity of administrative responsibilities and programs (cf. chapter on one-stop government). Although the complexity is hidden from citizens, democratic principles like division of responsibilities remain unaffected. All online services have the same legal quality as conventional services. For example, in case of a conflict, the judicial system like before empowers citizens to resist unlawful actions or arbitrary use of government power.

The provision of digital government services may involve collaboration between two or more public institutions. An example is the provision of building permissions where the building authority and the environment authority may have to collaborate. According to Klischewski (2004), "[...] integration denotes a state of readiness [...] to provide services [...] which are only possible through successful incorporation of informational or functional elements which had been isolated before." In conclusion, the prospects for implementing digital government are very limited unless a higher level of integration can be achieved among government organizations themselves as well as among governments and their private partners.

One of the most important public services is public procurement. Governments are the largest buyer in the European Union accounting for almost 20 % of European gross domestic product. Therefore, the implementation of technology which helps to improve the efficiency, equity, and effectiveness of public procurement is an important priority of European and national policy-makers. We discuss the opportunities and challenges of e-procurement in Chap. 7.

Apart from the efficiency-driven modernization of public services, citizens demand more transparency and accountability from public administrations with respect to the way they implement and enforce legislation. Open government is one of the most recent trends in digital government reforms, which promotes society's access to all kind of government data. Access to these data allows citizens to achieve more effective oversight and regulation of government activities. This

Table 1.2 Proposed stages of digital government evolution

	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
Layne and Lee (2001)		Catalogue	Transaction	Vertical integration	Horizontal integration	
Baum and Maio (2000)		Presence	Interaction	Transaction	Transformation	
Ronaghan (2002)	Emerging presence	Enhanced presence	Interactive	Transactional government	Seamless	
Hiller and Belanger (2001)		Information dissemination	Two-way communication	Integration	Transaction	Participation
Wescott (2001)		E-mail and internal network	Two-way communication	Exchange of value	Digital democracy	Joined-up government

digital government trend will be discussed in depth in Chap. 6. Finally, we discuss the prospects of public service delivery in the digital era in the last chapter of this book (outlook).

Summary

Two major reform paradigms of the digital government era have been introduced. The participatory approach focuses on changing political processes in a way that means they are perceived by citizens as being more participatory, responsible, and transparent. The entrepreneurial approach mainly aims at improving the accessibility, responsiveness, efficiency, and effectiveness of government services. Both approaches coexist and complement each other. Elements of both approaches are covered throughout this book.

1.4 Digital Government in Practice

1.4.1 How Is Digital Government Evolving?

Various models have been proposed to predict how digital government will or should evolve in practice. Some focus only on the entrepreneurial approach, that is how public service delivery could be digitized. But some also include e-democracy as a goal of digital government evolution. An overview of the most prominent digital government evolution models is given in Table 1.2. A more detailed description of these models is given in Coursey and Norris (2008).

The digital government models are predictive as they predict a linear, stepwise, and progressive evolution of digital government. Typically, governments start with providing a simple web presence (steps 1 and 2) and then transition to more interactive tools such as e-mail, forums, or social networking sites (step 3).

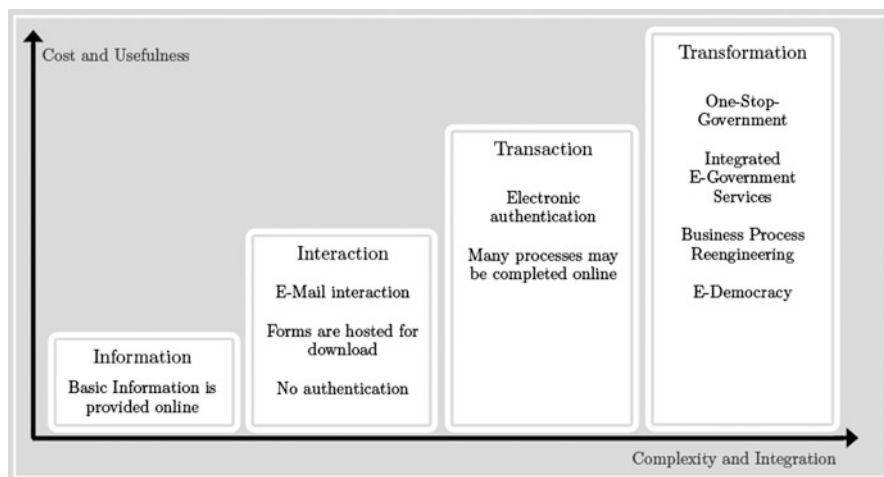


Fig. 1.2 Digital government maturity model of Baum and Maio (2000)

Subsequently, they build the capacity to offer also transactional services to citizens and businesses (step 4). The final step of digital government is described variously either as seamless delivery of government services (Ronaghan 2002), e-participation (Hiller and Belanger 2001), e-democracy (Wescott 2001), or government transformation (Baum and Maio 2000).

The digital government models are also normative as they suggest that interactive, transactional, and integrated digital government is always better and that more citizen participation in government is always desirable. Throughout this book, we will challenge this assumption for different elements of the digital government reform, that is we ask whether we actually need fully electronic and participatory processes in all areas of government.

An empirical examination of local government in the United States suggests that the descriptions in digital government models are an accurate explanation of evolution in its early stages (i.e., from a simple web presence to interaction to transaction). However, high-level functions such as seamless, transformative, or joined-up government are rarely implemented by governments. The reasons for this are also the subject of discussions in this book (Fig. 1.2).

Despite concerns about the accuracy of the models, they form the basis for assessing national and international digital government development. Various international institutions periodically compare the extent to which governments have implemented digital government in various fields such as ICT infrastructure development, e-participation, public service delivery, or e-procurement. Boxes 1.1 and 1.2 give an overview of the two most prominent benchmarking reports that assess the various aspects of digital government covered in this book.

1.4.2 How Is Digital Government Development Measured?

Box 1.1 United Nations Digital Government Survey 2012

In an annual manner, the United Nations Public Administration Network publishes the Digital Government Survey. It aims at measuring the e-government maturity of all 193 member states. Put more concretely, it is based on a survey that assesses the particular country's e-government strategy and the feature range of national online services. The data is consolidated in a comparative ranking composed of four indices. First, the telecommunication infrastructure index is based on estimated fixed and mobile internet subscribers. Second, the online services index assesses online content and features provided by the country's government and related ministries. Third, the ranking encloses the human capital index, composed of the indicators of adult literacy rate and the tertiary gross enrolment ratio. Supplementary to this, the e-participation index focuses on the degree to which the government uses the Internet to provide information, to interact and to engage citizens.

Considering the worldwide results, the Republic of Korea, the Netherlands, and the United Kingdom lead the e-government development index. In particular, regarding the online services index, the Republic of Korea, Singapore, and the United States are placed at the top of the ranking. For that index, the United Kingdom, the Netherlands, and Finland are the highest ranked European countries. For the telecommunications infrastructure index, Liechtenstein, Monaco, and Switzerland are placed at the top of the ranking. The e-participation index ranks the Netherlands, the Republic of Korea, and Kazakhstan as the highest with Germany located in 5th place.

Box 1.2 European Union Digital Government Benchmarking Report 2010

In 2000, the European Commission launched the eEurope initiative, aiming at accelerating e-government implementations in its member states. The plan set goals for e-inclusion, efficient and effective government services, and strengthening of democratic participation and decision-making. Consequently, the commission published the European e-government benchmark in cooperation with country representatives of the 32 participating countries in order to measure the achievement of objectives. Among these were the EU-27 as well as Croatia, Iceland, Norway, Switzerland, and Turkey. The benchmarking is constituted of different indices that rank the participating countries relatively according to the degree these countries realized the set targets. In particular, the online sophistication, full online availability and user experience rankings measure the degree to which services are designed

(continued)

Box 1.2 European Union Digital Government Benchmarking Report 2010 (continued)

around users, fulfill the citizen's needs, and add value. In the services sophistication ranking, Ireland, Malta, and Austria are top performers. Considering the online availability measurement, Italy, Malta, and Austria lead the ranking, followed by Sweden and Switzerland. In terms of user experience, in particular service transparency, multichannel provisioning, ease of use, and satisfaction monitoring, Malta, Sweden, and the United Kingdom are well rated. In the e-procurement benchmark, Ireland leads the ranking, followed by Estonia, Lithuania, Malta, and Slovenia. In total, the results prove progress in the adoption of e-government services across Europe. In particular, e-procurement adoption increased significantly, both in old and new member states of the European Union.

Summary

Digital government evolution models were developed a decade ago. They provide guidelines to government organizations on how to incrementally implement digital government. Research suggests that these models are an accurate description of digital government in the early stages. However, governments have not yet achieved the high-level functions as predicted and suggested in the models. The models form the basis for assessing digital government development around the world. Whether a top benchmark ranking is always desirable will be subject to discussion in this book. In the following, we introduce the concept, structure, and key learning goals of this digital government textbook.

1.5 Concept of the Book

1.5.1 Who Should Read This Book?

This book is designed for students pursuing a degree in business or information systems who have a basic knowledge of ICT, management, and politics. The book gives an introduction to fundamental aspects of digital government. For a more advanced reflection of the aspects covered in this book, we encourage readers to study the bibliography of each chapter. The textbook can be used by both teachers and students. Teachers can prepare their own digital government lectures and find inspiration in regard to the topics that their course should cover. Students can study the fundamental aspects of digital government and recap the content presented in the lecture.

1.5.2 What Does Each Chapter Contain?

Each chapter starts with an abstract that gives the reader an idea of the topics covered. Each section aims to address a particular question. The learning goal of each chapter is that students can answer these questions and develop their own view of the controversies surrounding the implementation of digital government. Each chapter and section contains a summary of the most important lesson learned. The references allow readers to advance their knowledge beyond the fundamentals presented in this book. The textbook provides access to a slide deck which can be used by the lecturer only. It can be reached online via the product page of the textbook. Go to <http://www.springer.com/978-3-642-38510-0> and click on the link called “Slide Deck”.

1.5.3 What Are the Key Learning Objectives of This Book?

The goal of the first chapter is to provide the reader with a general idea of the characteristics, scope, current status, and future prospects of digital government. Digital government is defined as the use of ICT, in particular the internet, to transform the relationship between government and society in a positive manner. Two coexisting reform paradigms of digital government – the participatory and the managerial approach – were briefly introduced. Both paradigms aim to improve the relationship between government and society in such a way that government is perceived as being more responsive, accessible, transparent, responsible, participatory, efficient, and effective than before.

Chapter 2 discusses the impact of the internet on government. On the one hand, the internet provides new opportunities for the governance of political processes. In democracy theory, there is an enduring tension between direct and indirect democracy. Digital democracy has an impact on this tension and can enable more direct democratic elements and a better political culture. On the other hand, the widespread diffusion of personal computers and the internet have changed societal expectations in relation to public service delivery. The digitization of public service delivery is a paradigm shift from traditional bureaucracy towards a more “customer”-oriented delivery of public services.

The opportunities provided by digital government are highly dependent on the degree to which government is able to close the digital divide. The digital divide refers to inequalities regarding access to ICT between advantaged and disadvantaged groups. Within Chap. 3, a digital divide framework is introduced which helps to systemize the different aspects of the digital divide phenomenon. Moreover, different European initiatives are introduced which aim to close the ICT access gap in society. Moreover, implications for digital government are discussed.

Chapters 4, 5, 6, and 7 discuss how governments can change public service delivery through digital government. Chapter 4 provides an overview of the heterogeneous legal basis of digital public service delivery. With a focus on Europe and particularly Germany the “digital government legislation” initiatives are introduced and contrasted with the respective parallel developments in the United States of

America. Secure and private communication and storage of information has been identified as one of the key drivers of digital government initiatives. Hence, legal regulations relating to encryption, data protection, and privacy are the focus of this chapter. Finally, the domain of e-inclusion – the inclusion of citizens with disabilities – is addressed in the remainder of the chapter.

Chapter 5 presents the online one-stop government as a vision of public service delivery in the digital era. Different aspects of this model are discussed including the “life event” metaphor and interoperability. Moreover, the barriers and facilitators of online one-stop government are analyzed. While online one-stop government aims at a more efficient and citizen-oriented public service delivery, open government is another recent and coexisting paradigm shift in government reform. Open government is the governing doctrine which holds that citizens have the right to access the documents and proceedings of the government to allow for effective public oversight. Transparency and accessibility of government organizations are the main targets. The concept, challenges, and prospects of open government are presented in Chap. 6. Finally, e-procurement – defined as the use of the internet in public procurement – is examined in Chap. 7. E-procurement aims to accomplish a complex set of economic, political, and social goals within a complex legal framework. Legal aspects of public procurement are discussed as well as the trade-offs in the implementation of e-procurement in the public administration.

While Chaps. 4, 5, 6, and 7 focused mainly on the managerial approach, Chaps. 8 and 9 focus on the opportunities and challenges of promoting digital democracy. Within Chap. 8 we discuss the benefits and disadvantages of ICT-based voting machines. In particular, we analyze the opportunities and concerns regarding internet voting as a tool to replace voting per mail. In Chap. 9 in turn, we discuss how the internet can be used to improve the political culture and the dialogue between politicians and the electorate in representative democracies. As a conclusion, we summarize the fundamental aspects of digital government in the last chapter of this book. Thereby, we discuss for both the managerial and the participatory approach the major prospects and challenges ahead. We hope you enjoy reading the book.

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Abstract

The informational power and connectivity of the internet provides new opportunities for government to promote digital democracy and modernize public service delivery. In this chapter, we discuss how digital government has the potential to change government. On the one hand, we discuss how digital government enables more direct democratic elements in representative democracies and how these opportunities will put pressure on government to let citizens participate in decision-making. On the other hand, we discuss how digital government provides new opportunities for public service delivery and how it has the potential to transform the public administration towards a more citizen-oriented and transparent public service provider.

Learning Objectives*Changes induced by the internet*

- What role does the internet play?
- Which areas of government are mainly affected?

Impact on the governance of democratic processes

- What is direct democracy?
- What is representative democracy?
- Which democratic governance potential is enabled by the internet?
- What is the downside of digital democracy?
- How does digital democracy affect the representative democratic system?

ICT-driven modernization of the public administration

- What are the triggers?
- What are the key components?
- How does digitization influence public service delivery?

2.1 Changes Induced by the Internet

2.1.1 What Role Does the Internet Play?

The internet has an enormous capacity to link citizens with digital information and with each other. Information available over the internet has unique characteristics. First, information is accessible over the internet from everywhere and at any time. Second, the internet is capable of transferring digital multimedia content like dynamic images, audios, and videos. Thereby, it has the ability to transport information that is much richer than traditional media. Third, digital information is searchable. Large search engines allow users to retrieve information on a particular topic in a short time. Digital services like web crawlers can be configured to search the internet for particular information and inform the user of the existence and location of that information. Lastly, information on the internet originates from world-wide sources. Therefore, users are no longer limited to local libraries, museums, or record stores. Rather, they can read books, look at paintings, or listen to music from all around the world.

Early internet applications like e-mail, the file transfer protocol, or the web allowed only one-to-one (e.g., e-mail) or one-to-many (e.g., static web site) communication (cf. Fig. 2.1). These communication paradigms did not offer any interactivity features between users. With the development of social media technologies like forums, blogs and social networks, citizens can connect and communicate dynamically with each other as well as with a variety of entities such as political representatives, interest groups, events, or public institutions.

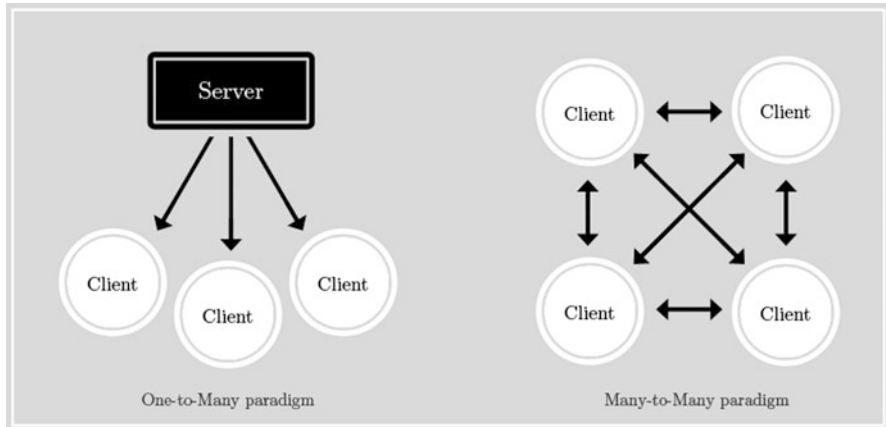


Fig. 2.1 Evolution of the internet communication paradigms

2.1.2 Which Areas Are Affected?

For many citizens in Europe, the informational power and connectivity of the internet is already ubiquitous, that is almost anyone has access to the internet. Thereby, the ability to exploit digital information and services is an important capability to succeed in society (cf. Chap. 3 The Digital Divide). It is not only government's task to fight against inequalities regarding access to ICT but also to facilitate the use of ICT by disseminating information and offering government services online.

Two areas are mainly affected by the informational power and connectivity of the internet. On the one hand, social media offers new deliberative spaces where governments can gather, synthesize, and promote political opinions and thus, increase the acceptance of political decision-making outcomes. Moreover, new political movements and issues can be identified and integrated into the decision-making process. As citizens demand more direct participation in decision-making, the internet enables new direct democratic concepts such as electronic opinion polls and internet voting. On the other hand, the increasing importance of electronic commerce has raised citizens' expectations that government should offer information and services online. With the digitization of public services governments can realize significant cost and time savings for both government organizations as well as their clients.

2.1.3 Outline of This Chapter

Overall, the internet is a powerful technology that has the potential to change the relationship between citizens and government. Within this chapter, we first discuss the implications of digital government on the governance of democratic processes.

We thereby discuss the opportunities of ICT and reflect on this in light of the enduring tension between direct and indirect forms of democracy. In the second part, we analyze the shift in the public administration reform towards digital government. Throughout this chapter, we provide references to the remaining parts of this book where the opportunities and challenges of digital government are further advanced.

2.2 Impact on the Governance of Democratic Processes

2.2.1 What Is Direct Democracy?

The idea of democracy is that all eligible citizens have an equal say in political decisions that affect their lives. In this form of democracy all citizens assemble at one place to hear speakers and vote per hand or secretly per paper ballot. In direct democracy the premise is that nothing is more desirable than the opportunity of all to share in the sovereign power of the state.

However, there are some issues with direct democracy that make this form of democracy impracticable. First, in communities larger than a small town, it is simply impossible to meet in one place, hear speakers, and vote per hand or per paper ballot on each political issue. Citizens lack the time and resources to participate in every decision that affects their lives. Even large sports arenas or conference centers cannot provide space for a community larger than a small town. Second, people simply lack the capacity to understand and decide on each legal, political, and social issue that affects them. Philosophers (e.g., Plato) even proposed that direct democracy would result in policies that are nothing more than the lowest common denominator of individual greed as voters would simply pursue their own self-interest and ignore the rights and needs of minorities in society.

Overall, opponents of direct democracy argue that due to geographical barriers, that is not all citizens can participate personally in political decision-making, and citizen incapacity, that is not all citizens can understand the whole complexity of policy-making on each individual political issue, the ideal type of governance must be some form of representative democracy.

2.2.2 What Is Representative Democracy?

In representative democracies, representatives are held accountable for their actions through fair and free elections. Political parties and individuals can participate in a pluralistic competition for government power. Citizens have the right and liberties to speak, publish, assemble, and organize their political interests (Norris 2001). Proponents of representative democracy argue that not all citizens have the resources, time, or ability to become involved in the political discourse on various political issues ranging from questions on healthcare to the adoption

of economic stimulus packages. For these reasons, citizen participation takes place in indirect form by voting for representatives and charging them with the responsibility of acting in their interest in the political decision-making process. Hannah Pitkin (1967) provides a more nuanced description of the responsibilities of a representative.

[R]epresenting . . . means acting in the interest of the represented, in a manner responsive to them. The representative must act independently; his action must involve discretion and judgment; he must be the one who acts. The represented must also be (conceived as) capable of independent action and judgment, not merely being taken care of. And despite the resulting potential for conflict between the representative and the represented about what is to be done that conflict must not normally take place. The representative must act in such a way that there is no conflict or if a conflict occurs, an explanation is called for. He must not be found persistently at odds with the wishes of the represented without good reason in terms of their interest, without a good explanation of why their wishes are not in accord with their interests. (Pitkin 1967, p. 209)

Hannah Pitkin (1967) emphasizes the role of communication between representatives and the electorate. In order to avoid disenchantment with politics, representatives have to foster a political culture between them and their constituents which resolves misunderstandings and conflicts. On the one hand, representatives have to understand what the interests of the constituents are. On the other hand, representatives have to explain their decisions in terms of why there is a conflict between the wishes and interests of constituents.

Critics of representative democracy argue that representative democracy has considerable short comings mainly originating in the centralization of power in elected representatives.

Unfortunately, the technology and institutions of democracy are no longer keeping up with its growth. Many societies continue to have democratic ideals but not an informed and engaged electorate able to act upon those ideals; nor is there any simple formula for representative democracy that relates popular preferences to political outcomes in larger political fora. (Heeks 1999, p. 214)

As a result, representatives are unable to fully act in the interest of the represented and constituents lose confidence in the political decision-making processes.

2.2.3 Which Democratic Governance Potential Is Enabled by the Internet?

Digital government enables alternatives to representative democracy mainly by overcoming geographical barriers that have previously impeded more public participation in political decision-making processes, by giving people access to relevant information on political issues and by reducing costs for elections or policy referenda. In fact, many disenchanting voters are demanding the introduction of more direct democratic elements into the governance of democratic processes.

A deep cynicism toward the representative-democracy model is emerging in many democratic societies [...]. The cynicism is created, in part, by democratic processes that foster self-interested groups over wisdom, deviation over tolerance, short-term gain over spirituality, fierce economic competition over collaboration, and community change over stability [...]. The cynicism is not directed toward democratic principles, but toward the governance of democratic processes in a variety of contexts. (Kakabadse et al. 2003)

There are many opportunities enabled by digital government that can improve public participation in decision-making. ICT can be used to gather political attitudes and opinions of the public. By doing so, ICT enables new ways to build consensus and common ground. Compared to a physical town hall meeting, the internet can enlarge the scope of political dialogue from a small number of politically interested to a large number of internet community members. Through the internet, representatives can provide better explanations of their decisions and ideas. They can exchange and incorporate the ideas and feedback of constituents. Ultimately, ICT has the potential to transform the relationship between represented and representatives (Kakabadse et al. 2003). We will discuss technologies that can be used to improve participation in the political decision-making process in a later chapter (cf. Chap. 9 E-Participation).

Apart from exchanging ideas and receiving feedback on policy initiatives, digital government can also enable new forms of voting. By using the internet, citizens can assemble at one place to hear speakers and vote per mouse click on policies from their home computer. Bishop et al. (2002) discusses an alternative form of representative democracy, in which representatives put each policy up for vote and act on the majority view of those who responded. In this model, the representing does not involve any independent discretion and judgment. Rather, political power is under the direct control of those who participate in the decision-making process. Internet voting is the technological means to implement these alternative forms of governance because it significantly reduces time and resources to implement direct participation and may motivate citizens to vote more frequently and on more issues (cf. Chap. 8 E-Voting).

2.2.4 What Is the Downside of Digital Democracy?

If citizens use digital government to influence the representative's agenda on a daily base, one serious problem becomes evident: while citizens use the internet to influence the political discourse, they are not held accountable for their impact on political decisions in the representative system. In turn, representatives who only aggregate the will of their electorate are held accountable for political decisions that in fact their electorate are responsible for.

This separation of responsibility and accountability is one of the major downsides of digital democracy in a representative democracy (Kakabadse et al. 2003). At worst, citizens may only pursue their own self-interest and ignore the rights and needs of minorities in society. The result would be policies that are nothing more than the lowest common denominator of individual interests and desire for

personal security. In times of economic or political crisis, the inability to reach a quick and factual decision could also be very dangerous. Thus, caution has to be exercised when digital democracy redistributes political decision-making power back to the electorate. In fact, representative democracy in its current form has the intrinsic value that representatives can be held accountable for their actions and decision-making processes can be completed more quickly.

Inequalities regarding access to ICT are another potential downside of digital democracy. Citizens with limited access to ICT or limited ability to exploit ICT may not be able to influence the political discourse. Thus, disadvantaged groups like elderly, low-educated, or low-income people do not have a say in the political decision-making process. We discuss this issue in more depth in the Chap. 3 The Digital Divide.

Furthermore, existing digital democracy tools (cf. Chaps. 9 E-Participation and 8 E-Voting) cannot guarantee against security failures. Security failures could have tremendous effects on political outcomes. For example, if a voting system is tampered with political outcomes may only represent the will of software vendors or programmers instead of all eligible voters. These security risks may be inherent in the voting system but might also be caused by viruses on the personal computers of voters. Even if security failures do not occur, voters and candidates need to believe that the outcome is accurate and honest. If voters and candidates do not trust digital democracy, its introduction may threaten the integrity of democratic processes and in the end the legitimacy of the result. We discuss the challenges of various voting technologies in the Chap. 8 E-Voting.

2.2.5 How Does Digital Democracy Affect the Representative Democratic System?

In representative democracy, representatives typically have a conflict of interest. On the one hand, they are held accountable by their electorate. On the other hand, most representatives are made to follow the political party when voting, as dictated by the party leadership (cf. Box 2.2). Digital democracy enables citizens to have direct access to their representatives (legislature), the public administration (executive), and legal authorities (judiciary) on a daily basis. Moreover, ICT enhances the communication between citizens and political parties, interest groups as well as news media. Thus, digital democracy has the potential to diminish the mediating power of interest groups, political parties, or the news media and to strengthen the direct influence of citizens on governments (cf. Fig. 2.2 and Box 2.2.).

Apart from new possibilities to influence decisions, digital democracy enables citizens to better monitor the views, decisions, and votes made by their representatives (cf. Box 2.3), public servants (cf. Chap. 2 Open Government), or judges. In turn, governments can use digital democracy to better explain their decisions using blogs, forums, or social networking sites. Overall, digital democracy may affect governments in some fundamental ways: The selection of political representatives may be based even more on a free competition of ideas. The power base may be

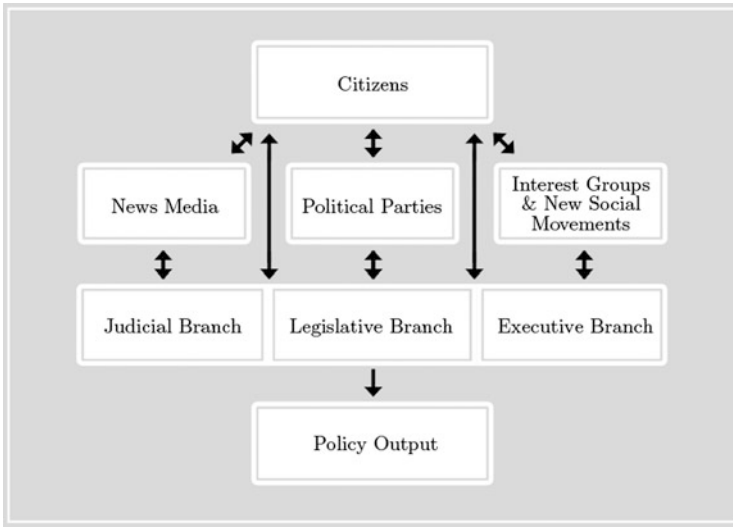


Fig. 2.2 Digital political system (Adapted from Norris 2001)

shifted away from parliament towards a power base that is more decentralized. The overall impact of digital democracy on the political system will depend highly on the ICT infrastructure a country has and the degree to which rules about information and communication allow pluralistic competition, participation as well as civil and political liberties (Norris 2001). Therefore, the digital divide has to be a central concern for proponents of digital democracy.

Box 2.1 Conflict of Party System with Digital Democracy

Mark Latham, a former Australian Labor Party representative for Werriwa, started an internet experiment in 2001. He motivated the project with the argument that many constituents feel left out of the decision-making process. His declared goal was to give people a direct say in the decisions which affect their lives and values.

“Once a week I will put a question to the electorate, asking people to vote by e-mail. I will then be obliged to act on the majority view, ensuring the Werriwa decision is advanced within parliamentary debates, the Labor Caucus and the media. The results of each vote will be listed on my website, along with the action that I have taken on the electorate’s behalf. This will make me more accountable as an elected representative. The people of Werriwa will be able to assess how effectively I have implemented their views and then make appropriate judgments at election times (qtd. in Bishop et al. 2002).”

(continued)

Box 2.1 Conflict of Party System with Digital Democracy (continued)

Latham's experiences highlight the problems that the introduction of digital democracy faces. While Latham used poll results that supported his own beliefs and party's politics to exert pressure on the governing party, poll results that were in conflict with his own beliefs or that of his party, were only taken by him as an occasion to rethink his position but not necessarily to adjust it. Latham claimed that certain issues were best handled by experts. In contrast, value judgments and moral concepts should be decided by constituents directly. Two major problems remain. First, how can you distinguish between issues that require expertise and those that require value judgments, that is for which issues do we need direct and for which issues indirect democracy? Second, can a moral question ever be brought in an uninfluenced fashion to the constituents or is the outcome of such referenda only the result of press or new media influence? (case taken from Bishop et al. 2002)

Box 2.2. New Political Parties

The impact of digital government can also be observed by the formation of new political parties who include the ideas of digital government in their political agenda. The Pirate Party, short - Pirates, is a political party which was founded in September 2006. They can be seen as a descendant of the Swedish 'Piratpartiet'. The pirates see themselves as a party of the information society. Between 2011 and 2012, the party has succeeded in attaining a high enough voter share to enter four state parliaments in Germany (Berlin, North Rhine-Westphalia, Saarland, and Schleswig-Holstein).

An important part of their agenda is driven by international movement to shape the "digital revolution," which is a circumscription for the transition into the information society. With their focus on freedom in the net and their fight against government regulations in this sphere, they received the attention especially of the young voters. Even if the network policy is the core identity of the party, it is now more than just an advocacy party of "digital natives" and characterizes itself as a social-liberal-progressive.

The party favors the civil right to information privacy and reforms of copyright, education, genetic patents, and drug policy. It promotes in particular an enhanced transparency of government by implementing open source governance and providing for APIs to allow for electronic inspection and monitoring of government operations by the citizen. The Pirate Party also supports direct democracy via e-democracy. Overall, the pirates try to utilize ICT for empowering their supporters to influence the party program as well as voting behavior of delegates.

Box 2.3 Monitoring Representatives

Apart from new political parties, private initiatives have also started to make political decision-making processes more transparent to the citizens. In Germany which is a typical representative democracy with only a few elements of direct participation a new website called “CandidateWatch” has started which monitors the voting behavior of parliament members and allows citizens to directly question their representatives. In Germany, there is a one chamber federal parliament, the 622-member Bundestag. And there are the parliaments of the individual federal states, the Landtage or Bürgerschaften with fifty to two hundred members each. All these parliaments are monitored by the web site.

“We are witnessing nothing less than the end of back room politics. The change began in the city of Hamburg which is also a federal state of Germany. Then came the entire Federal Republic. The media caught on in Germany. Spiegel Online, the number one on line publication here, as well as the Süddeutsche Zeitung, the daily paper with the biggest circulation, have become two of the many partners of abgeordnetenwatch.de. When the more traditional media are mentioned something else comes to mind. MP’s did until now not waste much time on yesterday’s news. What did they promise before the last election? Who gives a darn? No one remembers anyway. Now, with a site like abgeordnetenwatch.de a virtual voter’s memory has come into existence. We will not forget.”

CandidateWatch is a nonpartisan, nonprofit project which helps to make election campaigning more transparent and politicians more accountable. Citizens can ask questions and find out what the candidates personally stand for in order to be prepared for election day. Questions and answers remain in the public domain after the election. Moreover, CandidateWatch has also been introduced in other European countries such as Ireland. For the most recent Irish elections to the European Parliament, candidatewatch.ie was visited by 150,000 users.

Summary

Historically, representative democracy has been seen as the closest approximation for all to share government power. The advent of digital democracy enables new opportunities for improving participation and enabling direct influence in the political decision-making process. The major downsides of digital democracy are that citizens cannot be made accountable for their exertion of influence, the digital divide, and the potential of security failures which could harm the legitimacy of political outcomes. Digital democracy

(continued)

Summary (continued)

may affect representative democracy in some fundamental ways. We believe that political representatives will increasingly be selected based on a free competition of ideas and political power will diminish the role of political parties, news media, and interest groups, while strengthening the direct influence of citizens in the political decision-making process.

2.3 Impact on the Modernization of the Public Administration

2.3.1 What Are the Triggers?

The rationalization of public administration was fostered in the 1980s along the line of new public management (NPM). Traditional administrative practices have been driven by principles of impersonality, equality, and fairness. In this light, NPM can be seen as a shift from these principles to a more efficient and customer-oriented approach. NPM assumes that more market orientation in public administration leads to greater efficiency and effectiveness, without having negative side effects on other objectives and considerations. The NPM reform has led to a decentralization and disaggregation of organizational forms with the main goal of better serving citizens' needs (Cordella 2007).

Despite many efforts to transfer a private management culture to the public sector, a purely NPM-driven reform has essentially died away during the last two decades and has been replaced by an ICT-driven modernization of the public administration (Dunleavy et al. 2006). While ICT has been used in public administrations already for decades, the early waves of IT changes had very limited transformative impact. The difference of digital government compared to early use of ICT in the public administration is the growth and ubiquity of technologies such as internet, e-mail, and the web and resulting advancements of IT systems from only affecting back-office processes to transforming the relationship between the administration and civil society (Dunleavy et al. 2006, p. 478).

The ICT-driven modernization is mainly driven by information and behavior changes in civil society. The digitization of private firms, value-chains and procurement activities in cognate industries such as banking, insurance, or travel firms has been a good role model for public administrations. As the behavior of consumers and businesses change, these groups have developed expectations on the administration to shift and digitalize in parallel ways.

2.3.2 What Are the Key Components?

The impact of digital government practices in the public administration is manifested under three main themes (Dunleavy et al. 2006). First, ICT enables one to reintegrate administrative processes into the public administration. While one key aspect of

Table 2.1 Shifting paradigms in public service delivery (Tat-Kei Ho 2002)

	Traditional bureaucracy	Digital government
Orientation	Production cost-efficiency	User satisfaction and control, flexibility
Process organization	Functional rationality, departmentalization, vertical hierarchy of control	Horizontal hierarchy, network organization, information sharing
Management principle	Management by rule and mandate	Flexible management, interdepartmental team work with central coordination
Leadership style	Command and control	Facilitation and coordination, innovative entrepreneurship
Internal communication	Top-down hierarchical	Multidirectional network with central coordination, direct communication
External communication	Centralized, formal, limited channels	Electronic exchange, no face-to-face interaction (so far)
Principles of service delivery	Standardization, impartiality, equity	User customization, personalization

NPM was to disaggregate and outsource administrative functions, the reintegration of these functions can be seen as an answer to problems of the disaggregation phase. For example, while disaggregation led to heterogeneity and dispersiveness, the standardization of front- and back-office infrastructure allows reintegration of ICT systems into one public data center. Second, techniques like “end-to-end” reengineering of processes or “one face to the customer” aim to improve the responsiveness, flexibility, and agility of public services. Hereby, concepts like one-stop-government aim to improve the efficiency of public service delivery (cf. Chap. 5 Online One-Stop Government). Finally, the digitization of processes opens up the opportunity of fully digital operations of the administration. The digitization of the administration also enables new concepts such as co-production or open innovation with private firms as well as moving towards a more open and transparent delivery of public services (cf. Chap. 2 Open Government).

2.3.3 How Does Digitization Influence Public Service Delivery?

Digital government promises to fundamentally and positively change the relationship between the administration and interest groups by improving public service delivery for many types of public services. One of the common reasons for low trust and confidence in the public administration are perceptions that the administration works inefficiently and thus, wastes tax-payers’ money. Citizens have growing expectations of how effective, efficient, and transparent the administration should be. As a consequence of these expectations, the administration has adapted a more user- and process-oriented approach which requires an integration of various government organizations in a shared information network (cf. Table 2.1).

The online one-stop government concept (cf. Chap. 5 Online One-Stop Government) integrates public services from a customer point of view into a single electronic access point. This reorientation is also reflected in more flexible, interdepartmental team work or more horizontal and innovation-oriented organizational structures. The potential of digital public service delivery is to significantly improve the service experience with government services and to establish the image of a responsive, accessible, efficient, and effective public administration.

Moreover, the digitization of the public administration enables new opportunities for a more transparent, participatory and empowering public administration. The key idea of open government is that all government organizations should be more transparent and should provide the public with clear, regularly updated information on all aspects of their operations and decision-making processes. Beyond this, open governments should pro-actively seek citizen input in all its activities from user involvement in shaping services to public participation in policy-making. Finally, public institutions should seek to act as platforms for public value creation. In particular, government data and government services should be made available in ways that others can easily build on (cf. Chap. 2 Open Government).

Summary

The modernization of the public administration is driven by information and behavior changes in civil society and growing expectations of citizens in relation to a more efficient and transparent public administration. The overall goal of digital government is to provide services in a more “customer”-oriented manner and open the public administration by providing all kinds of information on the activities and decision-making processes of the public administration.

Chapter Summary

The informational power and connectivity of the internet provides new opportunities for government to promote digital democracy and modernize public service delivery. On the one hand, digital democracy enables more direct democratic elements in representative democracies. Therefore, proponents put pressure on the government to enable more direct participation in the political decision-making processes. As a consequence digital government has the potential to redistribute the political power back to the citizens. On the other hand, ICT enables new opportunities for public service delivery. Citizens demand a more efficient, effective, and citizen-oriented public service delivery. Moreover, the public administration should be transparent by default, should seek citizens’ input, and should provide public services in a way that others (e.g., local businesses) can easily build on. We will discuss in Chaps. 5 and 6 (trends in digital public service delivery) as well as 8 and 9 (trends in digital democracy) how the new opportunities enabled by digital government can be implemented.

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Abstract

Despite the undoubted potential of the internet to improve public service provision and citizen engagement, the digital divide phenomenon remains one of the main barriers to migrating administrative and political processes to the internet. This chapter elaborates why the digital divide is an important issue for policy-makers in social welfare states. Moreover, a digital divide framework is presented which highlights the multidimensional nature of the phenomenon. On the basis of this framework, current European activities to bridge the digital divide are discussed. Finally, the consequences of the digital divide for digital government are analyzed.

Learning Objectives*Introduction*

- Why is the digital divide important?
- Will the digital divide phenomenon disappear eventually?
- Will ICT exacerbate or ameliorate social inequality?

The Capability Approach

- How does the capability approach relate to other theories of justice?
- What are the key concepts of the capability approach?
- How does the capability approach relate to the digital divide?

A Multidimensional Concept

- What are the different dimensions of the digital divide?
- What is meant by ICT?
- What is meant by access?
- What distinguishes advantaged and disadvantaged groups?

European Digital Divide Initiatives

- What is the “Digital Agenda”?
- What are examples of European initiatives fighting to close the digital divide?

Consequences of the Digital Divide for Digital Government

- How does the digital divide influence public service delivery?
- How does the digital divide influence political processes?

3.1 Introduction

3.1.1 Why Is the Digital Divide Important?

Social scientists have recognized that inequality regarding access to ICT limits people’s ability to participate in the information society where the creation, the distribution, and the use of information is a significant economic, political, and cultural activity. ICT helps people to engage in activities such as searching and applying for jobs on the job market. Also e-learning, which includes all forms of ICT-supported learning and teaching, simplifies access to good education for people. Apart from these economically or socially valued activities, ICT also allows people to better engage in political processes that aim to improve their social or physical environment. In times of growing skepticism of political decision-making, people can be better integrated throughout the whole life cycle of the political decision-making process. Thus, it provides new deliberative spaces for political discussions. ICT also empowers people to engage in significant social interactions facilitating the identification and the establishment of new social groups with shared political, cultural, and/or economic interests. Finally, ICT creates a space where significant consumption activities take place and where consumers are able

to order and pay for services and goods conveniently from their home computer. Through its effects on commerce, ICT provides access to low-priced products and novel ICT-enabled information services. In a nutshell, without access to ICT, disadvantaged groups do not have the freedom to engage in all of these valuable activities. Thus, despite its initial potential to combat social inequality, it remains to be seen in which areas ICT will exacerbate and in which it will ameliorate social inequality.

3.1.2 Will the Digital Divide Phenomenon Disappear Eventually?

It has been proposed that a new generation of young people that have grown up with ICT, so-called “digital natives,” are inherently used to new technology and that “digital immigrants” who learned to use ICT at some stage during their life are fundamentally different with respect to their abilities to exploit ICT. This view implies that the digital divide phenomenon will disappear in the course of time. Consistent with this view, Roger’s (2003) innovation diffusion theory suggests that nonadopters lag behind early adopters of ICT mainly because the former have not yet learned of the existence of an innovation and that differences with respect to ICT access diminish over time.

However, empirical findings show that “digital natives” are not as homogenous and high skilled as suggested by the dichotomy of natives and immigrants. Rather, these studies suggest that ICT access varies significantly from one activity to another within the group of “digital natives.” Thus, proposing that the gap between those with higher levels and those with lower levels of ICT capabilities will be completely closed at some time can be highly questioned. In particular, the multi-dimensional and dynamic nature of the digital divide phenomenon as we will discuss later fuels the concerns of social scientists and policy-makers.

3.1.3 Will ICT Exacerbate or Ameliorate Social Inequality?

When looking at the characteristics of disadvantaged groups, one can observe that groups with lower levels of access to ICT are the same groups that have lower access to education or income. Therefore, the question arises as to what exactly is new about the digital divide compared to other unequally distributed scarce or immaterial resources. In seeking an answer to this question, van Dijk (2006) identifies the characterization of the information society as a fruitful avenue and points to three properties of information as a basic source of digital inequality.

First, information is essential for the survival and self-respect of individuals. Thus, information is a primary good which John Rawls (1971, p. 62) describes as “things that every rational man is presumed to want.” Although the minimum amount of information that is required seems difficult to assess, at a time when digital information is replacing traditional media (e.g., print media), digital illiteracy has to be combated by society just like traditional literacy. Second, information

is also a positional good. The role one plays in social networks and the amount of valuable information one possesses determines one's potential power in a community or in society as a whole. Lastly, information can be also a source of skill. Studies show that candidates for a job position who demonstrate good skills in relation to exploiting ICT are better off than candidates with low skills. Thus, the ICT skill premium is one of the causes of income inequality.

In the light of the effects of digital information on people's outcomes and the vast amount of content and services available over the internet, many observers suspect that ICT will inevitably reinforce the gap between the information "haves" and "have-nots" and the rich and the poor in the information society.

3.1.4 Outline of This Chapter

Research on the digital divide is concerned with the characteristics of disadvantaged groups, consequences of the digital divide, as well as the effectiveness of institutional interventions aimed at overcoming inequalities regarding ICT. In the following section, we introduce the capability approach which serves as a basis for researchers and practitioners in addressing social inequality, followed by a discussion of how to apply the capability approach to the digital divide phenomenon. The different dimensions of the digital divide are presented in section three. Thereby, we present a digital divide framework which provides a more elaborate perspective on the phenomenon. In the subsequent section, we present how the European Union is addressing inequality regarding ICT and give examples of initiatives trying to cope with certain dimensions of the digital divide phenomenon. Finally, we discuss the implications of the digital divide for the migration of administrative and political processes to the internet.

3.2 The Capability Approach

3.2.1 How Does the Capability Approach Relate to Other Theories of Justice?

Most theories of justice differ in terms of what they take to be the central social exercise in which equality is to be demanded. Take, for example, communists who strive to distribute goods in some equal manner, income-egalitarians who ask for equal incomes, or classical utilitarians who insist on equal weights on the utilities of all. Amartya Sen (1992), Nobel Prize winner for his contributions to welfare economics, doubts that complete equality in the distribution of any ability, resource, or outcome is ever achievable. Rather, he proposes that human development should be evaluated with respect to the capabilities people have to live a valuable life. The practical implication of this approach is that policy-makers who want to improve social welfare have to focus on expanding people's freedoms to

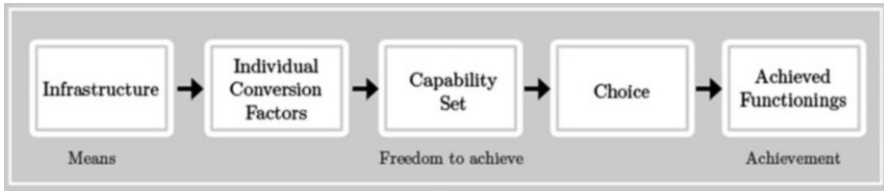


Fig. 3.1 The capability approach (Based on Alkire 2005)

enjoy things they value. As argued by Sen (1992), if equality is to be demanded in any space, it is to be demanded in the space of capabilities.

The capability approach can be used as a normative framework for the evaluation of individual well-being, the design of policies, and the formulation of proposals of social change in society. In the past decade, the capability approach has gained enormous popularity among researchers and practitioners and also serves as the theoretical basis of the UN Human Development Index, which evaluates nations with respect to the opportunities people have in terms of health, education, and employment.

3.2.2 What Are the Key Concepts of the Capability Approach?

Figure 3.1 gives an overview of the capability approach by representing a person's capability set in relation to her or his social and personal context. A person's capability set is mainly influenced by the infrastructure the person possesses and the way a person is able to convert this infrastructure into a set of capabilities. The capability set represents the opportunities a person has to live one type of life or another. The actual achieved outcomes are determined by the free choices made by the person out of the opportunities enabled by the capability set.

We illustrate the difference and interrelationships between means (or infrastructure), freedom to achieve (or capability set), and actual achievement (or functionings) by the example of a car which an individual possesses. The car is the infrastructure and mobility might be one of the capabilities that possessing a car enables. The mobility a car provides is not the same for all individuals but shaped by individuals' internal characteristics (such as gender or health) or external circumstances (such as public policies, climate, or social norms). For example, if a person is disabled, then the car will be of limited help to convert the car into mobility. If a public policy does not allow certain persons (e.g., under-age persons) to drive cars, the car does not influence the individual's mobility. Finally, whether the mobility is used by the person to drive to a distant job interview which might result in a new job position depends on the free choices the individual makes, for example whether the individual uses the car to drive to the job interview or not. Thus, capability sets offer individuals the freedom to achieve outcomes they value. And the things people choose to achieve are influenced by their personal preferences.

3.2.3 How Does the Capability Approach Relate to the Digital Divide?

The key practical implication of Sen's capability approach is that policy-makers should focus on the identification and evaluation of actions that contribute to social welfare, that is increasing the set of opportunities for people to do things they value. This involves some normative judgment on what people value and the capabilities needed to achieve these outcomes. For example, the UN Human Development Index assumes that life expectancy, literacy, education, and standards of living of a country are important capabilities which can be assessed to measure human development. Inequality regarding ICT access limits people's opportunities to achieve valuable outcomes such as finding jobs, obtaining education, accessing government information, participating in political discourse, and building networks of social support. In order to achieve these valuable outcomes, IT policy-makers in Europe have started to launch initiatives that foster participation of all individuals and communities in all aspects of the information society. Thereby, policy-makers focus on the infrastructure and groups with limited ability to convert the infrastructure into capability sets. We will introduce more detail on European activities fighting to close the digital divide in a later section.

Summary

To sum up, the capability approach highlights why policy-makers and social scientists have intensively cautioned against the consequences of the digital divide. The ability to fully exploit ICT is an important capability set that enables individuals to achieve things they value. Moreover, providing the ICT infrastructure is not sufficient. Rather, persons' internal characteristics and external circumstances influence how means are transformed to capability sets. The practical implication of this is that policy-makers have to focus on providing means and supporting individuals with weak personal conversion factors (e.g., elderly people). The capability to exploit ICT gives people the freedom to achieve things they value such as access to jobs or education or participating in political discussion or other social activities. In the following section, we develop a conceptualization of the digital divide phenomenon to better classify, assess, and understand the areas and effectiveness of digital divide policy-making.

3.3 A Multidimensional Concept

3.3.1 What Are the Different Dimensions of the Digital Divide?

The major challenge of the digital divide phenomenon is its multidimensional nature. If the digital divide was simply unidimensional (e.g., measured as whether a person has access to the internet or not) and if there was political will to bridge this

gap, the digital divide would be overcome in the course of time. In order to better classify and understand the digital divide, we present a digital divide framework in the following. The framework is centered on our definition of the digital divide. The digital divide refers to inequality regarding *access* to *ICT* between *advantaged and disadvantaged groups*. This definition of the digital divide appears to be a simple premise. However, according to Selwyn (2004), several questions have to be reconsidered to move towards a more elaborate and realistic understanding of inequalities in the information age: (1) what is meant by *ICT*, (2) what is meant by *access*, and (3) what distinguishes *advantaged and disadvantaged groups*? These questions are now discussed in turn in the following sections.

3.3.2 What Is Meant by ICT?

One ambiguity in our perspective on the digital divide relates to what the term “digital” in digital divide and thus, the term *ICT* actually refers to. *ICT* is not a fixed object, but rather a more general term that encompasses computers, the internet, middleware as well as necessary software, storage, and much more. The umbrella term *ICT* is also a moving target considering the short innovation life-cycle of *ICT*. Thus, whether groups have access to *ICT* or not can mean very different things at different times and in different studies on the digital divide. Moreover, the determination of which *ICT* means are necessary to build up a valuable capability set to fully exploit *ICT* is subject to public scrutiny and public discussion over time.

One potential solution to guide this discussion is to focus on digital content and services rather than on technological platforms. Taking this perspective, the digital divide can be seen also in terms of the digital information and services that people are accessing via *ICT*. As most internet resources like web sites or hosted storage services are accessible through a variety of platforms (e.g., computer or mobile telephones), focusing on content rather than on devices might be a more accurate and useful point of reference (Selwyn 2004). In the following, we take this narrow view on *ICT* and define it as all technological means giving people access to digital content and services. While this view also implies that access to *ICT* remains a moving target, it highlights that *ICT* is only a means to a certain end (i.e., accessing digital content and services). As we discussed earlier, the properties of digital information and services (primary good, positional good, source of skill) are a basic source of social inequality in the information society and needs to be overcome.

3.3.3 What Is Meant by Access?

The second ambiguity in our perspective on the digital divide relates to what the term *access* actually refers to. At the beginning, digital divide research mainly focused on the number and categories of groups having computers and an internet connection. Later on researchers went beyond physical access and paid more attention to the



Fig. 3.2 ICT access stages

social, economic, and cultural aspects of gaining access or to the concepts of digital competences and actual use of ICT. In the following, we draw on van Dijk (2006, p. 224) and introduce an ICT access framework which assumes that access is a “process with many social, mental and technological causes and not . . . a single event of obtaining a particular technology.” In this framework, motivational access is placed in front of physical access followed by skills access and usage access. We will explain each process step and its causes in the following (cf. Fig. 3.2).

Before people get any access to ICT, they have to first recognize that it is available to them and then determine whether ICT is relevant to their interests or purposes. Many elderly people do not see significant usage opportunities in digital content and services or reject the medium because they see the internet and computer games as dangerous media. Although prices for ICT are declining, many people still do not have the money for a computer or an internet connection. Also, computer anxiety (discomfort or fear experienced with using computers), technophobia (fear of technology in general), or cultural aspects play a role in explaining a lack of motivation to access ICT (van Dijk 2006). These barriers do not completely disappear with more ICT experience or with a new generation born with ICT. Rather, these personal conversion factors have to be incorporated by policy-makers.

Motivational access influences material access. Early research on the digital divide mainly focused on material access, that is whether people have physical access to computers and the internet or not. On the basis of large-scale surveys, sociodemographic factors such as income, education, age, and sex were identified that distinguish people with and without physical access. Also research on the global digital divide analyzed the phenomenon with respect to broadband and other telecommunication infrastructures. In some western countries, the physical access gap has been almost closed due to large-scale investments in the ICT infrastructure. Thus, research on the digital divide has shifted its focus more to the abilities and skills people have to fully exploit the physical access to digital content and services. Since ICT skills are much more dependent on personality characteristics and are much more complex to measure compared to physical access to ICT, closing this gap by ensuring sufficient ICT capabilities among all groups of society is a much more challenging task. Research on digital skills reveals that even among socioeconomic groups (e.g., high-income and high-educated people) there persist huge differences with respect to people’s capabilities to exploit ICT.

Measures to assess ICT skills vary considerably. In the following, we draw on van Dijk (2006) who distinguishes three basic types of ICT skills needed to fully exploit ICT. First, operational skills refer to the capability to work with the hardware and software. These most basic skills can be assessed by testing people's ability to start a computer, open the browser, and simply access web site information. Second, information skills are more sophisticated skills defined as the ability to search, select, and process information in specific sources following specific questions. This ability can be well assessed in a controlled environment in which a candidate receives a question that they need to answer by exploiting their informational ICT skills. Third, strategic skills are even more sophisticated skills defined as the ability to express oneself creatively, and appropriately, and to produce and generate content and services rather than simply to process it (Wang et al. 2012). We believe that these three types of ICT skills give people the capability to fully exploit digital information and services to achieve outcomes they value.

Actual use of ICT to exploit digital content and services is the ultimate goal of the process of ICT access. People have the freedom to choose how they utilize their ICT skills and how often they use ICT, which digital information and services they access, whether they use broadband or narrowband, and whether they only comprehend or in addition generate significant content and services and thus, actively participate in the information society.

All preceding steps of the ICT access process influence ICT usage. Motivational access is highly dependent on one's personal context and external circumstances as is material access. Skills also depend on a person's experience with using the technology. Thus, the relationship with usage is reciprocal. Also usage increases the opportunity people see to use the internet and these people are in turn motivated to obtain physical access and improve their ICT skills. Regardless of the interrelationship between the stages, all stages are important for social scientists and policy-makers to consider because they influence whether people have the capability set to achieve outcomes they value.

3.3.4 What Distinguishes Advantaged and Disadvantaged Groups?

We can characterize research on advantaged and disadvantaged groups with respect to the unit of analysis. Digital divide research has mainly looked at three different units of analysis. The individual level – which is also the focus of our discussion – looks at socioeconomic (such as income, education) or demographic factors (such as sex, age) that characterize disadvantaged groups of individuals. Moreover, some researchers have also looked at differences regarding access to ICT among organizations. In particular, small firms often do not have the human and technological resources to exploit ICT which disadvantage them in the competition with larger enterprises. Lastly, digital divide research has also been very interested in comparing differences among nations (Norris 2001). While ICT has the potential to help in unifying the world by facilitating the exchange of information and

improving mutual understanding, observed differences among developed and undeveloped countries regarding ICT access suggest that ICT rather exacerbates than ameliorates economic inequality.

Having elaborated the meaning of ICT access, we now want to discuss the factors that determine why some individuals (which is our focus here) engage more successfully with ICT, whereas others do not. Understanding the mediating factors, we present the technological capital framework as discussed by Selwyn (2004). He proposes that three different forms of capital determine the degree to which individuals can successfully engage with ICT. This view is superior compared to discussing socioeconomic or demographic factors. Prior research has shown that even among the elderly, low-income, or low-educated people, there are considerable differences with respect to their ability to make meaningful use of ICT. These differences are explained by Selwyn (2004) with variations in economic, social, and cultural capital that these individuals possess. Moreover, focusing on capital rather than on demographic factors allows policy-makers to directly counter these inequalities regarding access to ICT.

The most obvious drivers of the digital divide are differences with respect to individuals' economic capacity to purchase hardware and software. Although prices for computers, internet connections, and printers are declining, these prices combined with a perceived lack of usage opportunities hinder many low-income or elderly people in obtaining access to ICT. While economic capital might to a large extent account for different levels of engagement with ICT, it should not be overemphasized. Also social and cultural capital structures participation in the information society as both are, under certain conditions, convertible to economic capital or institutionalized in the form of ICT skills.

Cultural capital denotes the extent to which individuals or organizations have absorbed or have been socialized into the information society. Cultural capital can exist in different forms. People, who invest in self-improvement of ICT skills, for example by reading a textbook about using computers, possess embodied cultural capital. In contrast, people, who are socialized into technology use, for example by being exposed to ICT via magazines, books, or other media available in their household, possess objectified cultural capital. Lastly, people, who obtain ICT skills in the form of credentialed training, possess institutionalized cultural capital. While economic capital might be necessary to possess ICT infrastructure, people need cultural capital to make better use of the infrastructure. Thus, the levels to which people possess cultural capital highly influence their ability to exploit ICT.

Moreover, engaging successfully with ICT is also determined by social capital, that is having a social network of individuals (family members, friends, and neighbors) or institutions (help lines, after-sales support) with expertise in ICT. Social capital can be converted into economic capital when members of the social network are willing to share their expertise or access to ICT. The importance of social capital was also highlighted in a study conducted by Murdock (1996) who examined differences with respect to computer use in households:

The maintenance of particular forms of computer use will depend in large parts on access to users who can offer advice, encouragement and practical support. Conversely users who are isolated from or marginal to such networks may find it difficult to acquire competencies and sustain interest over time. (Murdock 1996, p. 273)

In a nutshell, economic, social, and cultural capacities can be used to analyze, explain, and predict how individuals, groups, or communities will participate in the information society and how participation in the information society can be increased. Therefore, policy-makers should focus on strengthening people's capital to overcome the digital divide.

Summary

The section introduced a digital divide framework that provides a more elaborate and realistic understanding of inequalities in the information age. First, we have defined ICT, that is part of the object in which equality is to be demanded, as all technological means giving people access to digital content and services. Second, we have described the social process (motivational, physical, skills, and usage access) by which individuals and organizations gain access to these means. Finally, we have argued that the extent to which individuals or organizations can access ICT can be traced back to fundamental differences in their economic, cultural, and social resources which they can build upon when trying to exploit ICT. Increasing these three forms of capital is the major concern of initiatives fighting to close the digital divide.

3.4 European Digital Divide Initiatives

3.4.1 What Is the Digital Agenda?

In 2010, about 30 % of all Europeans – largely made up of elderly people, people on low incomes, unemployed or less educated people – had still never used the internet. As the first of its seven flagship initiatives under the Europe 2020 strategy, the European Commission published the “Digital Agenda” to address challenges in overcoming these deficiencies. The digital agenda emphasizes that the benefits of the digital society should be made available to all citizens.

The digital era should be about empowerment and emancipation; background or skills should not be a barrier to accessing this potential. (European Commission 2010)

The agenda outlines concrete actions on each access stage of our digital divide framework. For example, to overcome a lack of motivational access, the agenda aims at increasing internet trust and security through EU-wide online trust marks and dispute systems. Security and trust are one of the major sources of uncertainty in using internet applications and are one of the major barriers for consumers and businesses to engage in e-commerce. In order to enhance material access, the digital

agenda sets the target to equip each household in Europe with broadband access by 2013 and to equip at least half of them with fast broadband by 2020. Moreover, the agenda aims to improve skills access by investing in the enhancement of digital literacy skills and by offering e-learning and customized education material teaching internet users how to better exploit ICT. Additionally, the agenda foresees investment in the digital distribution of cultural, journalistic, and creative content, making it cheaper and more quickly accessible and thus, setting further incentives to increase usage access to digital information and services.

3.4.2 What Are Examples of European Initiatives Fighting to Close the Digital Divide?

While the digital agenda sets ambitious objectives for the European member states with respect to the fight against the digital divide, it is mainly left to the national, regional, and local authorities as well as private organizations to start, operate, and evaluate concrete projects. In the following we give some examples of initiatives aiming to reduce inequalities with respect to people's access to ICT. More cases can be found on the ePractice portal created and operated by the European Commission which offers cases on digital divide initiatives under the label "eInclusion" (cf. <http://www.epractice.eu/en/cases/>).

Box 3.1. Project: Hungarian Initiative "Click on It Grandma!"

"Click on it, Grandma!" is a project initiated by the Budapest Cultural Center and aims at increasing the digital skills of older people. Launched in 2002, the learning program was first offered in Budapest with the idea to enable senior citizens to fully participate in the Hungarian economy and society as well as to improve their quality of life through educational programs. The initiators emphasize that older people tend to be less open to new technologic novelties and therefore need to be educated in order to keep up. Ten different courses are offered and focus on how to write e-mails, surf the web, find useful information, and manage digital files. During and after the course, participants have access to computer points free of charge. The training sessions are carried out using a specially developed textbook and a website for further reference. Professional trainers assist during the exercises. Because of its success, the program was extended beyond Budapest and transformed into a national education program, offered in 12 different cities across the country. Approximately 1,200 senior citizens completed the course in 2007. Moreover, former participants founded so-called "Grandma clubs" that bring people together to talk, learn, and share their experiences (more information on <http://www.epractice.eu/cases/clickonit>).

Box 3.2. Project: ECDL Initiative in Austria

The initiative “European Computer Driving License (ECDL) barrierefrei” is the Austrian implementation of the European ICT literacy certification. The program seeks to improve the IT skills of people with disabilities, enabling them to find employment and to increase awareness of the needs of disabled people among the general public. The standard materials provided by the ECDL foundation were adapted for people with a wide range of disabilities by offering alternatives to keyboard and mouse input, such as on-screen keyboards, hands-free mice for paralyzed people, and Braille displays and speech output for visually impaired users. In view of our digital divide framework, the project aims to improve the ICT skill access of people with disabilities.

Thereby, the project tends to improve people’s institutionalized cultural capital by providing them with a credited ICT qualification (more information on <http://barrierefrei.ecdl.at/>).

Box 3.3. Project: “Eldy in Piazza”

The project “Eldy van on the square” (“Eldy in piazza”) aims at bringing people in rural areas together with computers and internet access. Launched by the Italian NGO “Eldy” in 2009, the project’s initiators drive with a customized van equipped with computers and training materials through small towns in the north of Italy. Eldy states that people in rural areas often lack access to computers; this is also the result of a reluctance to try new technologies in their culture. Volunteers and professional trainers offer free training sessions on the free-to-use “Eldy” platform, which is tailored for computer beginners. A typical “Eldy” course explains to the participants how they send e-mails, chat with people over the Internet, get in touch with their family via video calls, and how to organize digital documents or photos. Free training materials are distributed and technical support is given to the participants.

Eldy reports that the project’s benefits are increased social inclusion in rural areas, improved e-democracy and e-inclusion as well as the promotion of volunteering and a cooperative spirit. Since 2009, 100 courses have been held and more than 4,000 people have been trained in the area of Veneto. The “Eldy” platform itself has more than 400,000 users worldwide and is supported by a community of volunteers (more information on <http://www.epractice.eu/en/cases/eldyvan>).

Summary

Over the last two decades, the European member states have made considerable investments to overcome inequalities regarding access to ICT. However, the digital divide is still a widely observed phenomenon. In the digital agenda of the European Commission ambitious goals are set that address various dimensions of our digital divide framework. While member states share the goal of overcoming the digital divide, it is left to national, regional, and local initiatives to launch programs to fight the digital divide. A review of cases from the practitioner platform ePractice shows that in particular elderly people or people living in rural areas are the target of digital divide initiatives.

3.5 Consequences of the Digital Divide for Digital Government

The internet is an increasingly important resource in many aspects of life, for example education, employment, government, commerce, health care, recreation, and more. We argue here that the digital divide also has important consequences for the implementation, management, use, and outcomes of public services and political decision-making processes which are discussed in the following.

3.5.1 How Does the Digital Divide Influence Public Service Delivery?

In contrast to traditional service delivery, digital public service delivery allows citizens and businesses to access public services from anywhere 24 h a day. Thereby, users can benefit from significant cost and time savings (cf. Chap. 5 Online One-Stop Government). However, only clients who have access to ICT and are able to conceive the technical terms of the public sector domain can exploit the opportunity to access and use digital public services. This has consequences for both the demand and supply side of public service delivery.

For the supply side it implies that public administrations always have to maintain the offline delivery channel because public administrations are not allowed to choose their customer base but have to ensure that all sections of the population can access public services (cf. Chap. 4 Legal Aspects of Digital Service Delivery). Therefore, they always have to maintain traditional service delivery for disadvantaged groups who are unable to access digital content and services. However, running two channels – offline and online – in parallel often eats up the efficiency gained by introducing digital public service delivery. As many of the disadvantaged groups are among those who rely most heavily on the support of public services, moving all public services to the internet is economically inefficient. Instead, public administrations should only offer digital services

where the vast majority of users have full access to these services and should rather focus on digitalizing back-office processes for the remaining services (cf. Chap. 5 Online One-Stop Government).

For the demand side the digital divide implies that users have different outcomes in relation to public services. Those clients of the public administration, who can access public digital content and services, can benefit from a higher level of flexibility as well as significant time and cost savings. Therefore, they can invest their time and resources in other valuable activities instead of waiting at public offices. Moreover, businesses that are able to integrate public services into their own business processes might have competitive advantages over businesses with lower IT sophistication. These outcome differences have to be taken into consideration when implementing and managing public service delivery.

3.5.2 How Does the Digital Divide Influence Political Processes?

While the digital divide phenomenon can somehow be handled by maintaining the offline and online channel for public service delivery, the consequences of the digital divide for political decision-making processes are much harder to estimate. Before the internet emerged, mass media, town hall meetings, or voting were typically the main channels to express and exchange perspectives about political issues and mobilize political groups. Today, citizens have additional political channels. For example, social networking websites have created new ways to socialize and interact over the internet. A possible consequence of inequalities regarding access to ICT is that groups who are disadvantaged lose influence in the political discourse. While highly educated and young people can promote their ideas on the internet and can find like-minded people from all over the world, disadvantaged groups still have to rely on traditional political channels like elections or town hall meetings. As discussed earlier, the role citizens play on social networking websites can influence their effect on peer users. Moreover, the ability of citizens to produce and generate content rather than simply to process it represents another source of inequality with respect to political power.

In a nutshell, whenever political actors or institutions use the internet to exchange ideas and opinions or even take legally binding decisions, they have to consider that the voice of disadvantaged groups might be ignored. Therefore, political decision-makers should not overemphasize sentiments in social networking platforms although this information is much easier to obtain than from offline channels such as town hall meetings or public opinion polls.

Summary

To sum up, the digital divide has considerable consequences for the implementation and management of public digital services as well as political

(continued)

Summary (continued)

decision-makers and institutions that use the internet to gather and distribute ideas and opinions on political issues. On the one hand, public administrations who wish to offer digital services have to realize that they have to maintain traditional service delivery for disadvantaged groups such as elderly, low-income, or low-educated people. On the other hand, if politicians use the internet to gather or express their views to citizens, businesses, or interest groups, they have to realize that many disadvantaged groups are left out of this political process often leading to decisions that are not sufficiently legitimized as an outcome (cf. Chap. 9 E-Participation).

Chapter Summary

This chapter has provided a deep insight into the nature of the digital divide phenomenon. In the introductory section, we discussed why the digital divide is important both today and in the long run and whether ICT will exacerbate or ameliorate social inequality. After this, we introduced the capability approach as a normative framework for assessing social inequality. Thereby, we discussed how the approach relates to other theories of justice and how it can be applied to the digital divide phenomenon. In section three, a digital divide framework was introduced that provided us with a more elaborate view on the different dimensions of the digital divide. To develop the framework, we have specified what is meant by access to ICT and analyzed the factors that underlie inequality regarding access to ICT. Equipped with a theoretical understanding of the phenomenon, we explored how the European member states deal with the digital divide by presenting different case studies. Finally, we discussed the consequences of the digital divide for the digitization of public services and political decision-making processes.

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Abstract

The rise of the internet in almost all domains of personal and business life means that the public sector is also becoming increasingly involved in digital process management. Hence, a legal basis for digital government is necessary. In this chapter, the most fundamental aspects of this young and developing field are outlined. Regulation of digital government services and delivery is globally very heterogeneous. With a focus on Europe and particularly Germany, “e-government legislation” initiatives are introduced and contrasted with the respective parallel developments in the United States of America. Secure and private communication and storage of information has been identified as one of the key drivers of digital government initiatives. Hence, legal regulations relating to encryption, data protection, and privacy stand in the foreground of this chapter. Finally, the domain of e-inclusion – the inclusion of citizens with disabilities – is addressed in the remainder of the chapter.

Learning Objectives*Introduction*

- What is the legal basis of e-government?
- What is the rule of law and its effect on governmental digitization?

Secure and Trustworthy Communication

- What do the concepts of authenticity, integrity, and verifiability mean?
- What is an electronic signature?

Data Privacy

- How does one ensure data privacy in digital government management?
- How can data privacy be implemented?
- How does one *technically* conceptualize secure data transactions?

Equal Opportunities Principle

- What is the effect of the equal opportunities principle?

4.1 Introduction**4.1.1 What Is the Legal Basis of Digital Government?**

Governments throughout the world including Europe face the rapid development of digitization of services and processes. In particular, the potential for significant cost reductions and efficiency gains is a main driver of governmental digitization. The core problem, which governments and administrations face regarding seamless digitization, is the legal basis of conducting these services. For governmental activities there is a requirement that the rule of law underlies all decisions and actions. That is, every decision that is taken requires a regulation that justifies the decision. This implies that using digital media in order to conduct governmental business requires regulations on how this digital service delivery is to be implemented.

This means that governments are confronted with a particular situation. Each administrative and governmental sector – that is different domains of private law, like contract law, social welfare regulations as well as criminal law, constitutional law etc., require individual regulations regarding their ‘digital enactment.’ This situation has led to the idea in governments of creating a horizontal layer forming the legal basis for the digital conduction of public services and processes using ICT. For example in Germany, the federal government has introduced a plan to create a specific e-government law during the legislative period 2009–2013. This initiative is attempting to bundle and harmonize the various digital initiatives in separate segments of the body of law into a homogenous canon of rules. The main objective of this regulation is to create the preconditions for secure communication between citizens, companies, and the public administration. Looking at this from

the perspective of a maturity model, this regulation creates the core brick that enables a smooth transition from the interaction to the transaction stage of e-government. One of the core components of transactional e-government is the cross-functional integration of data. At the same time these data have to be protected and handled according to the principle of data sparseness. These goals often represent contradicting agents in designing and creating integrated e-government services.

4.1.2 What Is the Rule of Law and Its Effect on Governmental Digitization?

Governments of democratic countries usually rule based on a constitution. On top of this constitution, several legal bodies are installed which regulate the different aspects of interaction between people and institutions in every life situation. The rule of law is a legal-political regime under which the law restrains the government by promoting certain liberties and creating order and predictability regarding how a country functions. It protects the rights of citizens from arbitrary and abusive use of government power. Hence, the actions of governments and public administrations have to be based on the prevailing laws.

In the last decades, ICT has increasingly been used in the public sector of most countries. Given the fact that the digital divide also applies to public representatives and government members (cf. Chap. 3 The Digital Divide), knowledge of, and trust in, digital media has entered the governmental arena from the bottom up. This has led to a massive increase of digital processes in some administrations where individuals began using, for example, a PC instead of a typewriter for certain administrative tasks. Over time, more and more hopelessly heterogeneous ICT processes began to mushroom in the different departments and regional entities of the public sector. Along with the increasing usage of data networks and connectivity, soon the problem of the need for new regulations surfaced. However, it is nontrivial to regulate an area in which de facto solutions are in place. Any attempt to regulate this area would lead to de-legalization of large parts of the existing infrastructures.

Although in ICT development everything seems to be ‘easy,’ ‘quick,’ and ‘rapidly changing,’ when one looks at the evolution of the ICT infrastructure of a country up to today one can see that it has evolved much like a city. Imagine taking the inner city of Heidelberg and trying to make it look as structured and square as Manhattan. Inevitably, many ancient buildings would have to be taken down and re-built. Despite the fact that these buildings have their own value based on their historical meaning and protection, this ‘homogenization’ would involve enormous cost. Similarly, the homogenization of ICT infrastructures challenges the public sector. Hence, it is of particular importance to develop ICT regulations which do not overburden public sector units and which also create an atmosphere of competition and innovation in service provisioning.

4.1.3 Outline of This Chapter

On the basis of the rule of law, in this chapter the fundamentals of legal regulations for digital government are introduced. It is not the intention of this textbook to contribute to literature in the field of law. There are a number of books which focus on the specificities of law and the internet. The handling of bodies of national law is very heterogeneous throughout the world and also the European Union. As an example, the reader is referred to Köhler et al. (2008).

Hence, first, the concepts of authenticity and integrity are outlined. Then, the principle of confidentiality is introduced and its determinants for public sector ICT application are outlined. Following on from this, the principle of equal opportunities is defined and conceptualized. Finally, the chapter is wrapped up by a summary of the contributions of this chapter.

4.2 Secure and Trustworthy Communication

4.2.1 What Do the Concepts of Authenticity, Integrity, and Verifiability Mean?

As stated above, one of the most important aspects and preconditions for digital government applications is secure communication between citizens, businesses, and governmental institutions. Hence, technical solutions have to be implemented that create infrastructural components that comply with this requirement. At any stage it has to be ensured that an official document which is submitted to a public authority or which a public authority transfers to a citizen or business is authentic. Nonauthentic documents are associated with the danger of falsification and fraud.

Hence, authenticity refers to the technical possibility to securely identify a signatory of an electronic document (cp. Fig. 4.1). Authenticity is usually guaranteed by a handwritten original signature of a person on a document. One way of achieving the goal of document authenticity in the digital hemisphere is through the use of electronic signatures. Later in this section, we will introduce the nature and different forms of digital signatures. The second aspect which is vital when handling documents is integrity. In traditional document handling, physically protecting files in an archive and storing them under conditions of preservation ensures integrity. Transferring this property to the digital world is not trivial. The integrity of a document can be verified by digitally signing the document and storing it securely. Together with the need for long-term verifiability, for example of official documents such as certificates, degree documents, or state contracts, this aspect creates a major task for public digital archives.

The main challenges involved in the evolution of e-government from the interactional to the transactional stage are standardization, hardware costs, acceptance, and trust. Standardization, particularly of data exchange standards, is one of the main enablers of seamless transactional e-government solutions. The existing heterogeneity of the ICT landscape in public sector institutions makes this

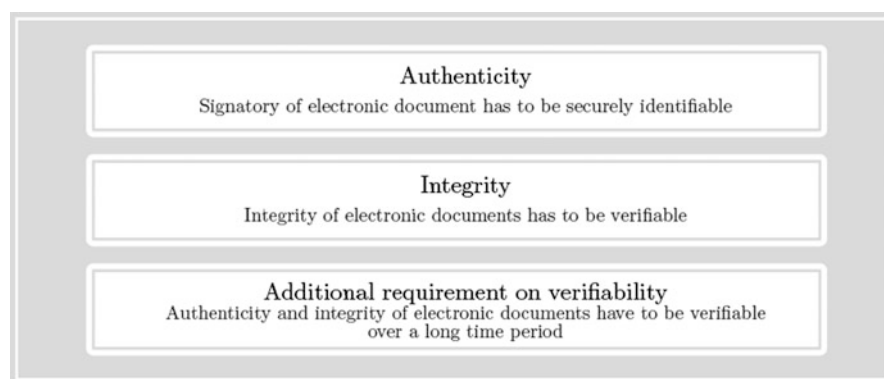


Fig. 4.1 Authenticity, integrity, and verifiability

standardization particularly difficult. Very often, public entities are independent in their decision to adopt certain technologies. In federally organized countries like Germany or the US, this leads to the situation where individual solutions are found. In Germany, each public entity has the right of local self-governance. Hence, there are about 20,000 units – municipalities, regions, offices, and federal, state, and regional institutions – that can decide on their infrastructure autonomously. Taking this structure into account it is obvious, how difficult it becomes to implement binding ICT standards. The German federal government initiated a standardization initiative called SAGA (Standard and Architectures for E-Government Applications). The aim of SAGA is to provide an open standard for government applications. For several federal institutions and federal state institutions the SAGA standard was defined as mandatory. On the level of municipalities and individual state-level institutions, SAGA was defined as a voluntary standard.

In order to facilitate the standardization of data exchange formats and public sector ICT, Germany moved from a standardization initiative to a constitutional amendment. In 2009, art. 91c was added to the German constitution, which enables the federal states to cooperate in the conception, implementation, and operation of ICT infrastructures. Furthermore, it encourages the federal states to cooperate in the definition and implementation of security standards and the enabling of secure communications. On the basis of this constitutional change, a federal IT planning council has been installed, which consists of representatives of all German federal states and has the mandate to define binding ICT standards for different applications. Although it has been a long path to the realization of this council, it is an important first step towards a stronger homogenization of the public ICT landscape. Nevertheless, there are also major factors that public policy-makers have to consider regarding the implementation of homogeneous ICT landscapes. Integrating information systems easily leads to the possibility of abuse of access to data and infrastructures. Modern democracies such as federally organized countries are based on the distribution of power. Hence, it is important to design interoperable ICT infrastructures carefully in order to maintain informational

divisions of power and self-governance of small entities like regional communities. In the public debate about strengthening central entities such as the federal government or a federal ICT council, these arguments are frequently used. Public policy-makers therefore have a much lower influence on the concrete implementation of ICT infrastructures than CIO's in private companies have. Consequently, the progress and speed of innovation in the public sector is slower. This is often perceived as a disadvantage in terms of agility of the public sector. However, seen from the perspective of the rule of law, robustness of democratic processes and obeying to the 'rule of law' is more important than highly innovative service delivery.

4.2.2 What Is an Electronic Signature?

Having introduced the importance of authenticity, integrity, and verifiability as core attributes for creating secure, robust, and confidential public service delivery, the technological fundamentals of implementing these have to be introduced. The center piece of secure digital data traffic is the digital signature. According to Article 2, Nr. 1, EU Directive 1999/93/EC on a community framework for electronic signatures the following definition holds: "‘Electronic signature’ means data in electronic form which are attached to or logically associated with other electronic data and which serve as a method of authentication."

In May 2001 the EU Directive was implemented into German national law by the German electronic signature act ("Signaturgesetz," SigG) which entails four steps as follows.

1. The basic electronic signature (cf. Fig. 4.2) consists of data in electronic form that are attached to other electronic data and which serve as a method for authentication. The simplest form of this is a scanned version of a hand-written signature. However, since this signature can be attached by third parties to any kind of document, it has no legal relevance. Authenticity and integrity are not ensured.
2. The advanced electronic signature is an electronic token that is uniquely linked to the signatory. It is capable of identifying the signatory and it is created using means that the signatories can maintain under their sole control. It is linked to the data to which it relates in such a manner that any subsequent change in the data is detectable (integrity). However, the advanced electronic signature is not created with a secure signature-creation device and also not stored by a trusted third party. Hence, this form of electronic signature is not legally binding and cannot replace official document verification. An example of a practical application of an advanced electronic signature is the PAdES (PDF advanced e-signature).
3. The next step is the qualified electronic signature. It meets all the requirements of advanced electronic signatures. On top of this it is based on a qualified certificate. Qualified certificates are issued by certification service providers (no accreditation) and must contain signature verification data which correspond to signature creation data under the control of the signatory. Furthermore,

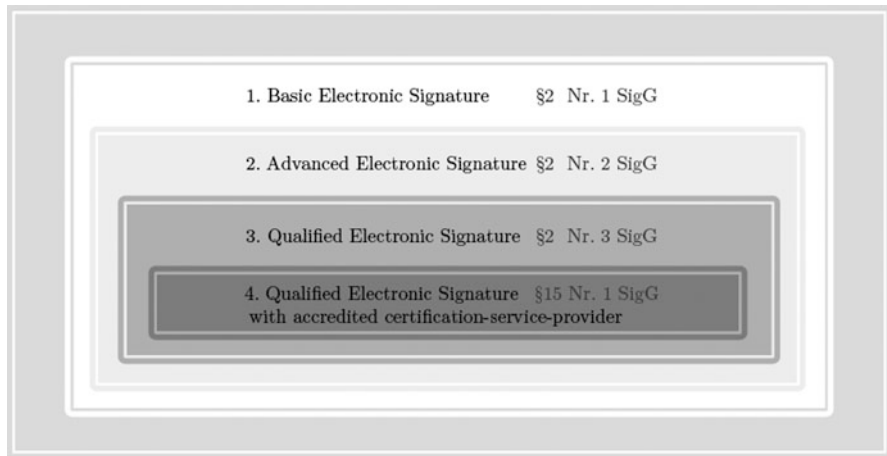


Fig. 4.2 German electronic signature act (May 2001)

qualified electronic signatures are produced with a secure signature-creation device. A secure signature-creation device is able to:

- Ensure that signature codes that are produced and transferred are unique and secret and exclude storage outside the secure signature-creation device.
 - Protect qualified certificates that are available to be tested or downloaded for unauthorized alteration and unauthorized downloading.
 - Exclude the possibility of forgery and falsification in the production of qualified time stamps.
4. The last step is the qualified electronic signature with accreditation. In this case, the certification service provider must be accredited by the competent authority upon application. The accreditation which is given to the certification service provider can show that they have the necessary reliability and specialized knowledge to operate as certification service providers. Also, it ensures that the certification service provider reliably identifies the persons who apply for a qualified certificate. Finally, they assign a signature test code to an identified person with a qualified certificate and they ensure that this can be examined and downloaded by anyone at any time using public telecommunication links. The accredited certification service provider will be provided with a quality sign by the competent authority. This step provides the highest level of legal certainty.

From the step “qualified electronic signature” onwards, cryptographic methodologies are applied. While it is not within the scope of this chapter to mathematically introduce cryptography, the general principles of asymmetric public key encryption are introduced. The interested reader is referred to Beutelsbacher et al. (2010) for the mathematical foundations of cryptography.

In public key methodologies, each user has a unique pair of cryptographic keys; a public key and a private key. Each of these keys is a sequence of characters which is unique. As the name private key shows, this key is only known to the user and

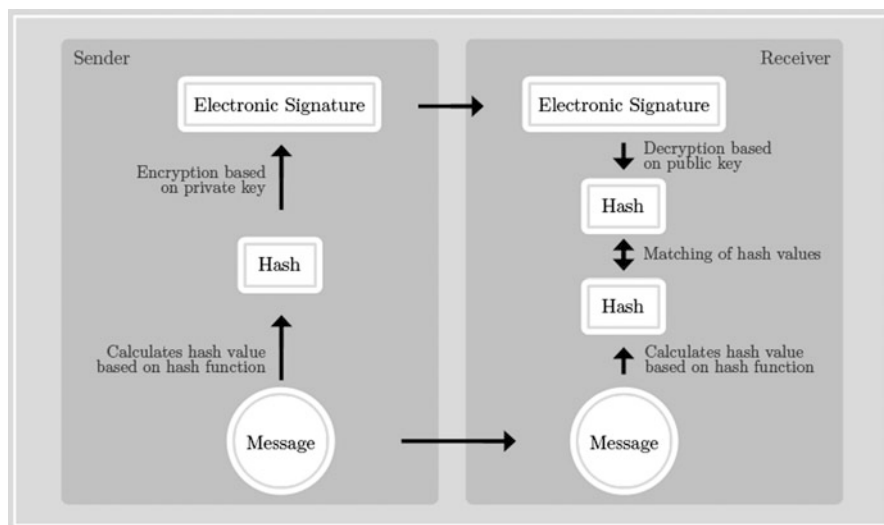


Fig. 4.3 Public key signature method

stored on a safe device (e.g., a chip card or USB-stick). The public key which is the counterpart to the private key is stored on a third-party server. As one proceeds along the security stages introduced above, the trustworthiness of the key-creating device and institution as well as the trustworthiness of the institution maintaining the public keys is increased.

The private key can be used to either sign a message or encrypt a message. The authenticity of the message can then be verified by the receiver or third party by using the publicly available key. The mechanism shows the receiver of the document whether the document is authentic or not. The probability of alteration during transit is minimized by using trust-securing mechanisms like accreditation and regular control of providers.

The public key cryptography method allows protection of the authenticity of a message by creating a digital signature of a message using the private key, which can be verified using the public key (cp. Fig. 4.3). The electronic signature of a message is created based on a hash value of a message instead of the whole message. A hash function maps an entire text or document to a short string of characters. This reduces the quantity of data that has to be transferred. A hash function has the following properties: an accidental or intentional change to the message will change the hash value; it is infeasible to find a message that has a given hash; the hash value is easy to compute.

Ideally, the signature is created using a secure signature-creation device. Although every encryption method can be theoretically cracked by investing very intense computing resources, the following aspects have been shown to make this very difficult. For a qualified electronic signature only state-of-the-art methods are allowed that rule out the possibility of manipulation or fraudulent use of electronic

signatures as much as possible. Protection of the private key of course plays a central role in the security of this principle. This can be achieved, for example, by storing the key on a secure chip card. The chip card manufacturer would have to prove that it is impossible for the key to be read out from the chip card in a non-intended way and that the signature algorithm is securely implemented. In 2009 Germany introduced a new identity card, on which citizens can securely store their electronic signature. Despite initial problems, public acceptance of this key card is increasing. Along with several other constraints one key limitation of the widespread acceptance of this device is the specific hardware (card reader) that is necessary in order to facilitate its function.

Most countries have experienced difficulties with the introduction of electronic signatures. For example, the 2001 legislation in Germany implementing the EU directive has not resulted in large-scale utilization of digital signatures in the population. This is mainly due to the difficulty of making the link between legislation and concrete implementation. In the aftermath of this legislation – which only specified the theoretical steps in order to enable digital signature technologies and did not regulate the concrete implementation – several different providers turned up on the market and implemented incompatible systems using digital signatures. In the following years, none of the *de facto* standards reached a sufficient adoption level. Therefore, digital signatures have hardly been used in practice by a broad audience. Certainly one major aspect of this technological underadoption was the fact that the maintenance of the digital signature was quite expensive for the individual. Another aspect was that only digital natives had the skill level to comfortably utilize the procedure without encountering problems as it was technologically quite demanding.

Consequently the public sector had to find other ways to create legally binding digital document exchanges and storage. In order to boost the acceptance of digital income tax declaration submissions, the financial ministries agreed to reduce legal certainty in favor of the practicability of applying the electronic submission. Therefore, they changed their regulations after the sustainably low adoption rates for qualified digital signatures and established an infrastructure which uses advanced electronic signatures. This concept immediately found a higher adoption rate as no additional hardware was necessary to utilize it. However, legally speaking it remains in a grey zone since in case of doubt courts have to decide on the validity of tax declaration submissions.

Another alternative used in various public processes in Germany is the cover sheet procedure ('Mantelbogenverfahren'). In this procedure, a digital version of a declaration or document is submitted. Only the cover sheet of the document – which contains an ID and a hash value of the entire document – is printed out and manually signed and physically posted to the authority. The result of this procedure is a reduction in physical data transfer, the avoidance of re-coding of physically printed documents (resulting in cost savings and error reductions) as well as maintenance of the necessary legal constraints.

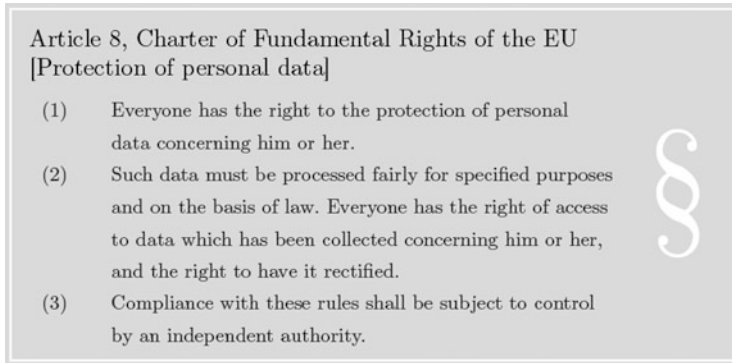


Fig. 4.4 Article 8, charter of fundamental rights of the European union

4.3 Data Privacy

4.3.1 How Does One Ensure Data Privacy in Digital Government Management?

Data privacy has been acknowledged as a fundamental element of the information society. The OECD (Organization for Economic Co-operation and Development) and the European Council issued a recommendation for member states to enact a data privacy law almost concurrently in 1981 and 1982, respectively. In 1995 the EU issued a data privacy directive and in 2000 passed a charter of fundamental rights of the European union (cp. Fig. 4.1) (Fig. 4.4).

Historically, this article in the charter of fundamental rights of the European Union goes back to the many steps along the path to societal development of individualization. One of these was the German census verdict by the constitutional court in December 1983. One of the consequences of this verdict was the right of informational self-determination. As such, it created the foundation for a new way of perceiving and treating all information concerning the individual. From this, a number of principles of data protection were derived.

In practice, it is often very difficult to ensure the proper implementation of these principles. Whether data is public or private and to what degree is an issue of permanent and ongoing debate amongst data-protection activists, data-protection officials, and operative units which process data. Many public government projects such as, for example, the introduction of a digital health information card in the German federal republic have been hampered due to data privacy concerns.

4.3.2 How Can Data Privacy Be Implemented?

Data privacy is a theoretical concept. In order to make it practical, it has to be implemented into concrete laws and regulations. These then have to be transferred

into information systems. The first law in Germany to pass parliament and be enacted was the federal data protection law (Bundesdatenschutzgesetz) in 1977. Today's version contains five principles of data protection:

1. **Principle of accuracy.** The principle of accuracy concerns the correctness of the data stored about persons. It implies that persons that are responsible for the storage and maintenance of the personal data of individuals have an obligation to conduct regular checks on the accuracy and relevance of the data recorded and to ensure that they are kept as complete as possible in order to avoid errors of omission. Beyond this, they have to make sure that the data are kept up-to-date either at regular intervals or at the point at which the information contained in a file is used, for the entire period in which they are being processed. An example is stored information about a person which is erroneously registered in police wanted lists. These have to be eliminated.
2. **Principle of lawfulness and fairness.** The principle of lawfulness and fairness regards the method of storing, collecting, and aggregating information. In times of high information availability, it is easily possible to collect and aggregate information about individuals and create, for example, profiles of individual persons. In this regard, a number of laws have been passed which regulate fair and lawful data collection. Data may not be collected and processed in an unfair or unlawful way. An example of this principle is the storage and collection of unintentionally made statements and information concerning individuals, for example, in order to evaluate information related to creditworthiness using a false identity.
3. **Principle of purpose specification.** This principle states that all collected and recorded personal data are relevant and adequate for the purpose for which they are collected and said data may not be used for a different purpose at a later date. None of the said personal data may be used or disclosed, except with the consent of the person concerned, for purposes incompatible with those specified at the time the data were collected. The period for which the personal data is kept does not exceed that which would enable the achievement of the specified purpose. An example is the banning of the systematic analysis of behavioral profiles by citizens and companies.
4. **Principle of interested-person access.** Everyone has the right to know whether information concerning them is being processed. This information must be disclosed upon request and deleted or corrected if necessary. An example is the company Facebook. It is facing a major flood of access requests in regard to which data is being stored about users.
5. **Principle of nondiscrimination.** The principle of nondiscrimination regulates the processing of data which are likely to give rise to unlawful or arbitrary discrimination. This can be information about racial or ethnic origin, skin color, sexual orientation, political opinions, etc. Essentially this principle was implemented in order to avoid decisions being made in an arbitrary manner or based on individual preferences. Consider, for example, a couple applying for a daycare place for their small child in a municipality. In Germany, there is a massive shortage of capacity. This leads to a natural over-demand. The decision as to who will

receive the scarce place is made by a municipal public servant. It is a relatively easy exercise to imagine how this public servant could make the decision based on his/her own preferences and nonobjectively.

In regard to data privacy regulations there is a major difference between the different regions of the world. While the regulations on data privacy are pretty tight in the European Union, the United States of America have a very different practice in this. In the US, data privacy regulation began with the United States Privacy Act in 1974. The core difference between the US privacy concept and European concepts such as the German one is the scope of regulation. US legislation is far more flexible in terms of data privacy regulations regarding data collected by private businesses. The stricter data privacy regulations mainly focus on governmental institutions. Hence, individuals have to be aware of this when interacting with private businesses in the United States. A good overview of the differences between the data privacy regulations and their history is given by Bennett (1992). European law prohibits the transfer of personal data from a European member state to a state which does not obey data privacy laws equally as strict as the ones in the European Union. On the basis of this deficiency and in order to facilitate cross-Atlantic business transactions, in the years 1998 and 2000 a specific concept was developed by the US Department of Commerce in consultation with the European Union. The result was the “Safe Harbor” principles which define a list of criteria which a company can subscribe to fulfill. These criteria, which provide data protection equally as strong as in the European data protection directives, represent a voluntary self-control mechanism which companies can subscribe to in order to facilitate data exchange with European business partners. Companies subscribing include Microsoft, General Motors, Amazon.com, Google, Hewlett-Packard, and Facebook.

4.3.3 How Does One Technically Conceptualize Secure Data Transactions?

Technically the transfer of information between two computers, an end-user device (smartphone, computer, laptop etc.) and for example a server of a company or public institution takes place via electronic networks like the internet. It is not the purpose of this book to go into detail regarding the technical implementations of security. However, in order to facilitate an understanding of the concepts of encryption and secure communication over digital channels, the fundamentals of the technical layer are introduced.

The underlying concept of data transmissions via networks is specified in the OSI (Open Systems Interconnection) model. Its development started in 1979 and it became a standard in 1983. The OSI model differentiates seven layers of communication (cp. Table 4.1). It differentiates the protocol layers for communication protocols. Each device using modern network technology is implemented based on the principles of this protocol.

Table 4.1 The OSI model

	OSI layer	Function
7	Application	Network process to application
6	Presentation	Data representation, encryption and decryption, convert machine dependent data to machine independent data
5	Session	Inter-host communication
4	Transport	End-to-end connections and reliability, flow control
3	Network	Path determination and logical addressing
2	Data link	Physical addressing
1	Physical	Media, signal and binary transmission

Fundamental layers like 1–4 regulate the data transport. The security features are implemented in layer 5 (Session) and layer 6 (presentation). The Secure Sockets Layer (SSL) protocol is included in these two sessions (cp. Fig. 4.5). This protocol performs a handshake procedure when two new devices which have not had contact before interact. Then, data exchange between the devices is conducted using an encrypted channel.

Hence, there are two communication phases. First, a handshake phase takes place, then, a data transfer phase begins. In the handshake phase the server and optionally the client are authenticated. Afterwards, the cryptographic keys are established that will be used to protect the data to be transmitted in the data transfer phase. The encryption that was created during the handshake phase is used in this phase.

As shown in Fig. 4.5, the secure sockets layer protocol functions as follows:

1. The client sends a Hello message to the server including a list of algorithms supported by the client and a random number that will be used to generate the keys.
2. The server responds by sending a Hello message to the client. This message includes the algorithm to use. The server selected this from the list sent by the client. It also contains another random number which will be used to generate the keys.
3. The server sends its certificate to the client.
4. In the next step, the client authenticates the server using the server’s certificate.
5. The client now generates a random value (called ‘premaster secret’), encrypts it using the server’s public key, and sends it to the server.
6. The server uses its private key to decrypt the message to retrieve the premaster secret.
7. The client and server separately calculate the keys that will be used in the SSL session. These keys are not sent to each other because the keys are calculated based on the premaster secret and the random numbers which are known on both sides. These keys include:
 - An encryption key that the client uses to encrypt data before sending it to the server.
 - An encryption key that the server uses to encrypt data before sending it to the client.

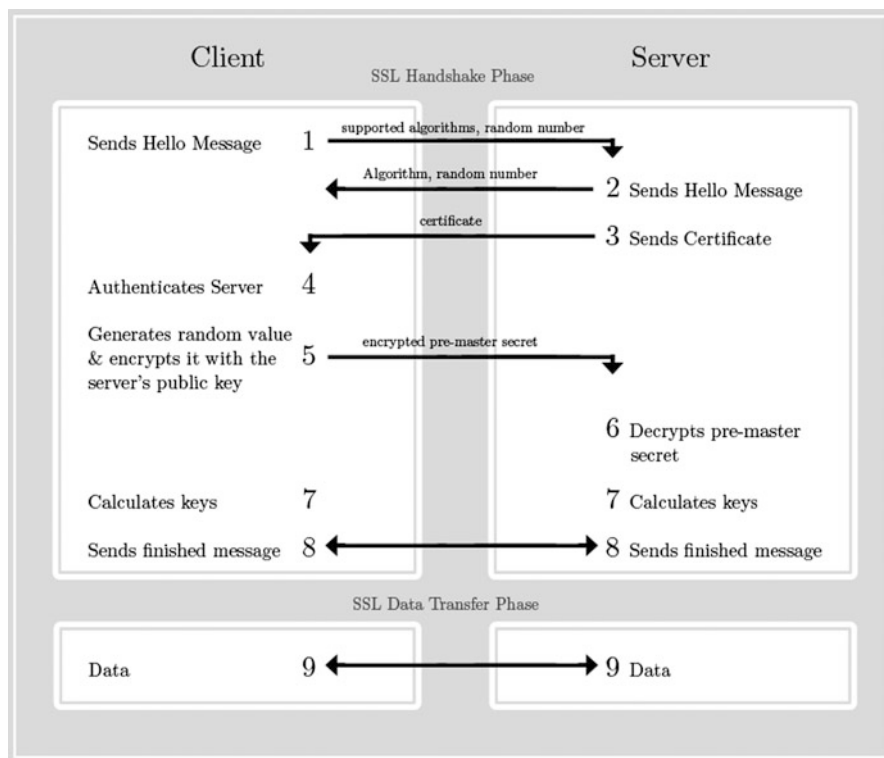


Fig. 4.5 The secure sockets layer protocol

- A key that the client uses to create a message digest of the data.
- A key that the server uses to create a message digest of the data.

The encryption keys are symmetric, that is, the same key is used to encrypt and decrypt the data.

8. The client and server send a Finished message to each other. These are the first messages that are sent using the keys generated in the previous step (the first 'secure' messages). The Finished message includes all the previous handshake messages that each side sent. Each side verifies that the previous messages that it received match the messages included in the Finished message. This checks that the handshake messages were not tampered with.
9. The client and server now transfer data using the encryption and hashing keys and algorithms.

The Secure Sockets Layer protocol is one out of a large number of encryption concepts for the data transfer layer. Today, it is the most frequently used protocol and you can find it in nearly every internet browser software program. Every time you see a little lock at the bottom of your browser window, it indicates that this procedure has been carried out in order to encrypt the transmission.

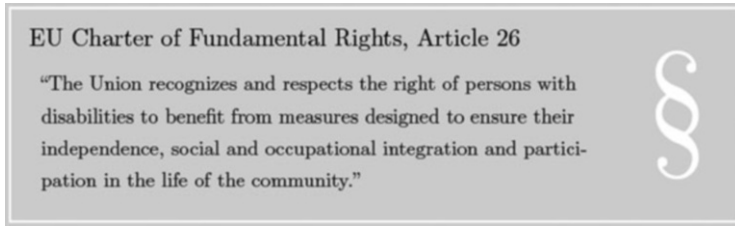


Fig. 4.6 EU charter of fundamental rights

The transmissions encrypted with the SSL protocol are of course safer than non-encrypted transmissions. However, it is of course not a guarantee of privacy. Intruders may copy the entire (encrypted) data traffic between two devices and use decrypting software to make the content accessible. Nevertheless, the encryption based on these protocols makes the interception of data transfers so difficult and time intensive that there is only a limited threat to everyday internet usage.

4.4 Equal Opportunities Principle

4.4.1 What Is the Effect of the Equal Opportunities Principle?

Article 26 of the EU Charter of Fundamental Rights regulates the equal opportunities principle for all citizens of the European Union. In this article it says that measures have to be designed in order to enable citizens with disabilities to be independent (cp. Fig. 4.6). In digital government management the concept of making services disability-friendly is called e-inclusion.

There are about 80 million people with disabilities living in the European Union. In Germany, the Act on Equal Opportunities for the Disabled (“Bundesgleichstellungsgesetz”) became operative in May 2002. In July 2002 the Ordinance on the Creation of Barrier-Free Information (“Barrierefreie Informationstechnik Verordnung”) (BITV for short) was enacted. This ordinance applies to all web sites of authorities of the federal administration. Standards and requirements are defined which are generally based on the web content accessibility guidelines of the W2C Web Accessibility Initiative (WAI). This initiative plays the role of developing guidelines and techniques that describe accessibility solutions for web software and web developers. WAI guidelines are considered the international standard for web accessibility.

For example, particular difficulties are experienced by people with color blindness. Therefore, text and images on web sites have to be made readable in terms of their color contrast. For this, there is a web accessibility guideline which defines that sufficient color contrast has to be used and that redundant information for color has to be avoided. It imposes the use of style sheets to control layout and the presentation of contents rather than allowing these decisions to be made by

individual units of administrations. It also suggests the preferred use of relative as opposed to absolute units in markup language attribute values and style sheet property values in order to enable users to scale their screen attributes individually.

Taking into consideration more severe disabilities like dyslexia or cognitive disability, several web accessibility guidelines have been suggested. For persons with dyslexia the problem is that digital content with animated graphics can hardly be perceived. Also, focusing is a major problem. Here the guidelines define principles to allow users to freeze graphics and scrolling texts. Persons with dyslexia also have difficulty in understanding complex concepts. They rely more on simple graphical descriptions to enhance the understanding of web content. In this case, the supplementation of text with graphic or auditory presentations is suggested where possible in order to facilitate comprehension of a page. If search functions are provided, the enabling of different types of searches for different skill levels and preferences is suggested. Also, homogenous styles should be used which are applied across pages. Navigation mechanisms should be consistently designed and the clearest and simplest language that is appropriate to the page's content should be used.

Chapter Summary

This chapter describes the legal basis of some of the most fundamental aspects of digital government management. Beginning with a short historical overview the problem of bridging the gap between regulation and technological implementation is highlighted. An overview is given of the core problem of e-government: confidential correspondence and storage of information between citizens, businesses, and governments. Some aspects such as digital signatures – one of the most fundamental technical concepts for implementing e-government – are introduced. Both their legal basis and mathematical principles are outlined. Furthermore, this chapter elaborates on the protection of personal data and the respective regulation in the European Union. This principle is contrasted with how data protection is regulated in the United States of America. Next, secure data transactions are introduced along with their conceptual technical solution. Finally, the inclusion of disabled citizens into digital government initiatives – e-inclusion – and its constitutional foundations are outlined.

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Abstract

The concept of online one-stop government is aimed at simplifying access to governmental services. It implies a strong adoption of interoperability standards or standards for process integration amongst public administrations so that they are able to share data and integrate activities while complying with data privacy standards. The aim of this chapter is to outline the most important aspects of integrating digital public services into one-stop portals with a single access platform, where citizens and businesses can access the services they require based on a life-events approach. Network externalities, prototypical theoretical concepts, and research on determinants of adoption are introduced and discussed.

Learning Objectives

- What is the vision of online public service delivery?
- What are the determinants of the paradigm shift in digital era governance?
- What is online one-stop government?
- How does integration of services work?
- What does the ‘life-event’ metaphor mean?
- How does the prototype “e-government service marketplace (eGovSM)” function?
- What does interoperability of e-government services mean?
- What is an interoperability framework for G2G data exchange?
- How can one increase the adoption of interoperability standards?

5.1 Introduction**5.1.1 What Is the Vision of Online Public Service Delivery?**

In modern states, public service delivery is changing drastically. One of the main drivers of this is the fact that a growing alienation between governments and their citizens is becoming visible. The risk of citizens becoming disaffected, skeptical, and cynical of governmental actions has led to a number of developments in public administrations and governments, which builds the basis for a new culture of joint initiatives aimed at integrating the needs and demands of citizens more explicitly. “This movement from a ‘they’ to a ‘we’ spirit is perhaps the most important mission of public administration in our era” states Vigoda (2002). This statement was made within the debate about New Public Management (NPM) as a next-generation form of public administration. The core idea of the NPM movement is the transition from hierarchical and slow-moving administrative bodies into interactive, responsive public administrations. In this sense, a role model is seen in private businesses and their service delivery models. “The customer is always right” is the underlying assumption of this view in a new, service-oriented vision for public administration. This service orientation and responsiveness as a paradigm for public administration refers to the speed and accuracy with which the wishes of citizens are fulfilled. Speed in this sense refers to the duration a citizen has to wait for a certain service to be delivered. The term accuracy paraphrases the extent to which the public administration body actually meets the citizen’s need in terms of the result of a citizen’s request. In order to meet these demands, Hays and Kearney (Hays and Kearney 1997) differentiate five core principles: (1) downsizing, that is reducing the size and scope of government; (2) managerialism, that is applying business protocols in governmental set-ups; (3) decentralization, that is locating decision making closer

to the service recipient; (4) debureaucratization, that is remodeling governments with a focus on results rather than processes; and (5) privatization, that is outsourcing governmental service delivery to outside firms.

Achieving these principles involves a permanent process of striving for quality improvement. Downsizing as a target is a common motive. The idea is to make the state slim and in principle govern as little as possible and as much as needed. This target cannot be reached directly but only through intermediate steps. The principle of managerialism is more directly applicable. Behind this idea stands the concept of adopting best practices from business and applying them to public sector management. In the remainder of this chapter, many aspects of best practice adoption will be introduced. The concept of decentralization is closely linked with the principle of subsidiarity in federal systems. The meaning of this principle is that each task should be executed by the lowest federal tier (e.g., municipality) possible. The opposite is the principle of solidarity, in which a higher federal tier (e.g., federal state) assumes control. Constitutionally, this principle is implemented in the sense that each lower federal tier is allowed to execute administrative procedures until stating that it is incapable of doing so, at which point they offer a transfer and delegation of the task to the next higher tier. In practice, however, after decades of upwards delegation, many tasks and administrative procedures are now regulated by higher tier federal units. This has led to a situation where lower tier federal units are very sensitive in regard to their own competencies and the protection of said competencies. Particularly in Germany, where ‘municipal self-governance’ is a constitutional right, there exists a strong reluctance in municipalities to upwards delegate their own competencies. This is a difficult topic particularly with respect to the deployment and choice of ICT solutions and gave rise to the highly scattered and heterogeneous ICT landscape visible in Germany today. In regard to the principle of debureaucratization, ICT has a major impact. It is not so much that rules or regulations are reduced, but more that many regulations can be made ‘intangible’ and ‘invisible’ by automatization using ICT. Hence, ICT carries with it the potential to reduce the extent to which bureaucracy is felt by individuals and businesses.

5.1.2 Outline of the Chapter

This chapter starts by outlining the principles of digital era governance. It continues by defining the concept of online one-stop government and then goes into detail on how service integration works. The central concept of dynamic service integration is tailored around the idea of the ‘life-event’ metaphor. On this basis a theoretical prototype for an e-government service marketplace (eGovSM) is introduced which is followed by an early real life example of an indexing portal attempting to put the concept into practice. Furthermore, the notion of interoperability is introduced followed by a framework for G2G interoperability standards. Finally, the chapter is concluded with an overview on network effect theory. An outlook is given on the determinants influencing the propensity of adoption or nonadoption of public sector interoperability standards.

5.2 Digital Era Governance

5.2.1 What Are the Determinants of the Paradigm Shift in Digital Era Governance?

On the basis of the tensions introduced by the process of renewal of public administrations with respect to citizen-oriented service delivery, there are a number of aspects that accompany the paradigm shift in the thinking of public administrative officials. First and foremost, digital era governance is dominated by the hypothesis of a needs-based holism. This concept refers to the adoption of holistic and needs-orientated structures in public sector administrations. Along with this, the consequent questioning of existing structures must be addressed. When moving from a traditional service delivery concept towards a digital version, it is not enough to simply transfer all of the procedures to an ICT-enabled solution. On the contrary, every step has to be questioned and process optimization has to be carried out with respect to the digitization. Hence, most of the potential for optimization of processes in the public sector – as in private enterprises – is only partially enabled by the efficiency potential of ICT itself. Large parts are enabled by critically questioning the status quo and reducing complexity before digitizing the process.

5.2.2 What Is Online One-Stop Government?

Modernizing public service delivery in terms of optimization and citizen-centricity leads to a concept that is called ‘online one-stop government.’ This term refers to creating a virtual office – like a physical citizen’s office – which enables users to identify their own needs and receive complex and intertwined services all in one place. Traditionally, services were received in a way that was far from integrated. In the old version of public administration, citizens were treated as subjects, and leaders and administrators held almost absolute power and control over the people (Vigoda 2002). This led to a vertical orientation where administrations were usually optimized in terms of the functioning of the institution rather than in terms of service quality and speed. This is radically different in one-stop concepts. Wimmer and Tambouris define online one-stop government as follows: “One-stop government refers to the integration of public services from a citizen’s – or customer of public services – point of view. This implies that public services are accessible through a single window even if they are provided by different public authorities or private service providers.” (Wimmer and Tambouris 2002). They imply that two general preconditions have to be met: public services must be integrated and citizens must be able to access these services in a well understandable manner which meets the needs and perspectives of the citizen.

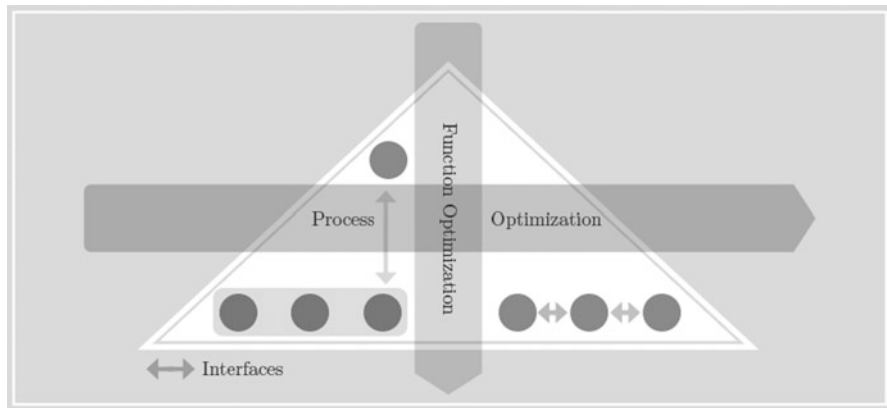


Fig. 5.1 Function orientation in modern administrations

5.2.3 How Does Integration of Services Work?

Traditionally, organizations grow and have been constructed in a function-oriented way (cp. Fig. 5.1). This brings with it the advantage of optimizing along reporting lines and creating an enterprise that functions well within the individual hierarchical lines. However, it also implies major disadvantages, which stand in the way of optimization along process lines. Usually, processes traverse across the organizational structure. Imagine, for example, the request of a Spanish hairdresser wishing to settle in a German municipality. This person will first have to apply to receive a license to exercise his/her occupation. Next, a special license may be necessary in order to be allowed to handle dangerous liquids. Further special allowances may be necessary such as, for example, health office certificates, tax registration, and many more. Finally, the person will have to apply at a large number of different authorities in order to receive all necessary allowances to exercise his/her business. If we transfer this concrete process to a one-stop setup, the person would apply at exactly one physical or virtual counter. At that location, all necessary information and (digital) copies of certificates will be collected. The coordination between the different authorities may take place in a manner that is invisible to the person involved. And an overarching allowance, including all suballowances will be issued at the end of the application procedure. If the entire process is carried out on a digital platform, this represents the general idea of online one-stop government.

In order to integrate these services, many individual steps are necessary. First, all units and involved authorities have to use services that support interoperability. Second, life events have to be defined, that is typical situations citizens might find themselves in which require an aggregated set of services in order to be resolved.

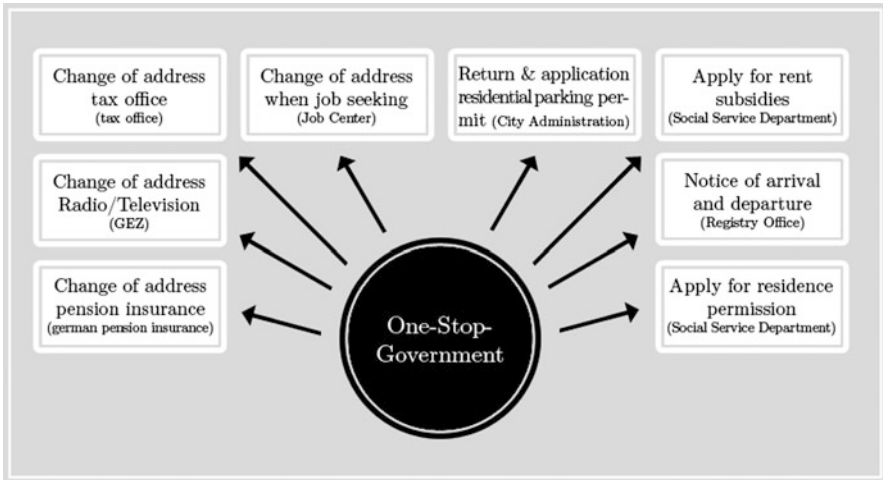


Fig. 5.2 The life-event metaphor

5.2.4 What Does the Life-Event Metaphor Mean?

Integrating public services from a citizens' or business' point of view requires the definition of typical situations, which occur in real life. Certainly not all life-events may be defined in such a way. However, the vast majority of citizen and business requests to public authorities fall into a quite small number of categories.

The life-event metaphor characterizes typical situations citizens or businesses may find themselves in (cp. Fig. 5.2). The figure shows the case of a citizen that has moved from municipality A to municipality B. Typically, a large number of changes have to be made. The citizen has to register his place of residence, register for radio and television fees, change the address held by the pension fund agency, apply for an area parking permit, children have to be registered at the school and/or kindergarten, cars have to be registered with new plates and if applicable, the social department has to be informed regarding rent subsidies or social welfare etc. Traditionally, each of these services was stand-alone. Hence, the citizen had to register individually with each of these services but was not able to aggregate this service. In an ideal future service-oriented public administration, the citizen will log on to his/her account online and invoke the procedure 'move main residency.' Then, the system will guide the user through all steps necessary in order to fulfill the changes in registration and formal procedures. However, today's administrations are far from this ideal. The main reason is the lack of integration of different systems. Of course, data privacy and informational division of power (cp. Chaps. 1 and 4) have to be respected. Nevertheless, if citizens accept by explicitly agreeing online to the relevant information being shared between the different authorities, integration is legally possible. The vision of this integration is the final step in most common e-government maturity models: Online one-stop government.

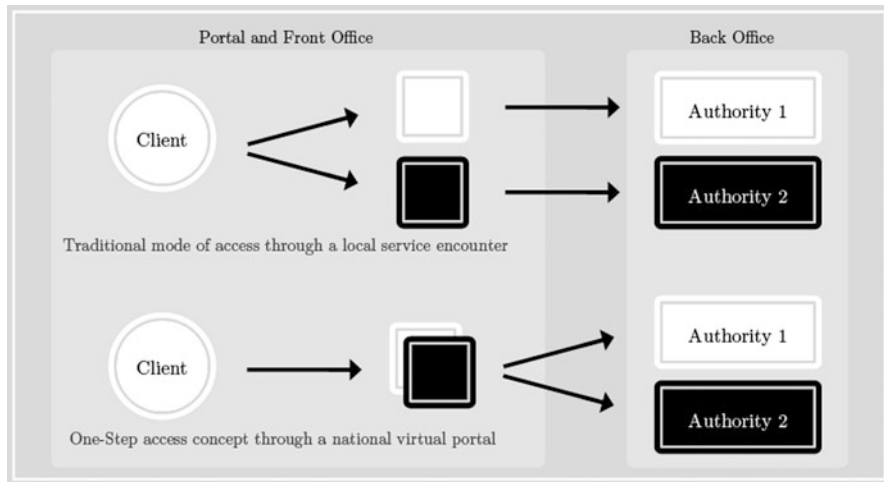


Fig. 5.3 Integration of services into one-stop government (Based on Wimmer and Tambouris 2002)

Figure 5.3 shows the underlying idea of one-stop government portals. Moving governmental institutions ‘behind the curtain’ implies two major aspects. First, a legal and technical integration must be made possible. One of the main drivers of this is the horizontal integration of different domains of the body of law through a specific e-government law (cp. Chap. 4). From the technical perspective, a main driver is the enforcement of data exchange standards and the implementation of those using new institutions like national IT planning councils, as has been introduced in Germany based on the new Article 91c in the Constitution. A stronger adoption of data exchange standards leads to increased possibilities for seamlessly integrating services.

Process integration is the major key to success in reaching the vision of online one-stop government. Figure 5.4 shows the process integration beginning with life events or business situations. Each of these events consists of a number of public services, which have to be invoked. These public services consist of certain processes each of which have process steps and primary services they rely upon. Parallel to this is the portal – the external storefront that is visible to the citizen or business. Next, there is a front-office which relies on a back-office. The public services and processes have to be mapped to the respective offices in order to make them processable. Then, the back-office begins with invoking the procedures, which then aggregate to an over-all public service to be delivered in the front-office again. Since this is a very interface-rich procedure, there are many points at which errors may occur. These have to be assessed and analyzed carefully and then overcome in order to create robust, reliable, and accepted public services.

Ideally, the physical one-stop citizen offices and the online one-stop government websites both operate on the same system. This would allow both, a continuance of the delivery of the classical service format in a real-world one-stop shop; and

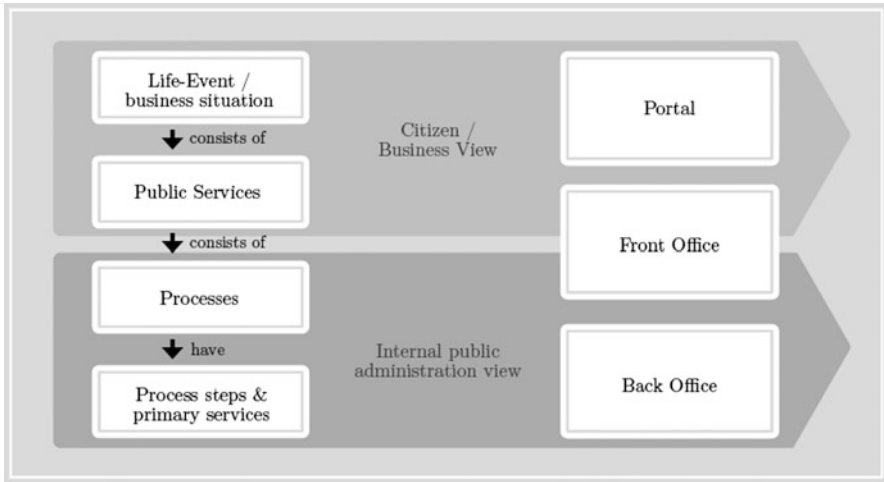


Fig. 5.4 Process integration in one-stop government (Based on Wimmer and Tambouris 2002)

additionally, an online version for the citizens and businesses who wish to use it. Also a transition between face-to-face service delivery and online service delivery is facilitated in this way as citizens may use the online platform up to the point at which they no longer understand it and then visit the real-world citizen office to complete the service continuing from exactly the same point at which they gave up on their own computer. A learning and trust-building process starts in this way so that the respective citizen may next time have the confidence to continue and complete the service online at home.

Ultimately, of course, the digitization of processes can be enforced by law. This is seen in some regulations, for example in German tax law. One of the first examples of this was the regular submission of VAT statements to the financial offices by self-employed citizens and businesses. Here, the government decided to enforce digital information delivery by law and to only allow exceptions based on a formal application.

The main challenge when integrating heterogeneous administrative services into a one-stop portal is the implementation of the technical and content interoperability.

5.2.5 How Does the Prototype “E-Government Service Marketplace (eGovSM)” Function?

We are going to introduce the prototype of the e-government service marketplace (eGovSM) as it is a very good example of how one-stop government concepts can be implemented (Mugellini et al. 2005). The underlying idea of the eGovSM is to provide governmental institutions and individual administrative bodies with the maximum degree of freedom and autonomy and yet offer citizens and businesses a

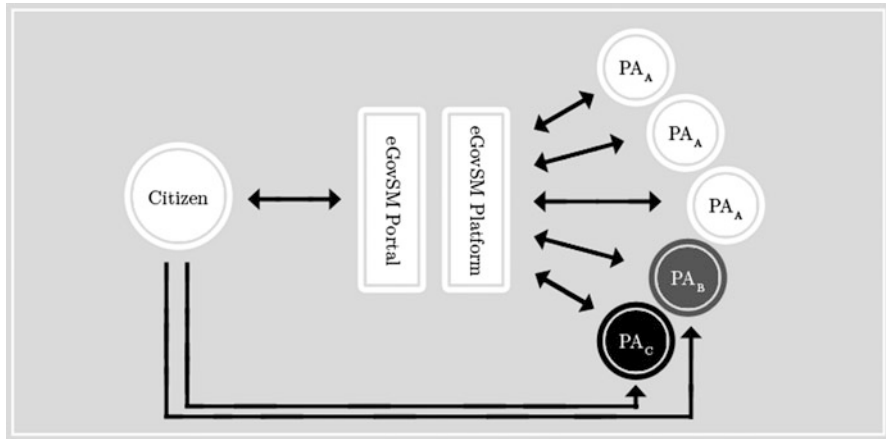


Fig. 5.5 eGovernment service marketplace

unique interface in the form of a one-stop government shop. Hence, it provides citizen-oriented services, that is supporting citizens with services every time they need them, wherever they are, and in a personalized way. The nature of the eGovSM respects the autonomy of single administrations or regional entities by not obliging each single administration to deploy an instance of the proposed architecture. At the same time, it provides a single access point to government services via the web. Consequently, the necessary operations for collecting the information to deliver government services are conducted by the service rather than the citizen.

The advantages of this concept are twofold. First, the marketplace provides services according to citizens' needs using the life-event metaphor introduced earlier. Thereby, citizens' are unable to perceive the complexity of the administrative processes and this contributes to a subjective debureaucratization as proposed in the introduction of this chapter. Second, it integrates public administration legacy systems allowing public administration subscriptions to the marketplace according to four different interoperability levels (including nondigital data provision).

Citizens and businesses access the marketplace in order to share data and receive service delivery. Public administrations (PAs) subscribe to the eGovSM in order to share data and provide services. Three different public administrations are differentiated (cp. Fig. 5.5).

- Public administrations of type A: represent administrations subscribed to the eGovSM that automatically provide data to the marketplace without requiring the citizen to interact.
- Public administrations of type B: represent administrations subscribed to the eGovSM that can automatically provide data to the SM, but require direct interaction with the citizen.
- Public administrations of type C: represent administrations that are not subscribed to the eGovSM and hence need direct interaction with the citizens to provide data.

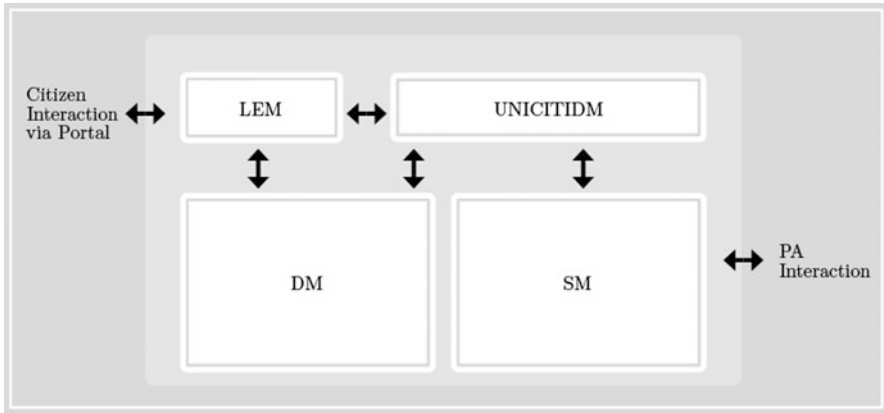


Fig. 5.6 eGovSM architecture

Figure 5.6 shows the architecture of the eGovSM. Its core is the UNICITDM (UNiversal CITizen Identifier Manager). It is an URN-like structure (Uniform Resource Name), which provides an individual identification number for each citizen. An example is the following string:

it:rossi.luca:1960-04-08:it.toscana.firenze:codicefiscale

This string consists of identifiers separated by a colon. Here, the country, name, birthdate, birthplace, and country-specific information are combined. A debate is ongoing in different countries in Europe as to whether unique personal identification numbers are in line with the right of informational self-determination as introduced in Chap. 4. In Germany, in 2007 a unique identifier for each citizen paying tax was introduced (tax identification number). Similarly, in Italy, the *codicefiscale* has been established. However, there remains doubt as to whether this procedure is in line with the constitutional rights of individuals to determine which authority holds which information about individuals. A general fear that authorities may store information beyond pure tax data has led to a number of ongoing initiatives in Germany opposing the establishment of the tax identification number.

Since a unique identification number, however, is a core component for the establishment of a seamless online service, these initiatives do hamper the speed of digitization in public sector administrations. In any case, constitutional concerns must have priority over efficiency. We will continue this debate in more depth in the Chap. 9 E-Participation.

Assuming in the following that a UNICITDM is in place, the further components of the core architecture of the eGovSM are the LEM, DM, and the SM. The LEM (Life-Event Manager) represents the life-event manager. This unit provides a list of life events from which citizens can choose when logging onto the platform. The life events then point to the DM (Document Manager) which is the document manager of the platform. In its database the DM contains all relevant documents of the

authority regarding citizens. The SM (Service Manager) is the service manager of the platform. The LEM manages all interactions of a citizen with the marketplace. It is responsible for creating, publishing, and updating life-event lists in order to provide up-to date personalized lists of available options. Citizen authentication is also located in this unit. After selection of a specific life event the LEM correlates the requested service with the corresponding administrative process by creating a process descriptor. Additionally a document descriptor is added in order to provide the structure of the official document (i.e., the data it contains, the associated constraints, and aggregation of rules for the final document). This information is stored in an associated life-event database.

The Document Manager (DM) is the component responsible for the administrative process execution. It manages all operations necessary to collect the required data and to deliver documents to the requesting citizen. For this, it uses the process descriptor and document descriptor assigned by the LEM. Its activity is subdivided into two phases: the verification of the fulfillment of prerequisites associated with the service and the coordination of all the operations to retrieve the necessary data. There is a repository in the form of a database in which all information regarding the process execution status is registered. The most interesting concept in the eGovSM is the underlying idea of the Service Manager (SM). It is the unit which coordinates and manages the interactions between the marketplace and the PAs. The fundamental idea is to provide the citizen with a one-stop front-end. Hence, a homogenization of the heterogeneous information systems is necessary. In this, the SM functions as a gateway between citizens and PAs and also between different PAs. It allows for four different subscription profiles:

- Profile 0: refers to PAs that are not able to provide electronic data.
- Profile 1: refers to PAs that can provide elementary electronic functionalities.
- Profile 2: refers to PAs that are able to provide a richer set of functionalities.
- Profile 3: refers to PAs that deploy instances of the eGovSM platform.

Thereby, it is of particular interest that the concept of the eGovSM allows for an interaction between PAs that provide no digital data interfaces at all. Therefore, it allows for an integration of all kinds of different public administrations and homogenizes the maturity level in the perception of the citizens. It thereby differentiates between the different technical abilities of concrete administrations and provides a “positive” selection along the quality of service. It allows legacy applications and nontechnical administrations to also participate (profile 0 and 1). The downside of the eGovSM concept is an oversimplification of the complexity of real-world applications in the technical, organizational, and political sense. However, the theoretical approach is very promising and underlies the architectural considerations of many real-world scenarios.

Box 5.1. Best Practice: Service-bw: The Online Service of the Federal State of Baden-Wuerttemberg

Service Baden-Wuerttemberg (<http://www.service-bw.de/>) is an indexing portal for all administration services and information that local, state, and federal governments provide for citizens and enterprises. It is implemented in a multilingual way (German, English, and French) and provides help in all aspects of the daily life of a citizen, including procedures, forms and online services, addresses, telephone numbers and opening hours of public administrations, public invitations to tender for business opportunities in e-procurement, a document safe, and the concepts of e-participation. For example in the field of business start-ups it provides basic information on planning, financing, location selection, financial assistance, as well as information regarding industry regions. In the field of citizen service it, for example, provides procedures allowing citizens to register their residency in another municipality. Basic information regarding the procedures, responsible authority, as well as a link to download the respective forms and online services of the responsible authority (if applicable) based on the zip code of the municipality are available. It contains all addresses, telephone numbers, opening hours, and web addresses of public authorities in the state of Baden-Wuerttemberg.

Another service called “my service-bw” includes a document safe allowing one to store personal data and official documents – for example certificates – securely and in an encrypted way. It includes a function to forward certificates and personal data online in a legally binding and secure way. Thereby, personal data can be transferred to online services if this is necessary to process the relevant administrative services of the responsible authority via the internet. Furthermore, the document safe can also store personal certificates making them available and useable by the citizen from any location. In order to ensure security, three modes of registration are possible. The new digital citizen ID card in Germany allows for digital identification on the internet and can be used in order to identify oneself for the document safe. Another possibility is the employment of a specific digital signature card (see Chap. 4). A username/password combination also allows access. In 2012, service-bw still only represents an indexing portal and not a fully integrated one-stop government platform. Therefore, most services remain of informational nature. Although some services allow for digital transactions, the platform is still far from being an integrated transformational one-stop portal.

5.2.6 What Does Interoperability of E-Government Services Mean?

Interoperability of digital services is both, a prerequisite for and a facilitator of efficient public service delivery. Interoperability addresses the need for cooperation between public administrations aiming at the establishment of digital public

services. It focuses on exchanging information between public administrations to fulfill legal requirements or political commitments. Its main focus is on sharing and reusing information among public administrations in order to decrease the administrative burden on citizens and businesses. Furthermore, interoperability is the main driver for the last step in the maturity model of e-government services, the transition from transaction-based services to one-stop government platforms. In this sense, the European Commission defines this concept as follows:

Interoperability [...] is the ability of disparate and diverse organizations to interact towards mutually beneficial and agreed common goals, involving the sharing of information and knowledge between the organizations, through the business processes they support, by means of the exchange of data between their respective ICT systems. (European Commission 2010)

If public services are designed in an interoperable way, they provide an improved public service delivery to citizens and businesses by facilitating the one-stop shop delivery of public services. Beyond this, it facilitates significant cost reductions for public administrations, businesses, and citizens due to the efficient delivery of public services.

An interoperability framework is an agreed approach to interoperability for organizations that wish to work together towards the joint delivery of public services. Within its scope of applicability, it specifies a set of common elements such as vocabulary, concepts, principles, policies, guidelines, recommendations, standards, specifications and practices. (European Commission 2010)

This view of an interoperable e-government framework suggests common agreements between different federal levels – including the European member state level – on standards in the provisioning of services and processing of digital data. The concept of the European Union includes both, suggestions for G2C and G2B as well as G2G interactions. It is partially founded on the web accessibility guidelines and makes use of adoption of digital ID cards such as the new digital ID card (dt. neuer Personalausweis) in Germany. In order to process data in a legally binding way, digital signatures are necessary. These are standardized and also regulated by European directives (see Chap. 4). Several pan-European initiatives have been launched in the past years. Examples of these are Secure idenTity acrOss boRders linKed (STORK), Pan-European Public Procurement Online (PEPPOL), and Simple Procedures Online for Cross-Border Services (SPOCS). The underlying principle of these concepts is to enable businesses and citizens all over Europe to access and communicate with public bodies in admission processes, employment situations, public tender bidding, or for the registering of a business abroad (cp. Fig. 5.7).

In Germany, the interoperability is regulated in the new amendment to the Constitution – article 91c (see Chap. 4). This article contains the following:

[...] (2) The Federation and the Länder may agree to specify the standards and security requirements necessary for exchanges between their information technology systems.[...]

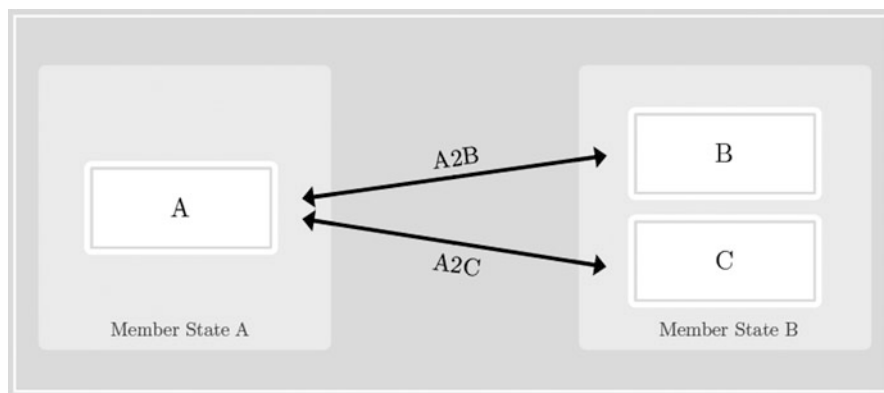


Fig. 5.7 Cross-border communication between public sector, businesses, and citizens

In addition, in April 2010 a new element of governance was created which is in charge of coordinating the standardization process amongst German public administrations in order to facilitate interoperability; this is called the German IT-planning council (dt. IT-Planungsrat). This council was founded based on a contract amongst the federal states (dt. IT-Staatsvertrag). This contract regulates the foundation of the IT-planning council and IT cooperation between the state and federal government.

On the basis of the decisions of the IT-planning council, a coordinating unit for IT-standards (dt. Kosit: Koordinierungsstelle für IT-Standards) has been created. It is operated by the Free Hanseatic city of Bremen. The main task of this unit is to develop IT interoperability and IT security standards. It is fully subordinated to the IT-planning council and began operating in April 2011.

5.2.7 What Is an Interoperability Framework for G2G Data Exchange?

Interoperability starts with standardization initiatives and lives by the adoption of such initiatives by public administrations. In federal systems there are a number of difficulties in this adoption process. Generally, as discussed in Chap. 4, the municipal right of self-governance allows each municipality and other public bodies to decide many issues themselves. Amongst others, they have for many years been allowed to define their own IT infrastructures and implement them or procure them through an implementation partner. On the basis of the new rules and the interoperability constraints placed on governmental institutions through the new constitutional and European rulings, interoperability has been enforced and self-governance of IT infrastructures reduced. This is in parallel to the growing maturity of IT platforms as such. In the German federal structure, interoperability standards have been defined in the XÖV standards (dt. XML in der öffentlichen Verwaltung).

The XÖV standards are a family of data structure standards which are based on the markup language XML (cp. <http://www.w3c.org/XML/>). XML or eXtensible Markup Language is a meta language in which concrete document formats may be defined. In the XÖV standard family, examples of standards that have been defined include XBau (construction domain), XKfz (vehicle registry), XMeld (residency registry), and XPersonenstand (civil status of a person). These standard specifications can then be used and applied to exchange data between different public and also private institutions and administrations.

5.2.8 How Can One Increase the Adoption of Interoperability Standards?

Interoperability only becomes a paradigm-changing concept if it receives a significant level of adoption by the interacting participants. In the case of public administrations it has been outlined in the last two chapters of this book that many factors hamper the adoption of joint interoperability standards. Hence, the last step of the maturity model of e-government services – that is the transformational step – can only be taken if this resistance to adoption is closely looked at and the hurdles to adoption are reduced. In principle, public sector leaders have two possible general strategies to enable adoption of standardization. The first strategy is to strive for the integration of information handled by the authorities. This strategy results in an adoption of jointly defined data exchange standards. The second strategy is a process-based strategy aiming at the development of standard interfaces to access processes that are run at a distant authority.

Of course, in the public sector, legal regulations are the foremost enabler of standard adoption. As soon as a legal regulation for the adoption of standards is agreed upon, in principle the adoption question is solved. However, especially in federally organized democratic countries and structures, there are conflicting interests; these include for example the municipal right of self-governance and other principles of subsidiarity in federal structures that lead to a chronic under-adoption of standards. Hence, voluntary adoption decisions play a major role in making public administration interactions efficient. In this regard, from a theoretical point of view, two main streams of literature are important to understand the phenomenon of standardization decisions in large organizational set-ups. One is the perspective of network effect theory (also called the theory of network externalities), while the other is the empirical induction of exchange standards – that is exchange standard adoption models.

5.2.9 What Are Network Externalities?

Network externalities arise when one market participant affects others without a compensation being paid (Shapiro and Varian 1999). The underlying idea is an economic effect, which changes the perceived value of a good or service for all

potential users based on its market coverage. An example for an indirect positive network externality is the pollination of crops by bees. Bees are kept by the beekeeper for the honey, whilst pollination is a side effect which is positive but not intended. An example for direct positive network effects is the usage of certain compatible technologies; for example the value of fax machines has increased over the years with the rising number of participants in a professional network owning a fax machine. Examples of such network effects occur in physical networks, for example internet, phone, railway networks, etc. as well as in virtual networks, for example MS Office users, DVD users, Blu-ray users, users of fax machines, etc.

Therefore, consumers' preferences are said to exhibit network externalities if the utility of each consumer increases with an increase in the total number of consumers purchasing the same or a compatible brand. An increase in expected sales of network services consequently creates positive expected benefits for every consumer of the good. To differentiate this further, there are two types of network externalities: Direct network externalities are exhibited by a good or service whose adoption by different users is complementary, so that each user's adoption pays off and his/her incentive to adopt increases as other users adopt. Examples are the usage density of e-mail or telecommunication networks. In markets exposing direct network externalities Metcalfe's law (rule of thumb) applies. Assumption: The value of the network is proportional to the number of users. Assume n users. The value of the network is $n * (n-1) = n^2 - n$. Example: Value of a network to a single user is 1€ for each other user which is a member of the same network. Consequently, the value of a network of size 10 is 90€, of size 100 is 9,900€. A tenfold increase of the network size hence leads roughly to a 100-fold increase in its value (Klemperer and Farrell 2007).

Indirect network externalities arise through improved opportunities to trade with the other side of a market. Although buyers typically dislike being joined by other buyers because it raises the price given the number of sellers, they also like it because it attracts more sellers. An example is the choice of operating system on a computer (e.g., Microsoft Windows, Linux, Mac OS). Assumption: Most software packages are designed for a specific operating system. There is a positive correlation between the variety of software packages for a specific operating system and the number of users of the system. An extra user of an operating system indirectly affects the other users by raising the demand for complementary products (software packages). Similarly, the Blu-ray player adoption rate and the demand for Blu-ray discs can be taken as an example.

Consequently, a critical mass must be reached in order to achieve network externalities.

Critical mass (cp. Fig. 5.8) is defined as the minimal nonzero equilibrium size of a network good or service. The critical mass is of significant size for goods or services exhibiting strong network externalities. Hence, it formalizes the "chicken and the egg paradox." Many users are not interested in purchasing or adopting the good or service because the network is not of significant size or not perceived to be of significant size. Conversely, the network is not of significant size, because an insufficiently small number of users have adopted the good or service.

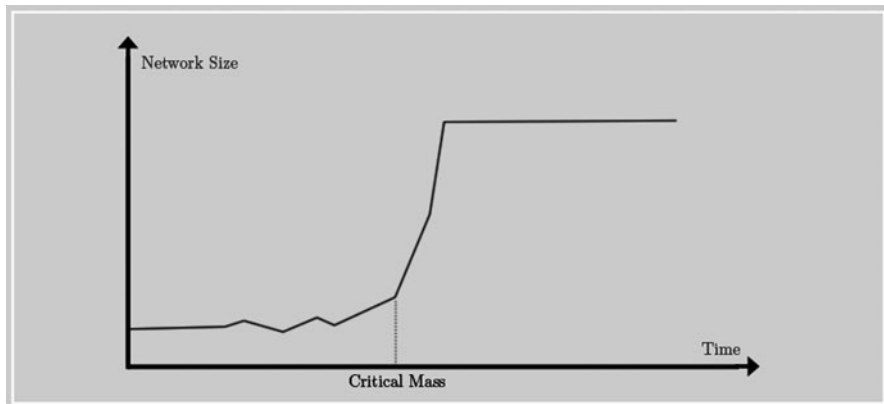


Fig. 5.8 Network externalities and critical mass

Consequently, there are a number of determinants of success for markets that exhibit network externalities. One is the first-mover advantage. Quite often, technologies or concepts apply as de facto standards because they were the first ones available to solve a problem at hand. Second, consumer expectations determine the success of networks. A network that looks like it is succeeding will as a result do so (bandwagon effect). Marketing consumer expectations is critical in markets exhibiting network externalities.

Other determinants of success are a superior technology, standardization (legislative authority, standardization organizations, etc.) and strategic alliances with producers of complementary goods.

In any case, as soon as an adoption of goods or services exhibiting network externalities took place, lock-in effects and switching costs occur. These effects especially heavily influence the agility of large organizations like public administrations or governmental units. Therefore, a thoughtful adoption of standards and services exhibiting network externalities seems wise. For further discussion of the implications of lock-in effects and switching costs the reader is referred to Shapiro and Varian (1999).

5.2.10 What Are the Determinants of Adoption in the Public Sector?

As a conclusion to the above written, the adoption of data exchange standards is consequently deemed beneficial for the increase of the interoperability of public administration services. Figure 5.9 shows the main factors influencing the adoption of public sector data exchange standards (Parasie 2011).

These factors have been identified based on in depth interviews with a large number of public sector leaders who decide on the adoption of these standards. External pressure, which is influenced by the pressure exercised by other public institutions, pressure from industry and business partners and legal regulations is

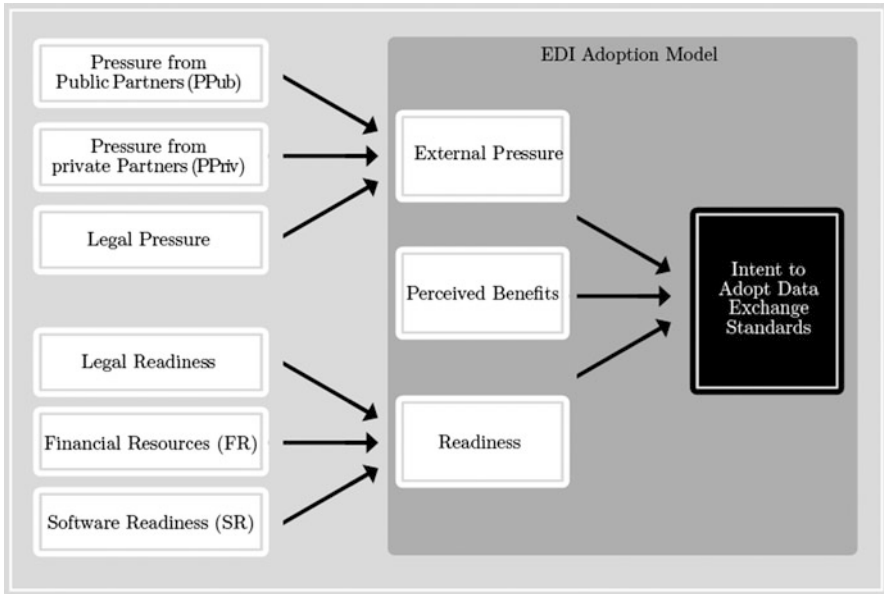


Fig. 5.9 Determinants of adoption of data exchange standards

one factor. Perceived benefits are another factor describing the different aspects that improve while adopting standards. Readiness is the third major factor influencing the propensity to adopt data exchange standards. The degree of readiness is mainly composed from legal readiness, that is the breaking down of federal and state regulations into own administrative rules, financial resources, that is does the unit have the financial resources to implement the standards, and lastly software readiness, in other words is there software available that implements the standards or do the respective vendors offer standard adopting solutions.

This topic is very important and determines the success or failure of interoperable information systems in the public sector. For a detailed analysis we refer the reader to the book by Parasie (2011)

Chapter Summary

This chapter outlines the concept of online one-stop government and the principle factors behind achieving modern, integrated, and transitional governmental services. Effects influencing this are the adoption rate of interoperability standards by different levels of autonomous public institutions, the possible financial savings based on digitization, the increase of efficiency and effectiveness by network externalities, as well as the integration of public administrations of different maturity status. Today's landscape in public ICT is highly heterogeneous, which is a result of the bottom-up growth and

(continued)

Chapter Summary (continued)

adoption of scattered and incompatible IT solutions around the European Union and within individual member states. Today in Germany alone, over 20,000 individual public administrations use over 400 different IT applications each. The normative suggestion from this is a stronger enforcement of standardization as is carried out for example by constitutional amendments and IT-planning councils of larger regions fostering IT homogenization and standardization.

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Abstract

While e-government during its early days was primarily concerned with improving the efficiency and effectiveness of government service provisioning, the advent of social media has opened up unexpected new opportunities of engaging the public in government work. Within this chapter, we discuss the opportunities and challenges of Open Government. Thereby, we analyze why and how governments should use open data and citizen-sourcing strategies to improve both the support and operational capacities of governments.

Learning Objectives

Introduction

- Who are the political pioneers of Open Government?
- What are the shortcomings of the online one-stop government paradigm?
- Is secrecy in government possible anyway?

Transparency

- Why should administrations publish their data?
- What are the challenges of implementing open data?

Participation and Collaboration

- What is the purpose of citizen-sourcing?
- What are the means to collect the wisdom of the crowd?
- What are the challenges of open participation and collaboration?

Evaluating Open Government Initiatives

- Why transparency might be better than secrecy?
- How Open Government can be used strategically if not opportunistically?

6.1 Introduction

6.1.1 Who Are the Political Pioneers of Open Government?

US President Obama can be seen as one of the political pioneers of Open Government. In 2009 on his first full day in office, he issued a memorandum on Transparency and Open Government.

My Administration is committed to creating an unprecedented level of openness in Government. We will work together to ensure the public trust and establish a system of transparency, public participation, and collaboration. Openness will strengthen our democracy and promote efficiency and effectiveness in Government. (The White House 2009)

Barack Obama's intention was to utilize the great opportunities of ICT and counter the public perception that the government operates in obscurity, if not secrecy. One of the basic ideas of Open Government is to establish a system of transparency within the public administration by giving people access to government information for effective public oversight.

Open Government is built upon three main principles. First, government should be transparent. By providing information about what the public administration is doing, citizens can hold government accountable for their actions. In order to ensure transparency, many countries have passed freedom of information legislation which governs public access to data held by governments. For example, the Aarhus convention – signed by the European Union and most member states – grants the public rights regarding access to information on matters concerning the local, national, and transboundary environment. Second, government should

be participatory. Knowledge is widely dispersed in society, and public officials benefit from having access to that dispersed knowledge. Thus, a participatory government may enhance its effectiveness and improve the quality of its decisions. Last but not least, government should be collaborative. Government should actively utilize the “wisdom of the crowd” by engaging citizens in the work of government. Moreover, public administrations should utilize tools that enable them to cooperate among themselves, and identify new opportunities for cooperation with nonprofit organizations and businesses.

6.1.2 What Are the Shortcomings of the Online One-Stop Government Paradigm?

The online one-stop government paradigm (see Chap. 5 Online One-Stop Government) represents an information and service provision model that has several practical shortcomings. On the one hand, typically only limited information is made available and if available, the data is not updated frequently. On the other hand, there is no or little interactive capability on government websites let alone transactional capability. As a consequence, government websites are not frequently visited by the public and there is no or little public engagement. The key idea of Open Government is to provide government data for effective public oversight and utilize social media technologies such as wikis, blogs, social networking, or social voting to socialize and complement digital public service delivery. Social media technologies allow users to create and share user-generated content. By engaging the public, governments can benefit from the skills and ideas of citizens and increase legitimacy and support for the public administration.

6.1.3 Is Secrecy in Government Possible Anyway?

In its broadest construction Open Government opposes national interests and other considerations, which have tended to legitimize extensive state secrecy. Critics of state secrecy argue that too much of government is secret and that secrecy is used by politicians to retain government power. Recent phenomena such as Wikileaks – an organization publishing classified media from anonymous news sources and whistleblowers (see Box 6.1) – show that the widespread use of ICT in government make it harder for government to keep information secret. In fact, the lesson of Wikileaks might have made power holders aware that no secret is safe and the act of publishing information openly may be less fearsome than thought and that the only efficient defense against leaks is transparency. In this vein, nongovernment organizations such as Transparency International or the Open Society Institute advocate that civil society, rather than legislation, provides the best way to control the policy enforcement activities of governments. Transparent by default and open access to documents and proceedings of the government are key claims of these initiatives.

Box 6.1 Wikileaks

Wikileaks is a nonprofit organization, which provides a secure and anonymous platform for sources to publish secret information, classified media, and news leaks. Its defined mission is to release original source material so “readers and historians alike can see the evidence of truth.” Wikileaks therefore is based on the defense of freedom of speech and media publishing and the support of the rights of all people. The organization itself is largely supported by volunteers and dependent on public donations.

So far, the group has released a number of significant documents that hit the headlines. In April 2010, the group published a video showing two Reuters journalists being fired at during a Baghdad airstrike in 2007. The pilots had erroneously identified the cameras carried by the journalists as weapons. In July 2010, a collection of 92,000 internal U.S. military logs related to the war in Afghanistan – most of them classified as secret – was made public by Wikileaks. Most of them deal with cases of friendly fire and civilian casualties during the period between January 2004 and December 2009.

In November 2010, Wikileaks released classified diplomatic cables, which had been sent to the U.S. State Department by its embassies, consulates, and diplomatic outposts around the world. Over 130,000 of the cables are unclassified, approximately 100,000 are labeled confidential, and about 15,000 have a higher security classification. Major print media worldwide cooperated with Wikileaks and reported exclusively.

Since its inception, the work of Wikileaks has been discussed controversially. Supporters commended Wikileaks for increasing transparency and democracy, supporting freedom of the press and enhancing democracy. State officials criticized Wikileaks for harming and compromising national security.

6.1.4 Outline of This Chapter

Just recently, Lee and Kwak (2012) published an Open Government maturity model developed to evaluate and guide Open Government initiatives enabled by emerging technologies such as social media. We take a simplified version of the model to structure this chapter (cf. Fig. 6.1). We already briefly discussed the drawbacks of most government websites (rarely visited, data is not updated frequently). In the next section, we discuss the opportunities and challenges of making government data accessible to the public from an economic and democratic perspective which represents the second stage of Open Government maturity. Open data is an enabler and a prerequisite of public participation and collaboration. Through social media, government can benefit from the wisdom of the crowd in form of professional knowledge and innovative ideas. How social media can be utilized to source this wisdom is elaborated in section three. Finally, we discuss the outcome and strategic value of Open Government in the last section.

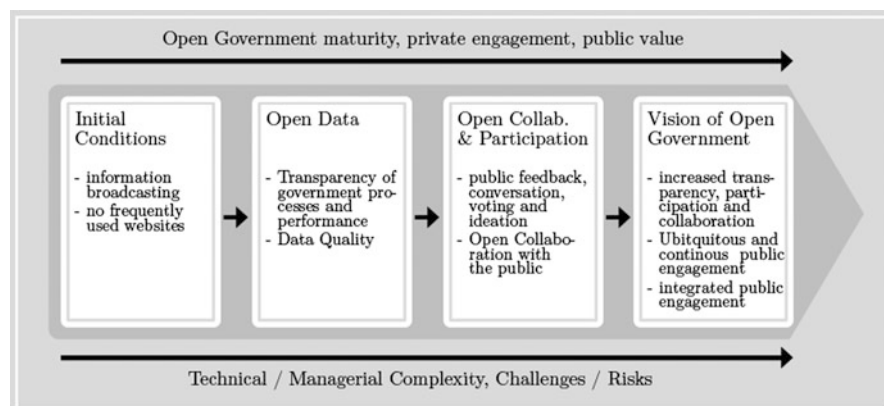


Fig. 6.1 Open government maturity model (Adapted from: Lee and Kwak 2012)

6.2 Transparency

6.2.1 Why Should Administrations Publish Their Data?

The public administration is among the largest creators and collectors of data in different domains. Building authorities store massive amounts of geographical data for planning and monitoring purposes. Most cities run city marketing departments that possess all kinds of tourist information such as museum opening hours, concerts, or city tours. Moreover, statistical agencies gather massive amounts of data about unemployment, demographics, or the environment which is relevant for parliamentarians to come to informed political decisions on social issues. This information is also very valuable for citizens, organizations, and businesses for both democratic and economic reasons.

On the one hand, open data improves the public's ability to hold government responsible. Accountability portals such as Recovery.gov (see Box 6.2) report how public funds are being spent by recipients. This allows citizens to monitor how their money is spent and may ultimately lead to improved legitimization of the collection of taxes. While not every citizen has the capacity to monitor all public spending, the awareness that all information is available might already increase public trust in the distribution and governance of public spending.

On the other hand, open data can foster the creation of innovative products and services. Data portals such as data.gov (see Box 6.3) provide raw data about unemployment statistics, traffic, job offers, or geographical data. By inviting private companies to access and use government data, society can benefit from new value-added services and products provided to citizens for marginal costs. The example of "Application for Democracy" (see Box 6.4) shows that open contests can help to make raw government data useful for citizens and that these competitions can represent a promotion of the local IT business community.

Being concerned about the underdevelopment of the European information market, the European Commission encourages its public agencies to open up government data (Jansen 2011). In 2003, the Commission issued a directive on the re-use of public sector information (directive 2003/98/EC). The main goal was to increase the availability of public sector data as well as value-added information products and services. The directive imposes minimum requirements on the procedures and conditions for re-use. For example, within the European Union, it is not possible for governments to prohibit commercial re-use of the data if noncommercial re-use is allowed. The directive also imposes an upper limit on the possible charges to keep governments from abusing their monopoly as the only producer of a particular type of data. Moreover, several other recommendations on how government should make data available to the public in a transparent, effective, and nondiscriminatory manner are given. While the directive governs the procedures and conditions for re-use, it does not impose any obligation for member states to publish government data. Thus, it depends on each independent European government agency to what extent it will make government data, processes, and activities transparent. We discuss the strategic value of Open Government from a managerial perspective in the last section of this chapter.

Box 6.2 Recovery.gov

Recovery.gov is a US government website with the aim of fostering greater accountability and transparency in the use of funds. The site provides information about how Recovery funds are being spent by the recipients of contracts, grants, and loans, and the distribution of recovery entitlements and tax benefits. The portal was established in alignment with the American Recovery and Reinvestment Act of 2009 and is operated by the therefore newly created Recovery Accountability and Transparency Board.

On recovery.gov citizens can track the overall amount of the Recovery contract, investigate job numbers, the communities where most money is spent, and its top recipients. To get a bigger picture, citizens have the ability to get a category-based view on where the tax money was spent. In addition, recovery.org provides an overview of job opportunities and contracts for bid. It is also possible to report suspected fraud, waste, or abuse of funding via the website. The initiators see the increased public awareness of government data and processes as well as increased government accountability as major contributions of the project to democracy.

Box 6.3 Data.gov

Data.gov is a large-scale, distributed Open Data initiative by the U.S. Federal Government. Data.gov was launched in May 2009 with the purpose of increasing public access to high-value, machine-readable datasets provided by the Executive Branch of the U.S. Federal Government. The idea behind data.gov is that public administrations should treat information as a national asset and empower the public with the information needed to hold the government accountable and foster open innovation. As part of the Open Government initiative, data.gov was expected to promote accountability through the provision of transparency, to encourage people to contribute ideas, and to improve the collaboration between government and industry.

There, citizens can investigate raw data, for example about unemployment statistics or tax income data as well as geographic data. The website also provides access to data contributed by the UN, World Bank, and 172 agencies worldwide. As of November 2012, more than 370,000 data sets were accessible on data.gov.

Box 6.4 Application for Democracy

“Applications for Democracy” was a contest launched by the former chief technology officer of Washington D.C. in late 2008. Previously, the town had released all kinds of public data including real-time crime statistics, school test scores, and poverty indicators in a raw format. To make the open data catalogue useful for citizens in their daily life, the city initiated a prize contest asking citizens to enter mobile apps, web applications, or just written ideas. In total, 47 iPhone, Facebook, and web applications were submitted with an estimated value in excess of \$2,600,000 for the city – to total costs of \$50,000 for prizes.

Exemplarily, one of the winning apps presented information tailored to the place you live in Washington D.C., for example the nearest shopping center, post office, and convenience store. Moreover, citizens could have a look at recently reported crimes near their home and investigate the demographic statistics of their district. Another winning app provided a forum-like interface where citizens could discuss procurements made by the D.C. government. The app provided a list of orders made by the city; citizens could then directly click on one of them and discuss it with other citizens.

6.2.2 What Are the Challenges of Implementing Open Data?

Although the democratic and economic benefits seem compelling, privacy groups and other critics argue that the open data principle (data for everybody for any purpose) violates the principle of purpose specificity that applies to any type of personal data (cf. Chap. 4 Legal Aspects of Digital Service Delivery). The consolidation of different data sets on one platform could potentially enable users to deanonymize certain data sets; a use that was not intended by government. The same holds true from the perspective of the state, which may be threatened by the possibility that inferences relating to classified information may be drawn from the data. The publication of government data can also lead to misinterpretations on the user side, for example if the data is published with only little or no information on how the data was obtained. Finally, through consolidation and matching of different data sets one could potentially detect patterns that could lead to stigmatization of certain residential districts or population groups.

With respect to open innovation, the major concern for public managers is the quality and integrity of the data (Lee and Kwak 2012). As companies base their value-added service and citizens their evaluation of government on the data, the government has to ensure that the data is accurate, consistent, and timely. Moreover, businesses require the data to be offered in a usable and useful way. The data should be available as a complete set in an open and machine-readable format. Central platforms (such as data.gov) should be utilized to make the data accessible to as many businesses, citizens, and nongovernment organizations as possible. To guarantee quality and integrity of the data, the administration should put formal processes in place to govern the lifecycle of data collection and sharing. Apart from accuracy, timeliness and consistency, governance processes should also aim to reduce the “risks of accidentally losing confidential information” or “vulnerabilities of systems to acts of hacking, Denial of Services (DoS) attacks, and intrusion of malware and spyware” (Lee and Kwak 2012, p. 499). Choosing what data sets to open is another challenge. The public administration can ask the community or observe peer agencies to decide which data set to focus on, or publish the probably most valuable or easiest to release data set.

Summary

As the largest creator and collector of data, Open Government aims at making this data valuable for citizens, organizations, and businesses since it fosters the creation of innovative information services and empowers the public to make government accountable. Despite the benefits of open data to citizens and organizations, security and privacy threats are the major barriers to implementing open data initiatives.

6.3 Participation and Collaboration

6.3.1 What Is the Purpose of Citizen-Sourcing?

Citizen-sourcing refers to the process operated by governments that involves outsourcing certain tasks to a distributed group of citizens. There are two main purposes for government to outsource small tasks using ICT. On the one hand, citizen-sourcing initiatives can be used to improve the image of government as an adopter of modern ICT such as wikis, forums, or social networks. On the other hand, government can benefit from citizens' enthusiasm to participate in mass collaboration projects (Nam 2012). Thereby, government can crowd-source their problem to citizens and benefit from the wisdom of the crowd.

There are basically two types of input that government can source from citizens. Professional knowledge can be generated by collecting and consolidating semi-professional expertise from citizens or nongovernment organizations. Social media technologies (as we discuss in the next section) are particularly suitable for production of collective intelligence in a short time period and with little effort by government. Conversely, citizens can participate and collaborate in projects by providing innovative ideas. When it comes to questions on quality of living or other citizen-focused matters, citizens are often better qualified than governments to determine the best course of action.

6.3.2 What Are the Means to Collect the Wisdom of the Crowd?

Nam (2012) suggests four strategies for citizen-sourcing (cf. Table 6.1). The first option is a contest, that is a business-oriented strategy a government can use for its purposes. Participants of the contest are extrinsically motivated, for example by prize money for the best contribution. While the winner gets a reward, the government can benefit from citizens' innovative ideas or professional knowledge. Thereby, government can ask a jury to select the best contribution or let citizens decide which idea or solution is the best.

The second option is a wiki, that is an interdisciplinary website where users can share content. This content is accessible via a web browser and can be directly edited by anyone that enters the wiki. In contrast to the contest, the participants do not have monetary reasons for their engagement, normally they are altruistically motivated. The fact that every user can share and edit content might be a disadvantage of the wiki because it is very vulnerable to abuse. The contents should be purely informative but some participants might try to use the wiki as a platform for advertisement or to systematically place information.

The government can also use social networks to create new relationships with the population. A social network account can also turn into a disadvantage for a government if it is not handled appropriately. Citizens expect immediate reactions and responses. If they are posting criticism or complaints, they will assume immediate explanations to be given or excuses to be made. Even short waiting times for a response may feel endless to users.

Table 6.1 Strategies to collect the wisdom of the crowd (Nam 2012)

Strategy	Mechanism	Motivator	Collected wisdom
Contest	Competition	Materials	Professional knowledge or innovative idea
Wiki	Collaboration	Altruism	Professional knowledge
Social networking	Networking	Relationship	Innovative idea
Social voting	Voicing out	Efficacy	Innovative idea

The last option is social voting where people can post their own ideas and where other users are able to comment on the ideas and vote for them. This is a good method for governments to follow the opinion-forming process of its citizens and to assess public understanding. The advantage for the citizens is that their opinions can be heard, by other citizens as well as by the government. In addition, there is no limit for the amount of ideas that can be evaluated.

Box 6.5. Schwäbisch Gmünd: Finding a New Name for a Tunnel

The city of Schwäbisch Gmünd is an example for social voting. The city was looking for a name for a newly built tunnel. It asked its citizens online for proposals. Supported by a Bud Spencer Fan group, the majority of votes were cast for the name proposal “Bud-Spencer-Tunnel.” Bud Spencer, whose real name is Carlo Pedersoli, was one of the best Italian swimmers before he became a famous actor. In 1951 he participated in a swimming competition between Germany and Italy in Schwäbisch Gmünd.

When the city administration declined the name proposal “Bud-Spencer-Tunnel,” it provoked significant protest in the social media. In the end, a compromise was found and the municipal swimming pool was named after Bud Spencer. However, the experiences with the social voting procedure made politicians skeptical as to whether to use social voting again in the future.

6.3.3 What Are the Challenges of Open Participation and Collaboration?

Apart from the opportunities provided by citizen-sourcing strategies, there are also some major challenges to open participation and collaboration projects. A key aspect is the inequality among different population groups with respect to their access to social media technologies (cf. Chap. 3 The Digital Divide). The problem not only concerns physical access to social media, but also the different abilities of citizens and businesses to utilize social media technologies to become involved in the work of government. Any Open Government project should carefully consider whether the vast majority of the target audience will be able to actively participate. Moreover, minorities without access should be given the opportunity to contribute their ideas, skills, and knowledge in other ways.

In addition to the challenges on the user-side, implementation of Open Government initiatives represents significant and mostly additional work for governments. First of all, governments have to develop the necessary skills to pursue citizen-sourcing strategies. For example, users expect the government to immediately respond to public feedback in a highly competent manner in order to achieve a fruitful, long-lasting, and cooperative relationship. Furthermore, open discussions must be moderated and structured by the government. It needs a lot of experience to manage Open Government initiatives in such a way that professional skills, knowledge, and ideas of the crowd can be fully utilized.

Another challenge is to find the right balance between control and public autonomy. As our example in Box 6.5 shows, the participation of people through social media does not always lead to the intended results. The disadvantage of such direct democratic elements lies in the fact that decision-makers are neither responsible for the result alone, nor can they be held individually liable. If the final decision is ultimately made through other means – as in the case of Schwäbisch Gmünd, it is difficult for politicians to explain the link between public participation and the final decision. This can threaten the legitimacy of decisions ultimately taken by a government.

Summary

Citizen-sourcing allows the government to outsource certain tasks to a distributed group of citizens. Four strategies can be used to collect the ideas and professional knowledge of citizens, namely the contest, wiki, social voting, or social networking. Despite its benefits, citizen-sourcing strategies are challenging. On the one hand, they represent a lot of additional work for governments. Government officials have to be trained in using and engaging with social media tools. On the other hand, citizen-sourcing initiatives can also get out of control when the ideas and opinions of citizens are not fully incorporated into the final governmental decision.

6.4 Evaluating Open Government Initiatives

6.4.1 Why Transparency Might Be Better Than Secrecy?

In his book “Groundwork of the Metaphysic of Morals,” the renowned philosopher Emanuel Kant (1724–1804) provides major insights into the relationship between morality and politics (Kant 1993). Kant describes two different strategies for retaining legitimacy and power – two pertinent goals of governments. On the one hand, he describes the character of the “political moralist” who focuses on getting people to do things with specific ends in view. This view allows a power holder to manipulate, lie, or deceive people in order to achieve certain outcomes (such as peace or political stability). On the other hand, the “moral politician” is a character

assuming that moral actions will necessarily lead to moral ends. Kant argues that the position of the moral (or honest) politician is superior to the “political moralist” since straying from morality requires that “empirical conditions which permit the proposed end to be realized can be assumed to exist” (Kant 1993, p. 122). Thus, because of the unpredictability of achieving beneficial outcomes through immoral means (e.g., concealment of government data to deceive the authorizing environment (citizens)), straying from morality (i.e., openness and transparency) during political activity cannot be justified (Bennington 2011). The normative implication of Kant’s view on politics and morality is that transparency, collaboration, and participation in government should be categorical imperatives for a public administration if legitimacy and retention of power are central goals of decision-makers as we assume in the following.

6.4.2 How Can Open Government Be Strategically Used?

A political philosopher who would not agree with Kant is Niccolo Machiavelli. In his famous book “The Prince” he acknowledged that a power holder who is transparent and faithful to his word will be admired by society but that this transparent authority is not always the most successful (Machiavelli 1992). Compared to Kant, Machiavelli has an opposing view on the prospects for the “political moralist” and clearly prioritizes the individual benefit of the power holder above the collective benefit of society. If we take this self-serving perspective, we have to consider the individual advantage that public managers have when adopting Open Government initiatives.

Compared to their private sector counterparts, public managers have to cope with the misalignment of financial performance, organizational survival, and social value (Moore 2000). Private companies can focus solely on their financial performance and in doing so be sure that they guarantee their survival and the production of social value. In contrast, a focus on financial performance is not sufficient for public managers.

Moore’s (2000) strategy framework for the public sector suggests that managers should focus on three different calculations. First, the value propositions should be clearly formulated and disseminated, that is the social mission plan of the public administration. Second, public managers have to ensure that they have sufficient legitimacy and support in the authorizing environment for their value proposition and how the organization operates. Third, governments have to ensure that sufficient know-how and capability (sourced from inside or outside the organization) are existent to achieve the desired results. The implication of the Machiavellian perspective is that Open Government initiatives are not good by default but have to be evaluated based on their consequences for governments (cf. Fig. 6.2).

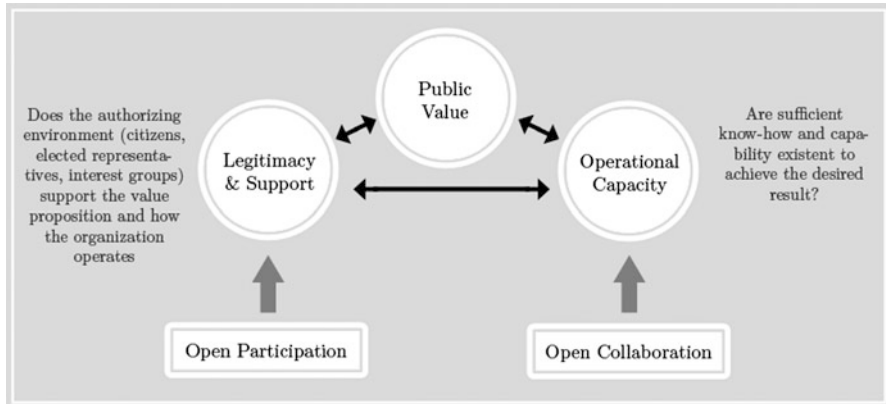


Fig. 6.2 Open government strategy framework (Inspired by: Müller [2012](#))

Summary

Two divergent philosophical perspectives can be applied to evaluate why the government should become involved in starting Open Government initiatives. From a Kantian perspective, straying from openness and transparency cannot be justified because of the unpredictability in achieving beneficial outcomes through extensive state secrecy. From a Machiavellian perspective, the Open Government perspective should be evaluated based on strategic outcomes for government such as operational capacity as well as legitimacy and support.

Chapter Summary

This chapter has provided an introduction to the significant opportunities that social media provides for governments to include citizens in their work. In the introductory part of the chapter we presented the origins and initial conditions that triggered governments to start Open Government initiatives. Next, we discussed why governments should publish their data and the challenges that this endeavor can represent. Moreover, we analyzed the opportunities to outsource certain tasks to citizens using citizen-sourcing strategies. We learned that governments can collect the ideas and professional skills of citizens to improve the quality of their decisions. We also highlighted the fact that this endeavor is challenging for government as these initiatives can embody additional work for government officials and may require intensive training to develop the necessary skills to manage the social media activities of governments. Finally, we discussed two divergent and opposing political perspectives that can be applied to evaluate Open Government initiatives. While Kant would have seen Open Government as a categorical imperative for governments, Machiavelli would highlight that Open Government initiatives should be evaluated based on the consequences for governments.

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Abstract

E-procurement – defined as the use of the internet in public procurement – aims to accomplish a complex set of economic, political, and social goals within a complex legal framework. The implementation of fully electronic processes between contracting authorities and providers is a hard, long road in particular as the majority of public contracts in the EU are awarded by state and local authorities. This chapter provides a general understanding of e-procurement in practice by introducing the legal framework and the technological and organizational opportunities of implementation. The European Commission has just recently proposed fully electronic procurement processes by 2016. As we will discuss in this chapter, the success of this endeavor will highly depend on the efficiency, equity, and effectiveness trade-offs made by all legally independent contracting authorities across Europe.

Learning Objectives*Introduction*

- What is e-procurement?
- Why is e-procurement important?
- What is the difference to private sector procurement?

Legal Framework

- What are the international obligations in public procurement?
- Which tendering procedures are allowed?
- How relevant are international obligations for public administrations?

Implementation Perspective

- What functionalities are needed for e-procurement?
- What are the most common tools used for e-procurement?
- Is there a central “one size fits all solution”?

E-Procurement in Practice

- How does a public administration implement e-procurement?
- What are best practices?

7.1 Introduction

7.1.1 What Is E-Procurement?

Most broadly defined, e-procurement comprises the use of ICT throughout the whole public procurement process. From this angle, ICT supports both internal processes like assessment of tenders and external processes like ordering or submission of tenders. We acknowledge the importance of integrating internal and external processes to leverage all potentials of e-procurement (as we will also discuss later). However, we focus our discussion on a specific subset of ICT-based procurement and define *e-procurement* as the *use of the internet to interact with providers throughout the whole public procurement process*. Moreover, *tools that offer informational, communicational, or transactional services to providers for procurement purposes* are referred to as *e-procurement tools*. As public procurement is highly regulated by international, national, regional, and organizational regulations, the embodiment of the procurement process depends on the legal framework and the nature and size of the public contract.

7.1.2 Why Is E-Procurement Important?

The use of e-procurement in the public sector raises high expectations. Public administrations spend significant amounts of their budget (estimations range from

10 % to 40 %) to purchase goods or services or tender public works. As a consequence, the overall public procurement market accounts for almost 20 % of the European Growth Domestic Product which is worth in excess of €2.4 trillion (European Commission 2012). Thus, the implementation of technology that helps to improve the efficiency of public procurement is an important priority of European and national policy-makers.

The case for e-procurement is compelling. E-procurement is expected to improve the transparency of tendering procedures and increase fair and nondiscriminatory competition. Moreover, moving procurement to the internet can save process costs through time and resource savings as well as product costs through intensified competition for public contracts. The tools commonly used to carry out e-procurement help to improve the quality of procurement procedures and aim to relieve procurement units dealing with complex and highly regulated processes. The resulting savings are supposed to promote fiscal consolidation or to be redirected towards growth-enhancing initiatives across the European Union (EU).

Precisely due to its enormous potential, e-procurement is on the political agenda. In 2005, the Ministers of the European member states decided to place special emphasis on the implementation of e-procurement by defining sophisticated goals.

By 2010 all public administrations across Europe will have the capability of carrying out 100% of their procurement electronically [. . .]. By 2010 at least 50% of public procurement above the EU public procurement threshold will be carried out electronically. (Ministers of European Union 2005, p. 4)

Implementing this goal has been a hard, long road in particular as the majority of public contracts in the EU are awarded by state and local authorities. Because the uptake has not been as high as desired, the goal of the Manchester declaration has recently been renewed in the European Commission's proposal for a reform of the current European public procurement legislation that proposes a transition to fully electronic procedures by 2016 (European Commission 2011). It remains to be seen if this endeavor will be more successful.

7.1.3 What Is the Difference to Private Sector Procurement?

One of the major characteristics of public sector initiatives is that they should promote and consider the welfare of all people living in society. While businesses typically strive for profit-maximization, the public sector has to work within regulations to accomplish desirable politicoeconomic, sociopolitical, and ecopolitical goals. Politicoeconomic goals involve the support of the local business community, the promotion of competition or an anti-cyclic economic policy to mitigate the effects of economic crises. Sociopolitical and ecopolitical goals are reflected in award criteria like compliance with agreed wage scales or use of environmentally friendly materials (Kosilek 2004).

Despite the compelling economic case for e-procurement, inclusive competition for public contracts is hard to achieve in particular among SMEs (small and

medium-sized enterprises). Many small business owners are struggling to exploit e-procurement to get access to new public contract markets (cf. Chap. 3 The Digital Divide). Undoubtedly, the agenda of public sector procurement is more complex than those of private sector procurement where cost and time savings are sufficient justifications for e-procurement implementation. Moreover, the requirements on software tools are less driven by efficiency goals but rather by legal requirements. As we will discuss in the remaining parts of this chapter, legal constraints as well as political and economic considerations mainly influence how a public administration procures works, supplies, and services.

7.1.4 Outline of This Chapter

It is mainly the legal framework and technological opportunities that shape e-procurement in practice. We begin in the following section by providing you with an overview of relevant legal regulations with respect to public procurement in the EU. We introduce different tendering procedures and show how Germany has implemented international obligations. In section three, we give an overview of trade-offs in the implementation of e-procurement in public administrations with respect to the degree of centralization of decision-making and infrastructure. Moreover, we introduce different types of tools that can be used – regardless of how these trade-offs are weighed up – to actually build up and use e-procurement capabilities. Finally, the last section provides insights into e-procurement in practice. Thereby, we discuss the main challenges of implementing e-procurement. Moreover, we provide best practices from initiatives that have facilitated the implementation and use of e-procurement in the public sector.

7.2 Legal Framework

7.2.1 What Are the International Obligations in Public Procurement?

Public procurement within the European Communities is subject to the Agreement on Government Procurement (GPA), an international treaty under the auspices of the World Trade Organization (WTO). The cornerstone principles of the GPA are nondiscrimination and transparency. As such, contracting authorities that are bound to the GPA require that products, services, and suppliers of all parties that signed the GPA are treated equally (GPA §3(1)). Moreover, each party is supposed to publish laws, regulations, and statistics about public procurement activities covered by the agreement (GPA §19(1)). By complying with these principles, member states profess to fair and nondiscriminatory competition for public contracts. Currently, contracting member states are all members of the EU, Canada, Hong Kong, Iceland, Israel, Japan, Korea, Lichtenstein, Netherlands, Norway, Singapore, Switzerland, Chinese Taipei, and United States of America.

In 2004, the EU issued a legislative package on public procurement with the objective to simplify and modernize the legal framework of awarding public contracts (EU directives 2004/17/EC and 2004/18/EC). A directive sets an objective that is to be achieved by Member States but the form and methods used to implement the directive is left to the national authorities. We give an example of the German implementation later (cf. Box 7.1).

The directives explicitly allow the use of electronic means throughout the whole procurement process (§42(1) directives 2004/17/EC). Decisive criteria for tools to be used for electronic communication are set: the tools must be nondiscriminatory, generally available, and interoperable with the ICT products in general use (§42(3) directives 2004/17/EC). As such, the internet is permitted as a medium of transferring electronic bids, requests to participate, and other documents in the context of awarding public contracts. The electronic exchange of information is required to guarantee integrity of data and the confidentiality of tenders or requests to participate (§42(5) directives 2004/17/EC). Therefore, electronic tenders need to be accompanied by an advanced electronic signature or a qualified electronic signature (cf. Chap. 4 Legal Aspects of Digital Service Delivery).

7.2.2 Which Tendering Procedures Are Allowed?

The directives contain regulations about the applicability and embodiment of tendering procedures, that is the procedures to award public contracts to providers. Public contracts are contracts concluded between a provider and the public administration which have as their object the execution of works, the supply of products, or the provision of services. The directives distinguish among five different tendering procedures, namely the open procedure, restricted procedure, competitive dialogue, negotiated procedures, and design contest. A brief description of each procedure is given in Table 7.1.

As a general principle in public procurement, public contracts are awarded based on an open tendering procedure, as long as the public contract or specific circumstances do not justify an exception. The restricted procedure might be applicable when the contract can only be awarded to a specific and limited group of providers. For example, if a public administration aims to procure an airplane, a restricted procedure might be justifiable as only certain providers can build airplanes. In the case of particularly complex contracts where the use of the open or restricted procedure does not allow the award of the contract, contracting authorities may make use of a competitive dialogue. For example, if a contracting authority wants to construct and manage a facility, the contracting authority specifies what it wants (e.g., a school) but how the facility is built and managed is proposed by the candidate. An even more flexible procedure which pulls knowledge and experience from the market is the design contest in which different candidates (e.g., architects) develop a design (e.g., for a new museum) and a jury picks the best design and awards the contract (cf. Ruff 2009).

Table 7.1 EU tendering procedures

Open procedure	Procedure that allows any interested provider to submit a tender
Restricted procedure	Procedure that allows any provider to request to participate but only those providers invited by the contracting authority are allowed to submit a tender
Competitive dialogue	Procedure in which the contracting authority conducts a dialogue with the candidates admitted to that procedure, with the aim of developing one or more suitable alternatives capable of meeting its requirements, and on the basis of which the candidates chosen are invited to tender
Negotiated procedures	Contracting authorities consult the provider of their choice and negotiate the terms of contract with one or more of these

During the tendering procedure, contracting authorities can request evidence from providers proving that they are competent, reliable, and capable of fulfilling the contract. Candidates can be excluded from the awarding procedure, for example if they entered into liquidation or if they did not pay taxes or social charges. To reduce the costs involved in candidates providing such evidence, some countries explicitly allow the use of a central database that stores evidence of the capabilities and competences of potential candidates.

7.2.3 How Relevant Are International Obligations for Public Administrations?

The vast majority of public contracts (about 84 %) in the EU are not obligated to follow international legislation. The directives only apply to public contracts which have a value estimated to be equal to or greater than the thresholds depicted in Table 7.2. Nevertheless, national procurement legislations (cf. Box 7.1) prescribe similar procedures that are often less formalized and less time consuming.

In addition to formal procedures like the open or restricted procedure, contracts of smaller value can be awarded based on rather informal procedures. For example, in a discretionary awarding procedure, contracting authorities consult three providers of their choice and negotiate the terms of contracts with one of these. Another opportunity to purchase standardized and low-cost supplies (e.g., stationery) is to award framework agreements between a contracting authority and one or more suppliers in advance. For the award of contracts based on a framework agreement, contracting authorities or their employees request that the respective supplier supplement its tender as necessary. For example, employees can select pens or other writing material in a catalogue with prices that have been negotiated in advance by the procurement unit. Thereby, the procurement unit can leverage the buying power by guaranteeing a minimum amount of orders within a certain time period.

Table 7.2 EU procurement thresholds

	Supplies and services	Professional services	Construction services
Central government authorities	€130.000		€5.000.000
Subcentral contracting authorities	€200.000		

Box 7.1 Procurement Legislation in Germany

In Germany, the public administration is subject to public procurement law due to their status as a territorial authority. The European legislative package on public procurement is implemented by the law against restraints of competition (“Gesetz gegen Wettbewerbsbeschränkungen,” GWB for short), the regulation on the award of public contracts (“Verordnung über die Vergabe öffentlicher Aufträge,” VgV for short), and three contracting rules for awarding public contracts (“Vergabe- und Vertragsordnung für Leistungen,” VOL for short; “Vergabe- und Vertragsordnung für Bauleistungen,” VOB for short; “Vergabeordnung für freiberufliche Leistungen,” VOF for short).

The GWB constitutes the federal procurement law for supplies, services, and works above the EU thresholds. In accordance with the GPA, the GWB contains key principles for awarding public contracts (e.g., fair competition, nondiscrimination, and transparency) (GWB §97 (1)–(4)). Most importantly, the GWB allows the federal government to define more detailed regulations about awarding public contracts by passing further administrative orders (GWB §97 (6)). These administrative orders are summarized in the VgV. The VgV essentially regulates the application area of federal procurement law (§2 VgV) and points to the contracting rules for the award of contracts for public supplies and services (VOL/A), the contracting rules for the award of contracts for construction services (VOB/A), and the contracting rules for the award of contracts for professional services (VOF) (§4–6 VgV). Thus, the GWB and VgV do not contain any detailed regulations about tendering procedures or awarding criteria. Moreover, the vast majority of public contracts are below the respective EU threshold. In that case, GWB and VgV do not apply. Within the public administration public procurement below EU thresholds is regulated by the Budget Codes of the federal states which regulate that the contracting rules are also applicable for public contracts below EU thresholds. Therefore, German procurement law is mainly defined by the contracting rules for awarding public works, supplies, and services.

According to the contracting rules, public contracts are awarded based on an open tendering procedure (“Öffentliche Ausschreibung”) as long as the

(continued)

Box 7.1 Procurement Legislation in Germany (continued)

public contract or specific circumstances do not justify an exception. The contracting rules contain detailed regulations about these exceptions (§3(3) VOB/A, §3(3)–(6) VOL/A) and the embodiment of the tendering procedures. Similar to the EU directive, three tendering procedures are allowed. The open procedure allows any interested provider to request and obtain the contract award documents and to submit a bid (§3(1) No. 1 VOB/A, §3(1) No. 1 VOL/A). As opposed to the open procedure, the restricted procedure (“Beschränkte Ausschreibung”) allows only a limited number of providers to participate (§3(1) No. 2 VOB/A, §3(1) No. 2 VOL/A). Thereby, a public request for information (“Teilnahmewettbewerb”) should precede the restricted procedure. In a public request for information providers are invited to apply for participation by providing information about their competences and capabilities.

As opposed to the open and restricted procedure, the discretionary award of public contracts (“Freihändige Vergabe”) does not involve any specific formal rules (§3(1) No. 3 VOB/A, §3(1) No. 3 VOL/A, §5(1) VOF). In a discretionary awarding procedure, contracting authorities consult the providers of their choice and negotiate the terms of contracts with one or more of these. Just as for the restricted procedure, a public request for information can precede the discretionary award of a contract if appropriate.

Another opportunity to purchase supplies and services is to award framework agreements between a contracting authority and one or more suppliers in advance. Framework agreements establish the terms governing contracts to be awarded during a given period. For the award of contracts based on a framework agreement, contracting authorities can request that the respective supplier supplement its tender as necessary. Finally, if public supply and service contracts are of particularly small value, administrations can purchase supplies and services directly without any price comparison.

Contracting authorities can request evidence from providers proving that they are competent, reliable, and capable of fulfilling the contract (§8(3) No. 1 VOB/A, §7(4) VOL/A). Candidates can be excluded from the awarding procedure, for example if they entered into liquidation or if they did not pay taxes or social charges (§8(5) No. 1 VOB/A, §7(5) VOL/A). To reduce the costs involved in candidates providing such evidence, VOB/A explicitly allows the use of a central database that stores evidence of the capabilities and competences of potential candidates (§8(3) No. 2 VOB/A).

The contracting rules explicitly allow the use of electronic means throughout the whole procurement process (§16(4) VOL/A, §16(3) No. 1 VOB/A, §4

(continued)

Box 7.1 Procurement Legislation in Germany (continued)

(6) VOF). Decisive criteria for tools to be used for electronic communication are set: the tools must be nondiscriminatory, generally available, and interoperable with the ICT products in general use (§16(3) VOB/A, §16(5) VOL/A, §4(7) VOF). As such, the internet is permitted as a medium of transferring electronic bids, requests to participate, and other documents in the context of awarding public contracts. The electronic exchange of information is required to guarantee integrity of data and the confidentiality of bids or requests to participate (§21 VOB/A, §21(1) Nr. 2 VOL/A, §4(8)). Therefore, electronic bids need to be accompanied by an advanced electronic signature or a qualified electronic signature as defined in the German law on electronic signatures (“Signaturgesetz,” SigG for short) (§21(1) VOB/A, §21(1) Nr. 2 VOL/A, §4(9) VOF).

To sum up, German procurement law is formulated by the contracting rules for awarding public contracts. The contracting rules explicitly allow the use of electronic means throughout the whole public procurement process. Essentially, there are three distinct procedures applicable to awarding a public contract: namely the open procedure, the restricted procedure, and the discretionary awarding procedure. Moreover, contracting authorities can request that the respective supplier supplement its tender as necessary based on framework agreements or can purchase supplies and services directly without any price comparison. The specific circumstances and characteristics of the public contract determine the applicable tendering procedure.

Summary

Overall, procurement legislation is complex and places special emphasis on fair competition, nondiscrimination, and transparency. While open procedures are more time consuming, they allow any provider to participate in the awarding procedure. Only under specific circumstances can awarding procedures be limited to a restricted group of providers or be conducted in a less transparent manner. European legislation is relevant only for less than a fifth of all public contracts. Therefore, it depends on national legislation as to how the trade-off between efficiency on the one hand and equity on the other is made (cf. MacManus 2002). German procurement legislation appears to prioritize fairness compared to efficiency by describing only a handful of exceptional cases where the competition for public contracts is harmed.

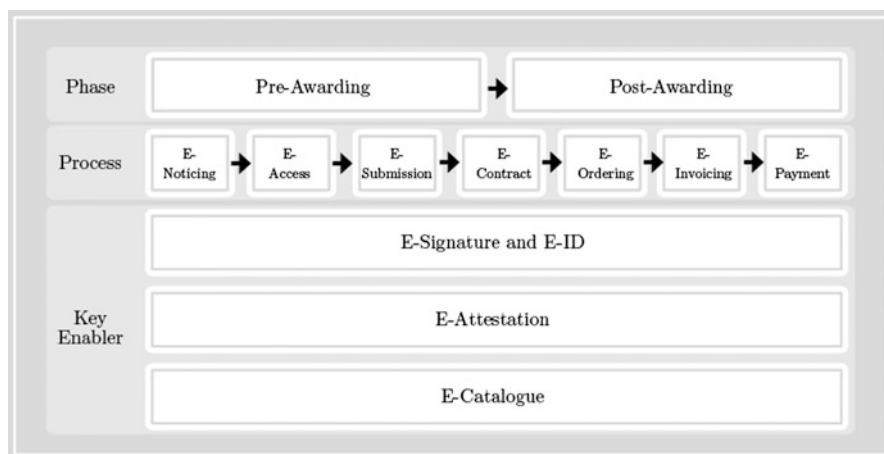


Fig. 7.1 Building blocks and key enablers of e-procurement

7.3 Implementation Perspective

7.3.1 What Functionalities Are Needed for E-Procurement?

The legal framework determines the scope in which public procurement takes place. The public procurement process can be subdivided into a preawarding and postawarding phase (as depicted in Fig. 7.1). In both phases several technical functionalities enable a fully electronic process between contracting authorities and providers. These capabilities are briefly introduced in the following.

In the preawarding phase, the contracting authority organizes the competition for the public contract. In cases where a public notice is part of the tendering procedure, the contracting authority must be capable of publishing the public notice on an internet platform (e-noticing). The public notice includes information about the requested supplies, services, or works and an electronic contact address from which further information can be requested. In order for candidates to obtain this information electronically, contracting authorities must be capable of providing electronic access to contract awarding and other supporting documents (e-access). The preawarding phase ends with the electronic submission and processing of tenders (e-submission).

In the postawarding phase the public contract is implemented and settled. After the contracting authority selects the winning tender, both parties must be capable of electronically concluding a contract (e-contract). If the contract does not directly cause the delivery of the procured good, for example in the case of a framework agreement, the contracting authority selects and orders the required products from an electronic catalogue (e-ordering). After the completion of the public contract, an electronic invoice is sent from the provider to the contacting authority

Table 7.3 E-procurement tools

	Tendering platform	Catalogue system
Procedures	Formal: EU and national procedures	Informal: Direct purchases and orders from framework contract
Examples of purchases	Construction works, consulting services	Stationery, books
Building blocks	E-noticing, E-access, E-submission (E-contract, E-invoicing, E-payment)	E-ordering (E-invoicing, E-payment)
Key enablers	E-signature, E-attestation, E-catalogue	E-catalogue

(e-invoicing). Finally, the invoice is settled using an electronic payment system (e-payment) (Stoll 2007, p. 10).

The capability to process electronic signatures (e-signature) and evidence (e-attestation) is a mandatory condition to implement a fully electronic process. The electronic signature is needed to ensure the authenticity and integrity of all transactional interactions (cf. Chap. 4 Legal Aspects of Digital Service Delivery). The capability to process evidence proving that candidates are competent, reliable, and capable of fulfilling the contract is also necessary to enable fully electronic communication. Finally, an electronic catalogue is required to exchange product information throughout the whole procurement process (e-catalogue). While in the preawarding phase the catalogue is the basis for an offer by specifying the tender, in the postawarding phase the catalogue is the basis for the implementation of the contract.

7.3.2 What Are the Most Common Tools Used for E-Procurement?

Two main and distinct types of e-procurement tools exist and are described in the following. Software solutions that can be assigned to one of the two types typically vary with respect to the degree they implement the key enablers and building blocks introduced earlier and the extent to which the solution can be integrated into the existing ICT infrastructure (Nekolar 2002). A tendering platform manages tendering procedures through a web site and typically implements formal procurement procedures like the open or restricted procedure (cf. Table 7.3). The platform may allow a contracting authority to publish public notices, to supply the contract documents and specifications to candidates, and to receive tenders. Specific products like construction works or consulting services are typically procured through tendering platforms. Receiving tenders requires the processing of electronic signatures, attestations, and catalogues. Tendering platforms can be integrated into existing ICT systems, for example tools that compile contracting documents or assess tenders. Even more advanced solutions may also cover the implementation of the contract which involves contracting, invoicing, and payment.

In contrast, a catalogue system deals with informal procurement procedures like direct purchases or orders based on framework agreements. The catalogue system

allows requesters of goods and services to search for and select products in electronic catalogues which are authorized and negotiated by central procurement in advance. Standardized products like stationery or books are typically purchased through catalogue systems. More advanced catalogue systems also enable the processing of electronic invoices and online payment as well as integration into existing ICT systems, for example enterprise resource planning or financial accounting. We will provide examples of tendering platforms and catalogue systems in practice in a later section of this chapter.

7.3.3 Is There a Centralized “One Size Fits All Solution”?

The implementation of e-procurement in a public administration requires that three issues have to be resolved in advance, namely the degree of centralization of decision-making at an organizational level, the degree of centralization of decision-making at an interorganizational level, and the degree of centralization of computing infrastructure (Ramanathan 2004). These three steps provide an insightful perspective on the challenges of implementing e-procurement in a public administration. The trade-off between centralized versus decentralized e-procurement depends on both efficiency and the political considerations of legally independent actors within the public administration. Coordination is especially hard to achieve because the nature of federalism (cf. Chap. 5 Online One-Stop Government) implies certain degrees of independence among the administrations and thus limits the possibilities of imposing a “one size fits all” solution across the public administration.

The debate regarding the degree of centralization of decision-making at an organizational level is about who will decide on works, services, and suppliers that a public administration requires and from which provider it is procured from. Gurbaxani and Whang (2009) analyze this trade-off from an economic perspective. They argue that the optimal organizational structure is one in which the internal coordination costs are at a minimum. The internal coordination costs are composed of agency costs and decision information costs. When procurement is decentralized within an organization, end-users make their own procurement decisions. Therefore, end-users can act in their own self-interest instead of serving the organization which is termed agency costs. These costs can be minimized through monitoring, which costs as well. Organizations that have a decentralized procurement structure are not able to obtain the same volume discounts as organizations that have a centralized procurement structure. When procurement is centralized, end-users send their requests to the central procurement unit and the central unit takes the procurement decision. In order to make good decisions, the central procurement unit needs to be aware of the end-users’ requirements. The costs for obtaining this information are referred to as decision information costs. From an economic perspective, centralizing public procurement is more efficient because the use of ICT is supposed to reduce decision information costs far more than the agency or monitoring costs. Nevertheless, most public procurement activities are still highly

decentralized within public administrations which might be to some extent a leftover of the new public management era where budgeting and procurement have been decentralized (cf. Chap. 2 Impact of Digital Governments). Establishing a centralized procurement unit is a challenging task as public employees have to give up their decision-making power to a centralized unit (Ramanathan 2004). Research on IT implementation suggests that the power shift implied in an e-procurement system faces resistance from employees who have to give up their decision-making competence (Markus 1983).

Centralizing decision-making at an interadministration level is much more complex. In one extreme, there could be a centralized procurement authority serving many or even all public administrations. In the decentralized extreme, public administrations make their own procurement decisions. As opposed to the previous scenario, political rationalities play a much stronger role here. The main difference to private sector procurement is that the public procurement works within regulations to accomplish desirable social and economic goals. When public procurement is centralized, public administrations hand over an important political instrument to a central authority. This contradicts greatly with the political structural context of local administrations who are interested in supporting their own local economy. Therefore, it is very unlikely that legally independent public administrations will fully outsource their procurement unit to a central procurement organization.

The question about the level of centralization of computing infrastructure is important to many areas of digital government. While private firms often treat information systems as proprietary and use them as a competitive advantage, a public administration can and is encouraged to share their software applications and hardware (Caudle et al. 1991). As we discuss later, there is a tendency to use shared platforms and thus to centralize public procurement infrastructure. The main problem of establishing a single point of access to public contracts is the challenge of integrating these systems into internal ICT systems such as enterprise resource planning or financial accounting solutions. As the benefit of implementing e-procurement depends greatly on the level of integration of e-procurement into existing ICT systems, the development of standard interfaces for financial data matching or electronic signatures is another major challenge.

Summary

To sum up, a fully electronic procurement process between providers and contracting authorities requires that a considerable number of functionalities are available to a municipality. A municipality needs to be capable of publishing public notices, providing access to contracting documents, processing bids, signatures and evidence, concluding contracts with the winning bidder, sending orders, receiving invoices, and finally settling contracts over the internet. Tendering platforms and catalogue systems are the most common e-procurement tools that offer these functionalities. The implementation of a centralized “one size fits all” e-procurement solution in a

(continued)

Summary (continued)

public administration is challenging as coordination among legally independent and self-seeking public administrations is hard to achieve. The political structural context needs to be considered to understand the trade-offs between centralization and decentralization of decision-making and infrastructure.

7.4 E-Procurement in Practice

7.4.1 How Does a Public Administration Implement E-Procurement?

In practice, one can observe tendencies with respect to the trade-offs between centralization versus decentralization of decision-making and ICT infrastructure in public administrations. These tendencies vary with respect to the characteristics of the public contract. On the one hand, there are highly standardized supplies and service contracts with low per unit costs, for example writing materials and books. These units are typically procured based on framework agreements directly with a supplier or with an intermediary public procurement office. If the public administration decides to negotiate its own framework agreements for standardized contracts with one or more local suppliers, the suppliers typically also provide the necessary ICT infrastructure that allows public employees to order supplies and services via a web shop. Similarly, federal- or state-level procurement offices offer web shops where they offer competitive prices that leverage the buying power of the public administration (cf. Box 7.4). Thus, decision-making and infrastructure are often centralized for the procurement of standardized supplies and services with low per unit costs.

On the other hand, complex supplies, services, and works with high contract value are typically awarded based on a formal tendering procedure. Therefore, tendering platforms are called into action. In the EU, there is a variety of tendering platform services which allow public administrations to electronically communicate with providers throughout the whole tendering procedure. While the EU and many national and state administrations publish tender notices on one central platform (cf. Box 7.2), the tendering platforms for accessing contract award documents and submitting tenders are still quite heterogeneous across Europe (cf. Box 7.3). Therefore, the development of standards for electronic communication between contracting authorities and providers is subject to several powerful political initiatives (cf. Box 7.5).

While the infrastructure is more and more centralized, decision-making is still highly decentralized as complex public contracts typically require a lot of information and awareness of the end-users' requirements. Therefore, maintaining a

decentralized organizational structure for complex public contracts is more efficient for most public administrations that have sufficient legal expertise in public procurement.

7.4.2 What Are Best Practices?

Box 7.2 Tenders Electronic Daily

Tenders electronic daily (TED) is a multilingual service offered by the European Union which gives information about all tendering procedures above EU threshold in the EU. It represents a digital supplement of the European Journal of the European Communities. The project aims to provide a framework for a transparent and nondiscriminatory procurement process.

The service itself is free to use and offered five times a week, enclosing approximately 1,500 public notices. Each public notice is published in all 23 languages spoken in the European Union. The tender notices can be searched and categorized by country, region, industry sector, and other criteria. In addition, users have the possibility to create e-mail alerts and personalized news feeds. In addition to current tenders, users have the possibility to access a five-year archive of past public contract announcements (cf. <http://ted.europa.eu>).

Box 7.3 Tendering Platform of the Federal German Procurement Office

“E-Vergabe” is the e-procurement platform of the federal German public procurement office. The platform was launched in 2003 with the aim of providing a transparent and fast tendering process. After a registration process the service is offered for free. Searches for public notices can be performed in a customized manner using criteria such as industry sector and geographic location. Complementary training materials, a website and phone service is provided to support stakeholders in using the platform. In 2012 more than 3,000 bidders were registered on the platform, growing at an average of 100 new bidders per month. Since its launch approximately 3,400 tender announcements have been set up and more than 90 contracting authorities are online (cf. <http://www.evergabe-online.de>).

Box 7.4 Austrian Federal Procurement Office

The “Bundesbeschaffungsamt” (BBG) is the federal procurement provider in Austria. In 2006, the BBG launched its e-procurement platform. The aim is to increase transparency and fair competition, as well as to realize cost savings. Therein, Austrian authorities can directly create tenders according to their needs. The BBG manages the announcements and organizes the registration of businesses bidding for the tenders. Especially small and medium-sized businesses are encouraged to use the platform.

In 2011, approximately 1.088 bn Euro were processed and cost savings of 18 % could be realized. On average, every third Austrian municipality uses BBG’s e-procurement solution (cf. <http://bbg.gv.at>).

Box 7.5 Project: Pan-European Public Procurement Online

In 2008, a consortium of 11 European countries consisting of Austria, Denmark, Finland, France, Germany, Greece, Italy, Norway, Portugal, Sweden, and the UK initiated the “Pan-European Public Procurement Online” (PEPPOL) project. As most of the existing e-procurement solutions were focused on a national level, PEPPOL seeks to align e-procurement processes across all governments in Europe. In particular, the project’s aims are to expand market connectivity, interoperability, and efficiency in government procurement.

PEPPOL is designed as an open and standardized platform, allowing any supplier in the European Union to respond to any public tender. The consortium estimates that the platform enables cost savings of 50 bn Euro (cf. <http://peppol.eu>).

Summary

While there is no “one size fits all” solution for public administrations, several best practice solutions have emerged over the last decade. Public notices are published on one central platform. Tendering platforms are still quite heterogeneous and initiatives aim to standardize and link these platforms towards a single point of access to public contracts. Finally, catalogue systems are widely used in public administration. Their infrastructure is either provided directly by the provider or through an intermediary organization which aims to leverage the buying power of the public administration.

Chapter Summary

Public sector e-procurement is a broad subject of study. E-procurement aims to accomplish a complex set of economic, political, and social goals within a complex legal framework. European legislation explicitly allows the use of electronic means throughout the whole public procurement process. The specific circumstances and characteristics of the public contract determine the embodiment of the tendering procedure. Two types of e-procurement tools are used by public administrations. Tendering platforms that are typically hosted centrally enable public administrations to award public contracts electronically. Catalogue systems that are typically hosted by providers or public procurement offices enable public administrations to procure standardized supplies and services based on framework agreements.

This chapter has given you an idea of the legal constraints, the technological and organizational opportunities, and the implementation of e-procurement in practice. The European Commission proposes to fully implement e-procurement across public administrations by 2016. The success of this endeavor will highly depend on efficiency, equity, and effectiveness trade-offs made by all legally independent contracting authorities across Europe.

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Abstract

The widespread diffusion of personal computers and the internet have facilitated more convenient and less expensive forms of voting. While these solutions are promising, their introduction is typically accompanied by the concerns of candidates and voters regarding the integrity of the results. Within this chapter we first discuss the benefits and disadvantages of voting machines which can be used to improve voting at the polling place. Afterwards, we analyze the opportunities and concerns related to internet voting as a replacement tool for voting per mail. Finally, we present different e-voting practices and discuss why certain countries are ahead in the development of e-voting approaches.

Learning Objectives*Introduction*

- What is the goal of voting systems?
- What is e-voting?
- Is e-voting the silver bullet to modernize democracy?

Voting Machines

- Which voting technologies are available?
- What are the pro and cons of DREs?
- What are the pro and cons of optical scan technology?

Internet Voting

- What is internet voting?
- Why internet voting?
- What are the concerns about internet voting?
- How can a transition to internet voting be realized?

E-Voting in practice

- Why administrators tend to implement e-voting?
- What are best practices?

8.1 Introduction**8.1.1 What Is the Goal of Voting Systems?**

In a democracy, political power is derived from the vote of the people, either by direct policy referendum or by means of elections. In this process, voting systems focus on the collection and aggregation of voters' preferences to produce collective decisions. A democratic voting system provides elected representatives or any other decision taken by the electorate with legitimacy, that is the outcome is recognized and accepted as right and proper by the electorate.

There are many requirements for voting systems which aim to improve their integrity and thus, the acceptance of outcomes. A selection of criteria is listed in Table 8.1. Fulfilling these requirements involves making trade-offs between economic and democratic considerations. For example, while increasing the number of electoral offices may improve convenience for voters and thus participation, this would also result in higher costs for conducting elections or policy referenda. Overall, if people do not trust the outcomes of the voting system or people do not participate in the voting process, this can threaten the legitimacy of the elected representatives, the referendum, or the political system as a whole. Therefore, new ICT-based innovations in the voting process have to be evaluated based on these requirements.

Table 8.1 Requirements for voting systems (Mercurio 2004)

Eligibility	Only authorized and eligible voters should be allowed to cast ballots
Accuracy	Voter's intent should be recorded and counted correctly, to ensure that the will of the people is represented
Uniqueness	Voters should only be allowed to cast one ballot each
Integrity	Votes which are forged, modified, or deleted should be detected
Verifiability and auditability	Verification that all the votes have been accounted for in the final tally and that reliable and authentic records exist to that effect
Reliability	No vote should be lost, even when faced with electoral failures
Secrecy and noncoercibility	Voting is carried out in secret without voters ever having to reveal how they cast their respective ballots
Flexibility	Election equipment should be accessible to all voters, including those with disabilities
Convenience	Voters should be able to quickly cast their ballot without undue delay
Certifiability	Voting systems should be regularly tested and certified to ensure against electoral failure
Cost-effectiveness	Voting systems should be affordable while still being efficient and effective
Transparency	Voters should possess a general understanding of the voting process and should not be deceived into voting a certain way

8.1.2 What Is E-Voting?

Voting systems can be classified with respect to the medium used and the place where the vote is cast (cf. Table 8.2). In its simplest form, a vote is taken by counting the raised hands of a group of people in a room. This approach is limited to a certain amount of people and is not useful for elections or policy referenda which typically involve millions of voters. Most elections or referenda use paper-based procedures to collect, count, and aggregate votes. On a typical Election Day, constituents are asked to cast their vote in public polling places which are controlled by public officials to ensure a free, fair, and secret election. Optionally, voters are allowed to vote remotely (postal voting) if they are unable to come to the polling place in person on Election Day. The first ICT-based voting machines were used in the United States in the 1970s where they complemented paper ballots, lever machines, or punch card machines to record election outcomes (Smith and Clark 2005). Voting machines are deployed at polling places which are controlled by public officials and are used to cast, count, and report votes. The latest electoral revolution is internet-based voting in which constituents – similarly to postal voting – cast their vote remotely from their home computer. In this chapter, we focus on e-voting which comprises all ICT-supported voting systems. In particular, we look at the advent, controversies, and current status of voting machines in Europe. Moreover, we discuss the opportunities and disadvantages of internet voting for elections, policy referenda, and the political system as a whole.

Table 8.2 Classification of voting systems (Krimmer 2008)

Medium	Controlled Environment	Uncontrolled environment
Hand	In-person	–
Paper	Polling machine	Postal voting
ICT	Voting machine	Internet voting

8.1.3 Is E-Voting the Silver Bullet to Modernize Democracy?

Proponents of direct or plebiscitary democracy praise the great opportunities of e-voting and call for more direct democratic elements in politics and policy-making. This move towards a ‘push-button democracy’ (Buchstein 2001) necessitates that all controversial political issues are decided by the vote of the people instead of the vote of elected representatives (cf. Chap. 2 Impact of Digital Governments). However, opponents have brought forward legitimate democratic concerns which have put a stop to many e-voting initiatives around the world.

One issue – that we have already discussed in depth – is inequality regarding access to ICT, that is access to internet-based voting systems (cf. Chap. 3 The Digital Divide). If internet access is unequally distributed, the digital divide could reinforce the inequality between those who do and those who do not participate in the political decision-making process. In the current paper-based systems, minorities are already more likely to be disregarded and misrepresented. Moving the voting process to the internet would probably reinforce this gap.

There are also important political concerns with online voting and the claim of proponents that e-voting would increase participation:

Online voting will foster the unreflective spontaneity of voters which have put only little mental energy into the act of voting. At the end, it would have been better for democracy, they have waived their ‘junk-vote.’ If their walk to the ballot box already represents an unendurable obstacle, e-voting should not be the mean to remove this last imposition to cast a vote. (translated from German, Buchstein 2001, p. 155)

Thus, opponents argue that increased participation should not be achieved by simplifying access to already easily accessible voting procedures but by fostering political culture and increasing the number of politically interested constituents (cf. Chap. 9 E-Participation). Otherwise, an advance of populist political styles could be the consequence when uninformed constituents decide spontaneously on complex political issues.

Another concern is the cultural change induced by internet voting. Opponents argue that the place where constituents vote is not without symbolic meaning. The walk to the ballot box has a ritual character which makes voters aware of the importance of the election or policy referenda.

Traditional voting is seen to promote the community over the individual, where the civic duty of voting is ritualistically followed by all citizens, citizens whom for one moment in time enjoy equal standing of all others, regardless of situation, wealth, color, belief, or education. On the other, if one segment of society opts to vote remotely instead of physically going to the polling station, the community ideals formed by voting are seen to disappear. (Mercurio 2004, p. 136)

Thus, the traditional polling place symbolizes the relation of the vote to the social community. As a consequence, a potential relocation of the polling station from publicly controlled places into people's living rooms could harm the belief in social cohesion and solidarity within the society as a whole.

8.1.4 Outline of This Chapter

Despite these concerns, e-voting is gaining ground in practice. Within this chapter, we will first introduce different types of voting machines which have certain benefits compared to casting votes on paper. At the same time, we discuss the specific disadvantages of these voting technologies. In the third section, we analyze the opportunities of internet voting as a replacement tool for voting per mail. Finally, we present in section four e-voting in practice. Thereby, we explain why certain countries are ahead in the development of e-voting approaches and introduce a best practice from the EU.

8.2 Voting Machines

8.2.1 Which Voting Technologies Are Available?

The ultimate goal of voting machines is that voters perceive that votes are recorded, stored, and tabulated correctly. At public polling places, different paper-based, mechanical and ICT-based voting machines are used, namely paper ballots (paper based), lever machines, punch cards (both mechanical), and ICT-based systems like direct recording electronics (DREs) or optical scan voting systems. A short description of how these voting machines record, store, and tabulate votes is given in Table 8.3. While all these technologies offer considerable cost savings and instant voting results compared to the paper-based procedure, they differ with respect to the likelihood of producing residual votes, the potential for tampering and failure and their ability to recover (Moynihan 2004).

8.2.2 What Are the Pro and Cons of DREs?

The use of ICT-based voting machines at the polling place has a long tradition in particular in the United States where voting machines have been used since the 1970s and complement paper ballots, lever machines, or punch card machines to record election outcomes (Smith and Clark 2005).

Table 8.3 Voting machines (cf. Moynihan 2004)

Technology	Vote recording	Vote storing	Vote tabulation
Paper	Voter marks preferences next to printed list of options	Paper ballot in sealed box	Paper ballots are counted by officials
Levers	Voter pulls lever next to candidates name; machine mechanically counts	Mechanical storage, no paper trail	Machine reads out final tally
Punch cards	Voter uses computer readable card to mark vote by punching hole directly into a ballot card	Ballot card in sealed box	Computerized tabulation machine reads votes by identifying holes in the ballot
DRE	Voter directly enters choices with the use of a touch screen, push buttons, or similar device	Digital storage, no paper trail	Machine reads out final tally
Optical mark recognition	Voter marks computer readable paper ballot; ballot is dropped into sealed box	Paper ballot in sealed box	Computerized tabulation machine counts votes based on paper ballots and optical mark recognition software
Voting pen	Paper ballots are filled out with an electronic voting pen; thin pattern on the paper ballot enables electronic recording of voter's choice	Paper ballot and digital storage	Voting pen reads out final tally, manual recount of paper ballots possible

DREs allow voters to enter their choices with the use of a touch screen, push buttons, or similar devices. Thereby, votes are stored in these machines on a memory cartridge, diskette, or smart card and added to the choices of all other voters for tabulation. There are many benefits of DREs compared to traditional paper-based voting (cf. Box 8.2). On the one hand, they offer significant cost savings (less paper used) and instant voting results. On the other hand, they allow the flexible implementation of complex ballots and assist voters in filling out their electronic ballot by offering multilingualism and disability-friendly interfaces. Thus, they allow disabled people to cast their vote without human assistance and simplify the act of voting for nonnative speakers. Overall, DREs may increase the flexibility, convenience, and cost-effectiveness of voting procedures. However, in the rush to improve these requirements, DREs may also sacrifice the integrity, verifiability and auditability, reliability, and transparency of the voting process.

Accuracy is how well the process maps voter intent to counted votes and the final tally (Dill et al. 2003). Unfamiliarity with the user-interface makes DREs prone to inaccurate outcomes (cf. Box 8.1). Such problems can only really be discovered for gross errors, for example, should one favored candidate receive absolutely no votes, but not for each individual vote. Statistics show that DREs have significantly more residual votes, that is votes lost because of invalid or unreadable ballots, than paper-based procedures (Moynihan 2004).

Another allied problem is error-prone voting software (cf. Box 8.3). Whether user input is transformed into accurately counted votes, depends on the software code of the DRE. However, the source code remains inaccessible to voters for all

proprietary voting machine vendors. Thus, the integrity of outcomes rests also on implicit trust in the vendors, their developers, as well as inspection authorities who have access to the machine software.

Almost all the DREs currently certified [...] have an ‘audit gap’ between the voter’s finger and the electronic or magnetic medium on which the votes are recorded. Because the ballot must remain secret, there is no way to check whether the votes were accurately recorded once the voter leaves the booth; neither the recorded vote nor the process of recording it can be directly observed. (Dill et al. 2003, p. 29)

Highly reliable software systems typically not only emphasize the prevention of errors but are also designed to have countermeasures in place that are able to quickly retrace and remedy the failure. Paper-based procedures allow an *ex post* examination of the paper ballots after Election Day. Thereby, voters and candidates can ensure themselves that the voting technology worked in an accurate and honest fashion. As most DREs do not produce a paper trail, auditability and verifiability are not fulfilled by DREs. As long as DRE vendors hide their source code and user-interfaces are immature, it remains hard to establish trust in accurate DRE voting systems.

Box 8.1 Unfamiliarity with the User-Interface: Fraud in Clay County, Kentucky, United States

A case of e-voting fraud was detected in Clay County, Kentucky, United States where election officials offered to buy votes from voters. Because of the complex voting machine, users could ask for “assistance” in the voting process. This way voting officials could verify that the vote was cast as had been agreed upon in advance. Later, officials found out that voters could be manipulated in much simpler fashion: they suggested to the voters that a ballot could successfully be cast by pressing the “vote” button. However, each vote needed to be confirmed by clicking the “confirm” button afterwards. If voters did not do so, election officials could enter the booth after the voter had left and change the vote.

Box 8.2 The Case for DRE Voting Machines

In the 2000 presidential election in the United States, George W. Bush won narrowly against his competitor Al Gore. The election was noteworthy, because the election’s outcome resulted from a difference of 527 votes between both candidates in the Florida elections, out of almost six million cast. A therefore mandatory recount of votes and the intervention of the U.S. Supreme Court uncovered irregularities in the voting process as an unusually large number of votes were declared invalid, because of two or no votes on

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Box 8.2 The Case for DRE Voting Machines (continued)

the ballot. Investigations yielded that large numbers of the problems on Election Day were caused by usability and ballot design issues of the voting systems. These were designed using a paper-based punched card system, by which voters choose by punching out a perforated circle next to each choice.

Florida made use of so-called “butterfly ballots,” where a single column of punch holes is located in the middle and the candidates’ names are listed on both sides. The underlying intention was to improve readability by having the advantage of a compact design. Voters had problems understanding the process of voting with the systems or were even unable to choose a candidate. Postelection analyses yielded an unusual number of overvotes, meaning that a voter selected more candidates than allowed, or undervotes, meaning that a voter selected fewer candidates than allowed. Voters stated that the ballot’s design made them believe they were allowed to vote for two candidates. Defects in the punch card system caused dimpled or not fully punched cards, which made the counting of votes difficult since the voter’s choice was not clearly stated. In the years following this election, Congress launched the initiative “Help America Vote Act,” which aimed at replacing punch card systems with touch-screen machines, training poll workers and educating voters.

Box 8.3 The Case Against DRE Voting Machines

In contrast to the United States where DREs were highly promoted after the 2000 presidential election, the German Federal Constitutional Court ruled out the use of voting machines in German elections which do not produce a paper trail. According to their verdict, voting systems have to ensure that all significant steps of the voting process can be validated without any special experience and that all voters are able to track whether their vote is recorded correctly. Thus, most DRE voting machines are not permitted in German elections and policy referenda.

8.2.3 What Are the Pro and Cons of Optical Scan Technology?

Another solution to speed up the tabulation process and save election costs is to use optical scan technology. Like DREs, optical scan technology is employed to save costs and produce immediate election results. In comparison to DRE voting machines, optical scan technology has two further advantages: paper ballots can be recounted if necessary and voting procedures do not need to be changed significantly. Unlike for DREs, accessibility to the voting process is not improved compared to paper-based voting.

There are two main types of optical scan voting machines – namely, one that uses optical mark recognition scanners to identify marks on the paper ballot in the tabulation process; and another that uses a digital voting pen on a specific paper ballot to check for validity, and count and aggregate votes (cf. Table 8.3). Although the results of the traditional paper ballot still form the legal basis of the voting outcome, errors caused by the tabulating program, the voting pen software, or the paper ballot can still cause undetected alteration of ICT-based generated outcome (cf. Box 8.4).

Despite these rather technical risks, there is also a psychological aspect to this discussion. The more complex the voting systems, the harder it is for constituents to assess their accuracy. In the end, voters have to rely on vendors' promise that these technologies work correctly. Best practices of successful elections which use optical scan technology can help to facilitate people's openness towards these technologies. An election official, who decides to replace paper-based voting systems with any mechanical or electronic voting machine, has to consider that the introduction is in many cases accompanied by controversial discussions which may in the end threaten the legitimacy of voting outcomes. In the last section, we will discuss why policy-makers make different trade-offs in the assessment of new voting technologies.

Box 8.4 Controversies Surrounding the Digital Voting Pen Used in the 2008 Hamburg State Election

In 2005, the city of Hamburg decided to introduce the so-called “digital voting pen” in order to replace the formerly used one-sided ballot sheets. A reformation of the state's election law was adopted due to the complicated and time-intensive counting of votes. The introduction of a digital voting pen was promising, because it would reduce the evaluation length from one week down to hours.

The digital electoral pen is used in the same way as a common pen. The voter chooses his/her candidate and marks his/her choice by making a cross right next to the candidate's name. The pen itself stores the corresponding position on the ballot. Afterwards, the voter drops the ballot into the voting box and inserts the pen into a docking station. The position data is then transferred to the voting system and afterwards deleted from the pen. Seen from a technical perspective, an optical mark recognition system contained inside the pen scans the voter's choice. The digitalization is enabled through a pattern on the ballot. When the pen touches the ballot, a sensor inside the pencil lead activates the optical scanner. The digital pen has the advantage that it accelerates the counting process while at the same time not deeply changing the voting process.

However, after public claims and a hearing of experts in 2007 the state parliament of Hamburg eventually cancelled its introduction. The reasons behind the decision included security issues and the inaccuracy of the digital

(continued)

Box 8.4 Controversies Surrounding the Digital Voting Pen Used in the 2008 Hamburg State Election (continued)

pen. Surveys found that even though the system's usability was accepted by the public, the distrust in the system was obvious. Nevertheless, the German Federal Office for Information Security declared it will continue the project and improve the digital voting pen in terms of security and reliability.

Summary

In summary, voting machines may increase the flexibility, convenience, and cost-effectiveness of voting procedures. However, in the rush to improve these requirements, DREs may also sacrifice the integrity, verifiability and auditability, reliability, and transparency of the voting system. DREs and optical scan technology represent the most commonly used ICT-based voting machines. The major problem with voting machines is the fact that most voting machines are proprietary and thus, vendors do not allow constituents to access the source code of the voting machine. While the optical scan technology produces a paper trail which forms the legal basis of the voting outcomes, only a manual recount can guarantee the accuracy of the results. In the end, constituents have to build trust in the technologies used in voting procedures in order to enable the integrity and the legitimacy of the outcome.

8.3 Internet Voting

8.3.1 What Is Internet Voting?

The voting machines introduced so far have focused on improvements in the polling place. However, voting machines do not necessarily solve the problem of decreasing participation in political decision-making processes due to barriers like increased mobility of modern societies, work schedules, physical immobility, and inconvenience. Rather, voting machines aim at saving costs and speeding up the tabulation process at the traditional polling place.

In order to allow everyone to participate in an election or policy referendum many countries permit, by way of exception, constituents to vote by mail. Internet voting can be seen as the electronic equivalent of voting by mail. We define internet voting as the use of the internet in voting procedures which mainly involves authentication, recording, storing, and tabulation of votes. Thereby, the internet can be used in all stages of the voting process between the voting authority and voter. In the following, we focus on a scenario where

voters cast their entire vote remotely from their home computer. While proponents may view internet voting as a tool to implement direct democracy, we believe that – for the reasons specified in the introductory section – internet voting is only an alternative for postal voting which is in most countries allowed only in exceptionally cases. We discuss in a later subsection how a transition to internet voting may be gradually realized.

8.3.2 Why Internet Voting?

Proponents of internet voting adduce four main reasons to boost the adoption and diffusion of internet voting (Buchstein 2001). First, internet voting increases the flexibility of voters as it allows them to cast their vote from their mobile device or home computer. The expectation of proponents is that this flexibility will also allow those constituents to cast their vote who are on holiday or have to work on Election Day, or those who are physically immobile. The assumption is that the introduction of internet voting will increase voter turnout. Second, internet voting may enable the implementation of more complex voting procedures which better convert voters' will into election outcome. In fact, considerable research has examined how the form of the ballot, the set of allowable votes, and the algorithm for determining the outcome effectively maps voters' intent into the election outcome. Internet voting may enable alternatives to existing systems. Third, internet voting can enable – desired or not – the deployment of more direct democratic elements in the political system. Besides legal aspects, high costs are one of the arguments why policy referenda are rarely carried out in the EU. These costs could be significantly reduced through internet voting. Finally, the use of internet voting involves significant time and resource savings for both voting authorities and voters by replacing costly postal voting through convenient online access to the virtual voting booth.

8.3.3 What Are the Concerns About Internet Voting?

Compared to paper-based voting, internet voting involves both a shift from voting at presence to remote voting and a shift from paper-based to ICT-based procedures (cf. Table 8.2). We will discuss concerns about internet voting with respect to these major shifts separately in the following.

The shift to remote voting faces three challenges which arise from the uncontrolled environment in which the vote is cast. First, a voter could be coerced into voting for a particular candidate. This would violate the secrecy and noncoercibility requirement of voting systems (cf. Table 8.1). For example, a patriarch could pressure members of his household to vote for a certain party. Second, voters could be influenced by political parties at the time of voting. In an online environment this is much harder to control. Vote solicitation is legally prohibited in most free, fair, and secret elections or policy referenda on Election Day. No party is allowed to promote its ideas around the electoral office. Third, remote voting gives

voters the opportunity to sell their votes to the highest bidder. Disenchanted citizens who are indifferent about election outcomes could offer their vote and easily prove that they have voted as requested by the highest bidder. In this respect, postal voting faces the same concerns as internet voting. For these reasons, most democratic electoral systems allow postal voting only in exceptionally cases.

Apart from general concerns about remote voting and concerns about inequalities regarding access to internet voting (cf. Chap. 3 The Digital Divide), internet voting leads to a variety of technical concerns. The internet is a global system of interconnected computer networks. Transporting votes is highly vulnerable. Compared to postal voting there is increased potential for security and privacy violations. For example, local power outages could cause disruption of the voting. Moreover, security failures are hard to detect and hard to recover from because of the anonymity requirement of voting systems. Security failures might be due to the internet or the voting server. However, security failures might also be due to trojans, viruses, and phishing on private computers. While one may argue that online voting is comparable to online financial transactions, on a closer look e-voting has much higher security requirements than e-commerce applications. For example, if a denial of service attack occurs, it implies for e-commerce that the business is lost or postponed. However, in e-voting this would imply that an eligible voter is unable to vote. This is a clear violation of the eligibility requirement of voting systems.

8.3.4 How Can a Transition to Internet Voting Be Realized?

After weighing up the benefits and concerns of internet voting, election administrators may decide to implement internet voting. Smith and Clark (2005) introduced an internet voting stage model which practitioners can use to gradually implement internet voting (cf. Fig. 8.1). With each stage, the complexity of the voting mechanism (with regard to authentication and security threats) and the flexibility for the voter increases.

In a first step on the path to internet voting, the voting system allows voters to cast a ballot via an electronic voting machine located at any traditional polling place. Voters are not restricted to one polling place but can also choose a polling place that is located remotely from their election district. This is convenient for those constituents who are on holiday or at a remote workplace on Election Day. Thereby, authentication of voters is done by election officials and ballots are transmitted for central tabulation using an encrypted internet connection. Thus, vote tabulation is the process which is moved to the internet as a first step.

Stage two has the same basic characteristics (authentication by officials and centralized tabulation) as stage one. As an extension, electronic voting machines are also deployed at selected government agencies where voters can cast their vote remotely well in advance of Election Day. At the same time, voters can still use any traditional polling places on Election Day to cast their vote. Thus, the enhancement in this stage is the increase in the number of polling places which also causes additional costs for running the election. Nevertheless, when convenience, secrecy,

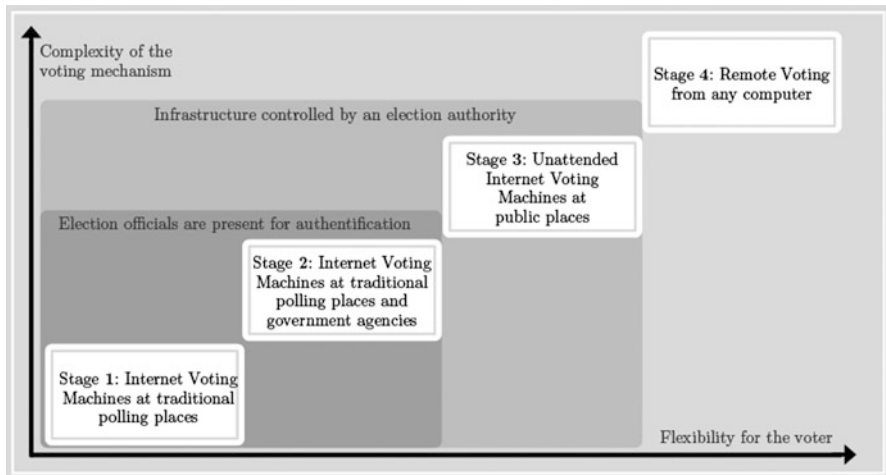


Fig. 8.1 Internet voting stage model (Based on Smith and Clark 2005)

and noncoercibility are major concerns, stage two might be the most promising way to use the internet to support the voting system.

While in stage one and two authentication is controlled by election officials, in stage three a vote authentication mechanism allows voters to cast a ballot at any public place where an internet voting machine is deployed. An electronic identification card can be used to authenticate the voter (cf. Chap. 4 Legal Aspects of Digital Service Delivery). The eligibility of the voter to cast a vote can be checked based on an encrypted internet connection to the election authority. As discussed before, unattended internet voting machines inherently bring with them risks of coerced votes, vote selling, or vote solicitation.

While infrastructure remains under the control of the election authority in the first three stages, stage four allows voters to cast their ballot from any computer connected to the internet. If the infrastructure is not controlled by an election authority, the likelihood of security failures increases significantly. Private computers are often unprotected against trojans, viruses, and phishing. Therefore, votes could be altered, eliminated, or even made available to the public.

Smith and Clark (2005, p. 513) conclude that “it may be years, if ever, before a truly secure, relatively risk-free internet service such as internet voting, is developed.”

Summary

Internet voting is a promising alternative to postal voting in elections or policy referenda. Internet voting is expected to reduce time and costs for voters and election authorities, allows the implementation of more complex

(continued)

Summary (continued)

voting procedures and enables – whether desired or not – the deployment of more direct democratic elements in the political system. However, the shift to remote voting and ICT-based voting technologies is accompanied by concerns about the integrity and legitimacy of voting outcomes. The internet voting model shows how election administrators can gradually increase the flexibility for voters by using internet-based voting technologies. Flexibility for the voter and potential barriers grow simultaneously in each stage. Offering additional polling places in advance of Election Day in government agencies involves additional costs. Unattended internet voting machines bring with them risks of coerced votes, vote selling, or vote solicitation. Finally, if the infrastructure (e.g., personal computer) is maintained by voters, the potential for security failures increases significantly.

8.4 E-Voting in Practice

8.4.1 Why Administrators Tend to Implement E-Voting?

Given the benefits and concerns associated with e-voting, there are different explanations as to why electoral authorities decide differently to what extent ICT is used to support the voting process (Buchstein 2001; Krimmer 2008; Moynihan 2004). The first explanation is based on cultural differences between electoral authorities. International e-government benchmarking reports (cf. introductory chapter) show that there are different outcomes of ICT-driven public sector reforms. While public agencies in the United States tend to have a stronger faith in technology, valuing technology and its benefits, and offer a great number of public services online, German administrations may be less confident of the effectiveness of digital government to reform the public administration. While the United States had already used ICT-based voting machines in the 1970s, the attempt to introduce a voting machine in Germany caused significant controversy (cf. Box 8.4). These national cultural differences are also manifested in electoral jurisdictions which outlaw the use of voting machines without a paper trail (cf. Box 8.3). In fact, in many countries the introduction of internet voting would be even accompanied by an amendment of the constitution (Krimmer 2008).

Given the risks associated with internet voting, a second explanation is based on decision-makers' risk perceptions (Moynihan 2004). ICT-based voting machines are typically developed and operated by private vendors. Therefore, election authorities are unable to make informed decisions as the true qualities of the vendor's software are hardly assessable. Election authorities can clearly formulate the requirements of the voting machine but are unable to fully verify whether these requirements are fulfilled or not. Relying on the claim that failures will also have

existential consequences for vendors may mitigate the security concerns of decision-makers. However, adopting ICT-based voting machines remains a risky endeavor.

Finally, the adoption of e-voting may also be driven by the politico-economic goals of decision-makers. The introduction of a functioning internet voting process is certainly a prestigious win for the technical capabilities of a country.

The sites for the production of new voting technologies compete with each other, politicians and managers are actuated by the hope that the country or the company that has the first fully functioning e-voting system will achieve a competitive edge, which will lead to significant export and sales. (translated from German, Buchstein 2001, p. 149)

In fact, a review of e-voting projects suggests a resistance to engaging companies from foreign countries and uncovers a market that is mainly controlled by four large providers that gained a competitive edge at the beginning of the e-voting era (Krimmer 2008).

8.4.2 What Is a Best Practice?

Box 8.5 First Internet Election in Estonia

In 2007, Estonia became the first country to use internet voting in its nationwide parliamentary elections. The e-voting system had been under development since 2002 and was first used for local elections in 2005. The project's success is outstanding: in the parliamentary elections in 2011, 24.3 % of all votes were cast electronically, compared to 3.2 % in 2007. Originally, the project's goal was not to replace the existing voting system, but rather to provide a supplement and increase participation. To vote electronically, the system requires a national ID card, which includes a chip storing information about the particular citizen. The national ID card is a mandatory identification document in Estonia. Before the election, voters are provided with two sets of Personal Identification Numbers for authentication purposes during the voting process. Moreover, a special card reader is necessary in order to cast a vote. The online voting channel is available 7 days prior to the election period. After authentication, the system provides a list of candidates and parties, from which voters can make their choice. From the technical point of view, the vote is then encrypted and stored on a remote system; personal information is stripped off the data before this transfer. However, it is still possible to vote by paper on Election Day and therefore to overrule the vote cast online.

Critics state that the voting and counting procedure can be manipulated on both client and server side. In their 2011 report, the OSCE (Organization for Security and Cooperation in Europe) declared minor concerns regarding the

(continued)

Box 8.5 First Internet Election in Estonia (continued)

technical concept of the Estonian e-voting system. Current efforts in terms of improvement of the system are concentrating on security issues and on increasing awareness of the e-voting system in general.

Summary

Decision-makers make different trade-offs with respect to the risks and benefits associated with internet voting. These differences can be mainly explained through cultural differences (faith in technology), different constitutional constraints (i.e., internet voting or use of voting machines without a paper trail are not permitted), varying perceptions of software quality, and the varying ambitions of politicians to boost the economy of local voting technology. In 2007 Estonia held its and the world's first national and legally binding parliamentary election which could serve as a model for future electoral revolutions.

Chapter Summary

Automated voting machines have been around for more than 100 years. Among the first voting technologies were lever machines and punch card systems. The advent of ICT enables innovations in the recording, storing, and tabulating of votes. Despite the many benefits like cost savings, instant results, and increased convenience for voters, many concerns threaten the integrity of ICT-based voting systems. DREs lack accuracy. Optical scan technology cannot guarantee that tabulation is carried out correctly. Internet voting faces challenges caused by the remote channel (coercibility, vote selling, and vote solicitation) or the use of the internet (digital divide, security failures). Given the risks and benefits, decision-makers make different trade-offs in the implementation of e-voting. Some reject internet voting for legal (violates the constitution) or cultural reasons (lack of faith in technology). Those who at the end decide to implement e-voting in important elections or policy-referenda need to be aware that its introduction is accompanied by controversial discussions which may threaten the legitimacy of the outcome and the voting system as a whole.

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Abstract

E-participation is a term describing the utilization of ICT to enable citizens to participate in political decision-making processes. In this chapter, we first introduce the political decision-making process as the underlying framework for identifying the role of ICT in modern politics. Then, we outline the role played by ICT in the political decision-making process and the potential of ICT. Furthermore, we describe typical difficulties when implementing E-participation initiatives, concluding with a section on costs of such initiatives. In this regard, we introduce the E-participation balanced scorecard, which is a tool to align the political and direct democratic potential of a concrete initiative with the costs associated with its application.

Learning Objectives

Introduction

- What is e-participation?
- What is the political decision-making process?
- What is citizen participation?

E-Participation Framework

- What level of detail, or how far to engage citizens?
- When to engage?
- Who should be engaged and by whom?
- How and with what to engage?
- How can you systemize e-participation initiatives?

Implementation of E-Participation Initiatives

- How can e-participation initiatives be implemented?
- How can the effect of e-participation initiatives be evaluated?

9.1 Introduction

9.1.1 What Is E-Participation?

Growing disenchantment with politics is certainly engendered by a lack of transparency and accountability of the political institutions and actors. This is particularly the case at the state, federal, and European level. On the one hand, representatives often pass over citizens' concerns and do not incorporate the interests of the various citizen groups in decision-making. On the other hand, citizens are disenchanting with certain political outcomes because representatives do not give a good explanation for their actions and citizens feel that their representative acts in party instead of constituent interest. As the internet provides new opportunities to express and exchange perspectives, optimists see in E-participation new prospects to improve the relationship between representatives and represented.

The term E-participation denominates the use of ICT to engage citizens in the political decision-making process.

9.1.2 What Is the Political Decision-Making Process?

Political scientists have developed a variety of models to provide us with a framework for systematic analysis of politics and policy-making. These models might also be helpful for our understanding of E-participation. Easton (1965) was one of the pioneers of model development for policy-making. According to his model, the political system is a process which transforms various inputs into outputs (see Fig. 9.1).

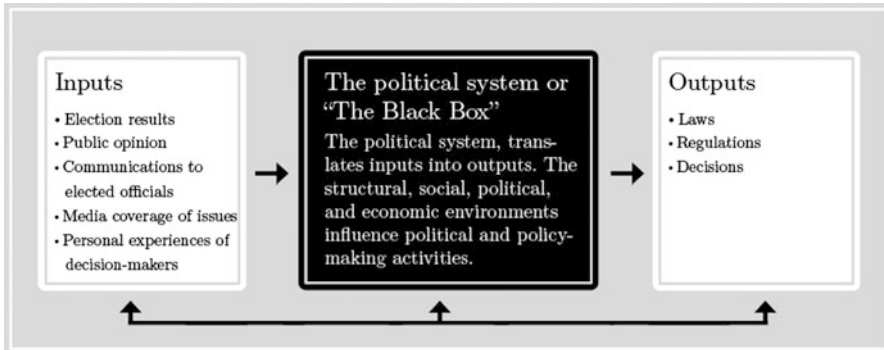


Fig. 9.1 A system model of politics and policy (Birkland 2001)

As argued by Birkland (2001), the “inputs to the policy-making system are the demands placed on the system to do something about the problem.” The most obvious form of input to the political system is voting. Policy makers often claim the result of an election as a mandate to pursue particular policies. Moreover, in countries like Switzerland where the political system includes direct democratic elements, people are allowed to directly vote on certain policy proposals. Apart from these direct participatory elements, letters, post cards, or personal meetings are ways for citizens to express their wishes to their representatives. Other inputs include the activities of interest groups, parties, media, lobbyists, unions of municipalities, and so on.

The political process that transforms these inputs into outputs influences or is influenced by its structural, social, economic, and political environment. The structural environment includes the constitutional framework of policy-making such as the division of power among branches (executive, legislative, and judiciary) and levels of government (federal and state level) as well as the role of the media. Moreover, the structure of the party system organizes political actors. Although members of parliament are allowed to act independently in the interest of constituents, representatives are often limited to do so by the political program of the party they belong to.

Finally, the political environment describes the relationships between citizens and their government. This includes how citizens feel about and trust their government but also their general readiness and attitude to an issue. The political environment also comprises political values that are widely shared among electorates. In a country like France, where people believe in strong worker rights, a policy initiative which strengthens employer’s rights will be harder to adopt than in a country like the United States where free enterprise and market capitalism are key features of the political culture.

While the political system is treated by Easton (1965) as a black box in which transformational processes remain unexplained, Birkland (2001) argues that the challenge in thinking about policy-making is not in the specification of inputs and outputs. Rather, the question is how inputs are transformed into outputs. As a result,

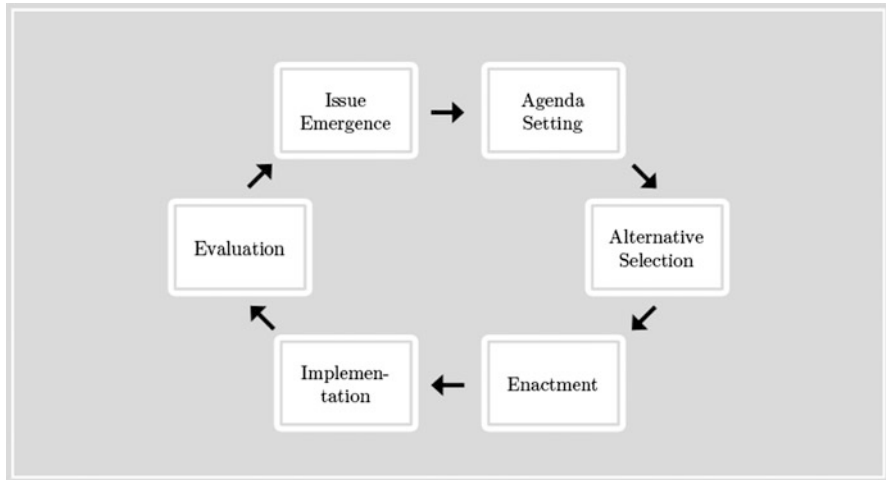


Fig. 9.2 Political decision-making process

he presents a simple model in which the policy process traverses six steps (see Fig. 9.2). Although this model is a strong abstraction of the policy process and implies that policy-making always traverses each step, it helps to structure our thinking about E-participation.

“Issue emergence” refers to the point at which an issue becomes visible and important to citizens, policy makers, or interest groups. Typically issues emerge when national policies seek local implementation or when the public administration has evaluated that a current policy no longer works according to initial assumptions. “Agenda setting” refers to the process by which a set of issues that could potentially attract the attention of politicians is narrowed and focused to a list of subjects politicians actually pay attention to. The opportunity to set an issue on the list is typically provided when “solutions become joined to problems, and both of them are joined to favorable political forces (Kingdon 2002, p. 204).”

The process of “alternative selection” narrows the set of possible alternatives to that set from which choices are actually made. These alternatives and proposals are typically generated by groups of academics, consultants, career bureaucrats etc. Through speeches, leaks to the press or other conversations to constituents, politicians typically test these ideas and proposals. After different policy alternatives are created and analyzed, one alternative is selected on which representatives or constituents decide.

The problem and the solution are then introduced into the parliamentary process, mostly as a proposal of the government. Associations, interest groups, or unions are then invited to comment on the parliamentary initiative. At the end of this procedure a legal action is usually decided (e.g., an amendment to a law) mostly based on a majority decision. After this, the problem is considered to be settled and for this specific political issue peace is established, even if unsuccessful minorities may still wrestle with their fate.

Next, the task of the public administration is to implement and put the legal amendment to work. Finally, the public administration has to monitor the policy in relation to whether it is working according to the initial assumptions or whether changes in the policy are necessary. In the latter case, the policy-making process starts all over again.

The stages of the political process in Fig. 9.2 are connected to political institutions. “Issue emergence” is usually done outside a political institution, for example through a speech or a motion from interest groups. “Agenda setting” may be documented in the policy statement of a party or of a government, for example when a new government is elected and publishes its declaration of objectives for the next parliamentary period. “Alternative selection” is typically a process intended for formal parliamentary or governmental hearings that usually end with a decision of the government and the parliament. “Implementation” is the administration’s task, whereas “Evaluation” may be carried out by political actors or public officials.

The political decision-making process of Fig. 9.2 may work differently in two particular nations even if the formal institutions are similar. The difference stems from the way politicians and citizens actually bring life to the debate. Some societies debate political issues mostly in the media, others mostly in interest groups with little or no media coverage. Some politicians bring the political problems to their electorate through local meetings and actions. In other nations the same political issue is mostly handled by press announcements and speeches of the central government. These national differences of “living democracy” become visible whenever a new European contract is negotiated.

9.1.3 What Is Citizen Participation?

The question we would like to address in this section is what citizen participation actually is and amongst which forms of citizen participation we can differentiate. While political representatives at the local level can more easily integrate citizens in decision-making, political processes at the federal level are often apart from citizens’ concerns. A remarkable article addressing this issue was published by Arnstein in 1969 who defined citizen participation as a categorical term for citizen power. When Arnstein wrote the article, demographic groups with an immigrant background were mainly isolated from politics and she postulated a redistribution of political power to take control of local or neighborhood politics.

[Citizen participation] is the redistribution of power that enables the have-not citizens, presently excluded from the political and economic processes, to be deliberately included in the future. It is the strategy by which the have-nots join in determining how information is shared, goals and policies are set, tax resources are allocated, programs are operated, and benefits like contracts and patronage are parceled out. In short, it is the means by which they can induce significant social reform which enables them to share in the benefits of the affluent society. (Arnstein 1969)

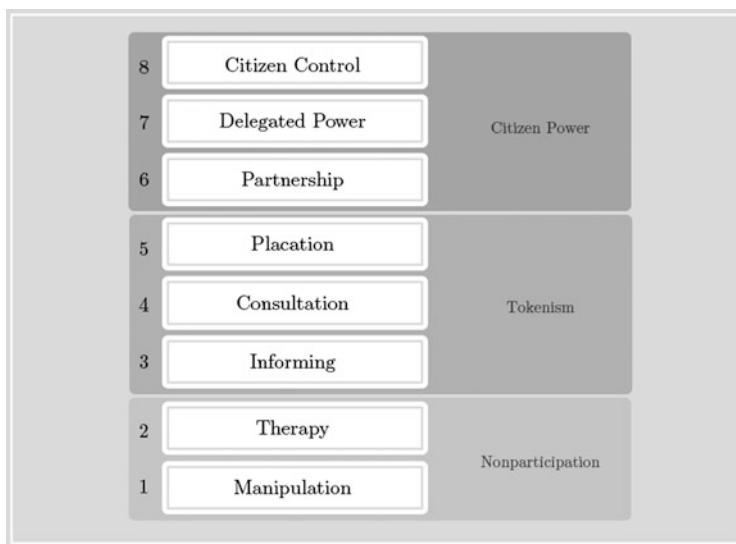


Fig. 9.3 Arnstein's eight levels of citizen participation

Arnstein (1969) introduced an eight-level typology of participation which may also help us in analyzing the extent of citizen power in political decision-making (see Fig. 9.3). “Manipulation” and “Therapy” describe levels of “nonparticipation” where representatives contact citizens in the name of participation to “educate” or “cure” them.

“Manipulation” is involved when participation is distorted into a public relations vehicle of power holders. In doing so, citizens are contacted in order to engineer their support. At virtual or physical meetings, officials persuade or advise citizens, not the reverse. Masked as citizen participation, therapeutic activities (“Therapy”) use tenant groups as vehicles for promoting things like control-your-child or cleanup campaigns. In such cases, representatives try to cure citizen’s incapability assuming that powerlessness is synonymous with mental illness. “Therapy” is invidious as it engages citizens in extensive activity, but the focus of it is on curing them rather than changing what created their incapability.

“Information,” “Consultation,” and “Placation” describe levels of tokenism in which citizens are informed and heard by decision-makers. Nevertheless, tokenism does not ensure that power holders take their ideas and interests into account. Informing citizens about their rights, opinions, and responsibilities is the first step towards real citizen participation. However, “Information” alone is only a one-way communication in which no reverse channel is provided for citizens to frame their opinion. In contrast, “Consultation” encourages citizens to express their opinions and concerns to power holders. Although it is an important step towards real citizen participation, in many cases representatives use these views only if they are in accordance with their own or parties’ interests. Otherwise, they are discarded or dismissed as nonsense. “Placation” is simply a higher form of tokenism in

which citizens can directly advise power holders and actively engage in decision boards but can still be overruled by power holders. For example, a citizen group is allocated a small number of seats in a decision board. In that case, power holders can still outvote and circumvent the minority group.

“Citizen Power” begins when citizens have a direct say in planning and decision-making. “Partnership” is a form of citizen participation in which politicians and citizens work together jointly. Collaboration is hereby governed by a structure which has been established beforehand. The governance structure can also assume a shape where citizens have the dominating role in decision-making. “Delegated Power” is a situation where citizens hold decision-making power and are accountable for the program and decisions taken. In this stage, citizens take direct control over designing a political program or implementing a policy. However, “Delegated Power” implicates that citizens cannot decide in a totally independent fashion. Power-holders may still decide on funding or keep the power of veto to intervene if the political program or decisions taken are not in conformity with the power holder’s goals. In contrast, “Citizen Control” excludes such external influences and ensures that policy and managerial aspects are fully controlled by citizens. If power-holders want to reclaim decision-making, they have to negotiate with empowered citizens.

Summary

Birkland’s model and Arnstein’s ladder show two different views on citizens’ participation in public policy processes. Birkland identifies the different stages of political decision-making. The decision-making process diagram shows the different stages a political topic can be in. On the basis of these stages, citizens’ engagement can be manifold. On the one hand, the sheer number of people and the lack of interest in many political questions then determine to what point the participation of citizens in the decision-making process is possible. On the other hand the will of the leaders to engage citizens in the decision-making process determines the quality and quantity of participation as well. Arnstein’s ladder can be used as a simple framework to classify citizen participation into eight stages. Digital media may have a major impact on the way participation is carried out in practice. Hence, E-participation carries the potential to mitigate at least the aspects of aggregation of mass opinion building and the lack of cost-efficient communication channels. However, care must be taken when installing new participatory channels. The danger is that by not thinking through methodologies up-front, the potential for increased participation is not lifted.

Table 9.1 Key dimension of E-participation initiatives (Macintosh 2004)

Dimension	Description
Level of participation	What level of detail, or how far to engage citizens
Stage in decision-making	When to engage
Actors	Who should be engaged and by whom
Technologies used	How and with what to engage

9.2 E-Participation Framework

9.2.1 What Level of Detail, or How Far to Engage Citizens?

The **level of participation** dimension describes the degree to which citizens are engaged in policy-making (see Table 9.1). Power redistribution has in fact its limitations in representative democracies. Participation is no replacement for principles of representative democracy such as free and fair elections and representative assemblies. If we take Arnstein's (1969) ladder of citizen participation into account, governments within representative democracies consider tokenism as the only compliant way to allow citizens to participate in political decisions. The Organization for Economic Co-operation and Development (OECD) distinguishes three stages of e-participation, namely "Information," "Consultation," and "Active Participation." "Information" describes a tool that deploys a one-way relationship in which government produces and delivers information for use by involved actors. "Consultation" characterizes a two-way relationship in which political actors provide feedback to government. Governments define the issues for consultation, set the questions and manage the process, while involved actors are invited to contribute their views and opinions. In turn, "Active participation" describes a relationship in which actors actively engage in defining the process and content of policy-making. It acknowledges equal standing for actors in setting the agenda, proposing policy options and shaping the policy dialogue –although the responsibility for the final decision or policy formulation rests with government.

9.2.2 When to Engage?

The stage in decision-making describes in which stage of the policy-making process the initiative actually employs participation.

An E-participation initiative can cover more than one stage of decision-making or can even escort the whole policy-making lifecycle.

9.2.3 Who Should Be Engaged and by Whom?

As discussed before, the decision-making stages are connected with different actors and institutions. Therefore, the actor dimension describes who is engaged by whom. Typically, parties, members of parliament, or the public administration provide citizens, interest groups, or experts with information or invite them to express their views and opinions.

9.2.4 How and with What to Engage?

The means to engage citizens and support participation are described by the technology used dimension. An overview of E-participation tools is provided in Table 9.2. Along Arnstein's ladder, these tools can be categorized in different dimensions. Where webcasts, frequently asked questions, and blogs are located in the category of nonparticipation, opinion polls, chat rooms, and discussion forums can be put into the level of tokenism. In these forms of technology-supported participation, opinions are expressed without the necessity to take these on in decision processes.

9.2.5 How Can You Systemize E-Participation Initiatives?

There are several dimensions that can help us to identify types of E-participation initiatives. E-participation initiatives can be systemized according to the dimensions outlined in Table 9.1 – “level of participation,” “stage in decision-making,” “actors,” and “technology used.” In order to successfully implement and enact E-participation initiatives, it is of high relevance to answer these questions before becoming engaged in the implementation process. Along with these questions, economic aspects also have to be considered. We will highlight the economic assessment of E-participation initiatives in the following sections.

Summary

The E-participation framework is a tool to structure the approach to evaluate, substantiate, and implement E-participation initiatives. It describes a normative concept in order to determine to what point citizens are to be integrated into decision-making processes and which media to use for which participatory initiative. On the basis of this framework, authors like McIntosh have proposed structuring concepts in order to give decision-makers a tool to evaluate E-participation initiatives and determine which instrument to use for what kind of political decision situation.

Table 9.2 E-participation tools (Macintosh 2004)

Type of tool	Description
Webcast	Real-time recordings of meetings transmitted over the internet
Frequently asked questions (FAQ)	FAQ is a “tree” of questions and answers that can be searched using keywords or by inputting a question or statement in “natural language.” The tree can be explored or searched to find answers that are closest to the user’s questions
Blog	Blogs are frequently modified web pages that look like a diary as dated entries are listed in reverse chronological order
Opinion poll	Opinion polls are web-based instant surveys
Chat room	A chat room is a virtual space where a chat session takes place in real time
Discussion forum	A discussion forum is a website for an online discussion group where users, usually with common interests, can exchange open messages. It typically shows a list of topics people are concerned about. Users can pick a topic and see a “thread” of messages and replies then post their own message
Panel	A panel represents a recruited set, as opposed to a self-selected set, of participants who have agreed to give their views on a variety of issues using ICT at specific intervals over a period of time
Petitioning	Petitioning is a web-based system that hosts online petitions and allows others to sign up to them by adding their name and address online
Virtual community	A virtual community is an online space in which users with a shared interest can gather to communicate and build relationships
Alert service	An alert service is a one-way communication alert to inform people of a news item or an event, such as, for example, a new consultation

9.3 Implementation of E-Participation Initiatives

9.3.1 How Can E-Participation Initiatives Be Implemented?

E-participation initiatives take effect along the political decision-making process. This process consists of five stages (cp. Fig. 9.4).

Phang and Kankanhalli (2008) propose a framework of ICT exploitation for E-participation initiatives. In their framework, they propose a three-stage procedure for ICT utilization in E-participation efforts.

- The first stage: “Identify Objective to be served by E-participation.”
- The second stage: “Select best-matching participatory techniques.”
- The last stage: “Select ICT tools that can support the participatory technique and, in turn, the objective.”

In light of these three stages, different E-participation objectives can be applied in different phases of policy-making. During the phases of “issue emergence” and “agenda setting,” digital infrastructures can be used for input probing. In the “alternative selection” phase, information exchange and decision-making supplement can be supported by digital media. During “implementation” and “enactment,” education and support building stand in the foreground. In the last phase, the “evaluation,” information exchange among stakeholders can be facilitated.

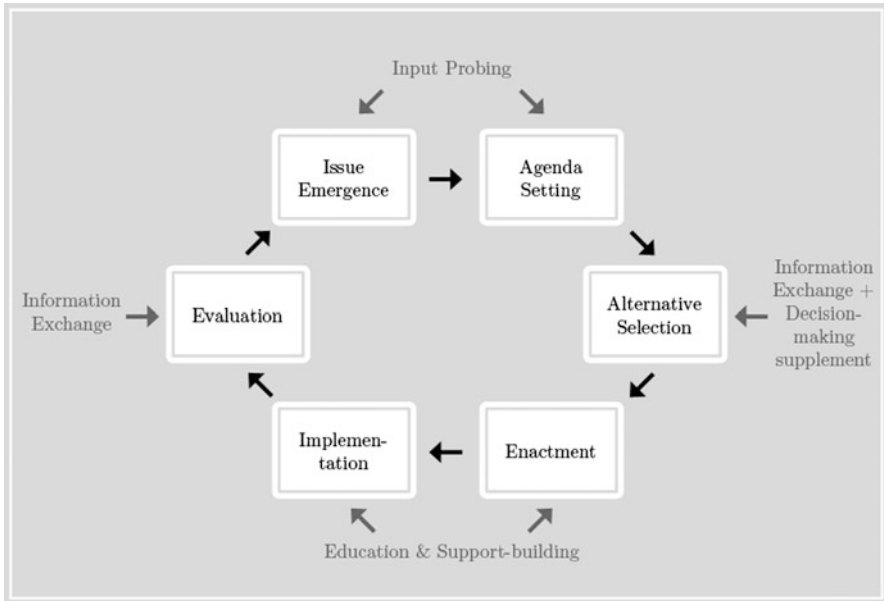


Fig. 9.4 Six stages of the political decision-making process and ICT impact

Applying these different approaches of using digital media to support E-participation initiatives, information exchange is applied to foster communication and discourse between policy planners and citizens as well as among citizens in the “evaluation” phase. In meeting this objective, drop-in centers as well as public hearings are applied as participatory techniques. Drop-in centers are locations where citizens and planners can interact. Public hearings are open forums where an interested public can hear agency proposals and respond to them. When considering whether to support this process, web portals can act as online drop-in center where interested citizens can obtain information. Online discussion forums and online chat rooms can serve as a virtual meeting place where planners and citizens can interact. However, it is of central importance to perceive the transfer of participation from personal interaction to a web platform as a change management process. Many cases have shown that online participation platforms in the past have not been accepted to the degree they should be in order to substitute face-to-face public hearings. A successful example of an online portal supporting this phase of policy-making is the REACH Portal which was established in Singapore in October 2006.¹ This forum is used to gather and gauge ground sentiments from citizens. It includes a number of current media including Twitter, Facebook, Youtube and many more in order to reach out and engage citizens. It promotes active citizenry through citizen participation and involvement. Workgroups develop ideas based on the postings and support concrete participation elements to create proposals for the government’s consideration.

¹ <http://www.reach.gov.sg/YourSay/DiscussionForum/> (Accessed 11th of November 2011).

Having concrete proposals in place, decision-making is the next step. Using digital media to support this phase in policy-making, decision-making supplement is a way to move forward. Here, the extraction of specific information from citizens as well as their opinions on the choice of alternatives stands in the foreground. Participatory techniques applied in this phase include nominal group process, that is a step-by-step process ending in ranked recommendations. Another procedure is value analysis. Here, ranked consequences of various proposals are produced. The ICT tools that can support these techniques should provide control over how the process of participation occurs. In other words group support systems with process restrictiveness can be designed to incorporate an agenda of anonymous idea generation on a given topic, followed by a discussion to elucidate the underlying assumptions and rationales of the ideas and ending with a cycle of anonymous voting reaching consensus.

In the phase of implementation and enactment, education and support building are the key objectives of using digital media in participation. Here, the objective is to inform citizens about the why and how of government's policy plans and to create a favorable climate for execution of said plans. The participatory techniques applied in this phase include citizen advisory boards, that is groups of citizens who formally are attached to an agency. Also citizen panels can be used, which are groups of citizens (e.g., nongovernmental organizations, NGO's) selected for consultation on a specific policy plan. ICT can be used here to facilitate the selection of target participants and to maintain contact with them over a period of time. The first step can be to select citizens based on electronic profiling of demographic information (e.g., age, profession, and area of residence) in online communities. Then, contact can be maintained via video and teleconferencing tools. An example for this interaction phase is the citizen's panel of the city of Bristol. Bristol City Council² was one of the first councils in the United Kingdom to set up a citizen's panel in 1998. Citizens are selected for a 3-year period and then replaced by new citizens in order to keep the panel "fresh." The council and its partners, for example NHS Bristol, the police force, and the local Bristol partnership ask questions to inform decisions and service improvements. Citizens, who are members of the council, complete three questionnaires online or on paper per year. Panel responses are compiled in a report to inform decision-makers of public opinion. Citizens receive an e-mail newsletter with the results of the questionnaire and how said results are being used to influence policy-making.

Finally, input probing is used in the phases issue emergence and agenda setting. The general idea of input probing is to obtain citizens' views on relatively under-explored policy issues; for example, before building the very first casino in a country or engaging in major multibillion construction projects. Here, participatory techniques can include online citizen surveys, providing well-developed methodologies and procedures for data collection and analysis. ICT can facilitate

² <http://www.bristol.gov.uk/page/citizen-panel> (Accessed 11th of November 2011).

this process and should limit the interactions among citizens so that noise and information bias can be minimized. Online questionnaires, online opinion polls, and data analysis tools like SPSS can facilitate systematic analysis of the inputs (Table 9.3).

9.3.2 How Can the Effect of E-Participation Initiatives Be Evaluated?

Having discussed possible participatory initiatives and sociotechnical approaches to E-participation, the question remains how such initiatives may be evaluated. From the point of view of strengthening democracy, any token of participation is important and should be encouraged to happen. However, since there are limited resources in terms of time and financial funds, a balance between the investment and the effectiveness of E-participation initiatives has to be found. Generally speaking there is an imbalance between the amounts of time, financial commitments and energy governments spend on including citizens in decision-making processes and the attention of government in the evaluation of the efficiency and effectiveness of these efforts.

Hence, the question remains: How does one evaluate government E-participation initiatives that aim to improve citizen engagement in the political decision-making process? A 2009 evaluation of the E-participation initiatives in Europe including their title, short description, web address, participation areas, participation level, country, languages, funding types, start and ending dates and contact details showed that the majority of initiatives are aimed at information provisioning and are carried out at European and regional level. The second and third largest stakes of participatory initiatives were aimed at consultation and deliberation and took place at national, regional, and local level. Digital voting, polling, and collaborative actions including citizens' opinions were shown to be under developed. Also, the national government level seems to be less active than both local/regional level and European level in launching E-participation initiatives.

Macintosh and Whyte (2008) propose a framework for E-participation evaluation. They conceptualize three overlapping dimensions which are determined by "democratic criteria," "project criteria," and "sociotechnical criteria" (cp. Fig. 9.5). Democratic criteria include the anticipated impact of the project on democracy. Project criteria focus on the stockholders' aims, methods, and expectations of public engagement, and the sociotechnical criteria aim at public take-up, usefulness, and acceptability of the E-participation initiative. For each of the dimensions, specific targets are defined, for example representation, engaging with a wider audience, or accessibility. The targets can vary and are defined based on an individual project level. In each initiative, different actors may be targeted. Different standard methods are used to measure the status of the targets, for example semistructured interviews, field tests, questionnaires, or web server log analysis.

The targets for the different dimensions are the following: For the "democracy" dimension the targets representation, engagement, transparency, conflict and

Table 9.3 Participatory techniques for citizen engagement (Based on Phang and Kankanhalli 2008)

	Information exchange	Education and support-building	Decision-making supplement	Input probing
Examples of best-fitting participatory techniques	Drop-in center, Public hearing	Citizen advisory committee, Citizen panel	Nominal group process, value analysis	Citizen survey
Restriction on number and target of participants	No	Yes	Yes	Depends on sample size and resources available
Control of participation process	No	No	Yes	No
Maintenance of long-term contact	No	Yes	No	No
Interaction among planners and participants	Yes	Yes	Limited (mainly one direction)	No
Mechanisms for data collection	No	No	Yes	Yes
Statistical analysis of data	No	No	No	Yes
ICT tools that provide the features desired	e.g. Web portal with Online discussion forum	e.g. electronic profiling , Discussion forum with login feature, Teleconferencing	e.g. group support systems with process restrictiveness feature, Online pair-wise survey	e.g. online survey questionnaire , Web comment form, Data analysis tools

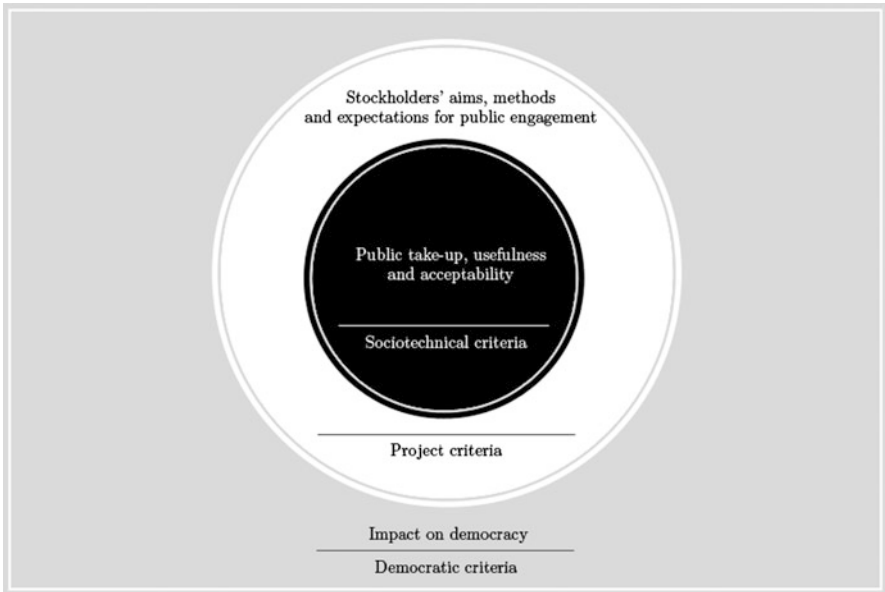


Fig. 9.5 Three overlapping criteria dimensions of E-participation (Based on Macintosh and Whyte 2008)

consensus, political equality, and community control are evaluated. For the “project” dimension engaging with a wider audience, obtaining better informed opinions, enabling more in-depth consultation, cost-effective analysis of contributions and providing feedback to citizens on their contributions are evaluated. For the “sociotechnical” dimension trust and security, relevance and legitimacy, accessibility, appeal, content clarity, responsiveness, navigation and organization, efficiency and flexibility, and error recovery are evaluated.

While the approach by Macintosh and Whyte creates an overview of the effectiveness of an E-participation initiative, the cost perspective is neglected. Hence Veit and Trenz (2010) propose a framework that is based on the well-known balanced scorecard by Kaplan and Norton (1992). The E-participation balanced scorecard is based on both, adopted aspects proposed by Macintosh and Whyte as well as the Kaplan and Norton balanced scorecard. It combines both approaches by including a cost perspective for E-participation initiatives (compare Fig. 9.6).

Generalizing some results from applying these concepts in practice, it can be noted that the application of the digital channel seems not meaningful in all cases.

Figure 9.7 shows that the number of judged participants directly determines the channel that should be chosen for the participatory project.

Table 9.4 shows the application of the E-participation balanced scorecard approach in a web-based discussion about the construction of a new public swimming pool area.

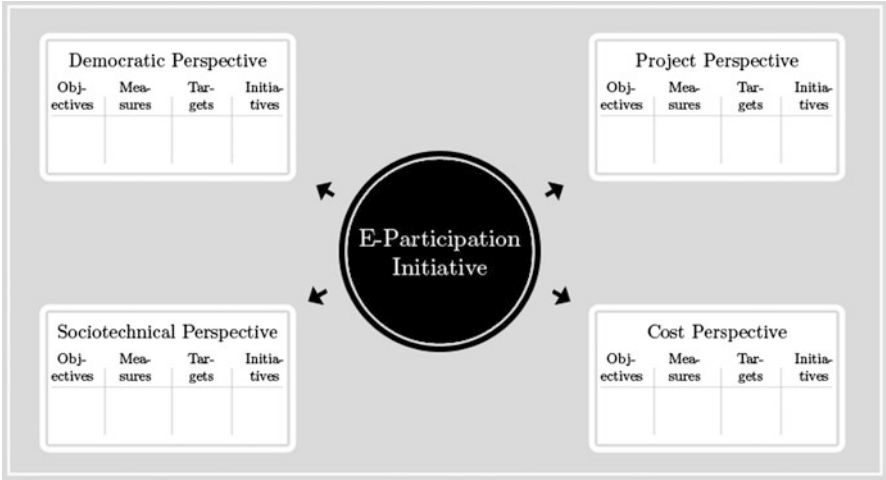


Fig. 9.6 The E-participation balanced scorecard (Based on Veit and Trenz 2010)

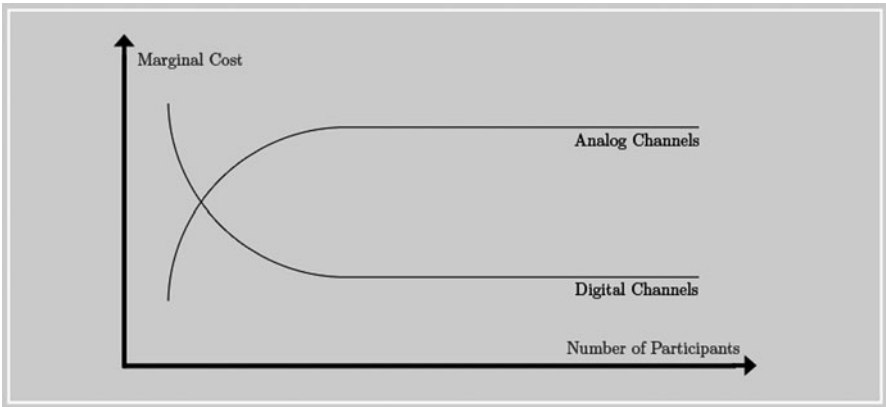


Fig. 9.7 Marginal costs in digital and analog channel contrasted (After Andersen et al. 2007)

Table 9.4 Application of the E-participation balanced scorecard

Dimension	Objective	Measure	Target	Initiative
Democratic	Transparency	Number of unique participants	50	Advertisement campaign
Project	Engaging a wide audience	Number of participants	100	Advertisement campaign
Sociotechn.	Appeal	User satisfaction	80 %	Provide feedback form
Cost	Support budget	Working hours in support	50 h/month	Provide a FAQ

Several implications can be drawn from an assessment of the balanced scorecard approach to E-participation solutions. First, it enforces a structured planning approach in regard to the objectives and the associated measures and initiatives. Hence, it enables a congruency between these determinants. Second, the relationships between the different objectives are identified. While in many ad-hoc approaches to E-participation initiatives these are largely underestimated, using the balanced scorecard approach an integration of these mutual influences is identified and up-front modeled. Furthermore, pseudo-objectives which cannot be measured are identified *ex ante* and can be eliminated from the project's goals. Of course, the balanced scorecard approach implies a substantial effort in planning and hence creates additional costs for the E-participation initiative. However, it ensures a much higher probability of success for the concrete endeavor.

Summary

The implementation of E-participation initiatives is a major decision to take and the decision-makers are faced with many insecurities. Hence, several authors proposed concrete steps along the political decision-making process in which ICT can play a decisive role in shaping this process. Furthermore, alongside ICT influencing political agenda setting and decision-making through its all-encompassing nature, these initiatives of course have to be evaluated up-front. Hence, the E-participation balanced scorecards and a number of other tools have been proposed in order to identify the utility of E-participation initiatives with respect to their contribution to decision quality improvement. Next to democratic decision quality, also costs play a major role. The costs for an initiative have to be balanced with its effect on strengthening direct democratic involvement of citizens.

Chapter Summary

The aim of this chapter is to outline the most important aspects of E-participation initiatives. First, we introduced the political decision-making process and the influence E-participation can have on it. Then, we delineated the decision-making process into its individual components and illustrated the role ICT has taken in modeling the different stages. Furthermore, we raised the point that there is a cost perspective to E-participation initiatives. Hence, we introduced the concept of an E-participation balanced scorecard in order to align the improvement of democratic processes with the perspective of costs. Finally, we outlined a rule of thumb as to when to use digital media for participatory initiatives and when to use traditional, paper-based media. This decision is largely influenced by the question of the number of expected participants in the participatory initiative.

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This textbook aims to equip the reader with a fundamental understanding of how information and communication technology (ICT) is influencing the processes of managing and leading political institutions and administrations in the digital era. In times of social media, the internet and all-encompassing digitized communication channels, designing and conducting political agendas has changed fundamentally.

In the introduction, digital government is introduced. We start by analyzing how the role of ICT in governments has changed over the past decades from being a support function in offices to a tool of daily political opinion making and agenda setting. We therefore define the term government based on a western, democratic understanding of modern institutionalism. Furthermore, we differentiate the particularities of government organizations and contrast these with the properties of nongovernmental institutions (NGO's) and especially the private sector. On the basis of this evaluation we outline, why concepts from e-business might be perceived as role models due to their innovation enforcement nature. However, we clearly conclude that it is short-fetched to simply try to transfer findings from e-business to digital government management. Next, we identify how digital media can transform the relationship of governments and society. Thereby, we strongly emphasize the transformative nature of ICT and outline what today is understood under the term digital government. In this, we differentiate the participatory and the managerial approach and conclude on how digital governments are evolving and how different theories and initiatives in practice draw upon digital media.

The objective of the second chapter is to outline the impact of digital governments. First, the core question is, which role does the internet play in digital governments and what are the main areas of government being affected by digitization. Therefore, fundamental terms such as the idea of direct democracy versus representative democracy are introduced. Next, the potential of the democratic governance concepts and the way the internet is enabling these, is outlined. The downsides of digital government developments are highlighted followed by an analysis of how digital government is impacting today's representative democracies. Second, the impact of digital government systems on administrations and their way of conducting public sector services is analyzed. The triggers and key

components of government actions using digital technologies are identified. Finally, we analyze how digitization influences public service delivery.

Chapter 3 highlights the importance of the identification of digital divides in society. Digital government can only be representative for the society as a whole, if the digital divide is minimized. Therefore, first the concept of the digital divide is introduced. We identify, why it is important to look at this phenomenon and then identify whether it might disappear by itself eventually. Next, we elaborate on whether ICT will exacerbate or ameliorate social inequalities. In order to address this, we introduce the capability approach. This approach addresses the use of ICT based on the capabilities of individuals in a society. Thereby, it outlines the potential of the use of ICT in order to enable citizens to fully lift their potential in life. It is critically discussed, whether the capability approach seems useful in overcoming the digital divide. Next, several European initiatives are outlined, which were launched in order to overcome the digital divide. The 'Digital Agenda' is one of them, using means of pan-European initiatives in order to bridge the digital divide. In the final part of the chapter we outline how the digital divide is influencing the nature of public service delivery. We conclude by focusing on the influence the digital divide has on political processes.

In Chap. 4 we focus on the legal aspects of the digitization of governments. While this textbook does not make an attempt to go into depth on legal regulations, it briefly outlines the legal basis of e-government from a managerial perspective. Here, the rule of law is introduced as the fundamental concept underlying all designs of digital government service delivery. Furthermore, we introduce the concepts of authenticity, integrity, and verifiability as integral aspects of digitization of government services. Finally, we introduce the general idea of electronic signatures and their functioning as an enabling technology for digital service delivery. Another vital aspect of digital government management is the question regarding data privacy. While different global regions (e.g., United States and the European Union) have substantially different regulations on data privacy issues, this is one of the main topics of future digital governance and government regulations. The issues discussed here include aspects of how to ensure data privacy in digital government management, how to implement data privacy concepts as well as how to technically conceptualize secure data transactions. The chapter is closed with a section on the equal opportunities principle, which takes up the capabilities approach and translates them into a digital government agenda for democratic institutions.

Chapter 5 deals with the concept of online one-stop government. While many individual governmental institutions have begun to transfer their services into digital citizen-accessible services, the integration of these services into homogeneous platforms offering multiple services in one look-and-feel is lagging behind. The aim of this chapter is hence to create a vision for public service delivery. It includes a discussion on the determinants of the paradigm shift in digital era governance and takes up data privacy concepts. These are discussed using the anchor term information division of powers, which reflects the fact, that one public institution should in itself not have too much information about an individual.

These concepts are linked with the idea of using and storing data sparsely. On the basis of these considerations, the concept of one-stop government is coined in order to describe portals that offer multiple types of information based on a single sign-on solution with homogeneous data quality. We report on the difficulty that arises when trying to integrate data from different institutions which usually have their own, individually designed ICT solutions which have surfaced over many decades. In order to do so, the function orientation is loosened in favor of a process orientation which is aligned no longer with the competencies of the public sector units but with the life event situation that citizens or businesses find themselves in. We use the concept of the e-government service marketplace (eGovSM) as a prototypical example for realizing digital government one-stop services. Furthermore, we highlight how important interoperability is in order to provide seamlessly integrated e-government services. G2G data exchange is the key enabler for this, which we outline based on an interoperability framework. Finally, we investigate and depict the determinants of increasing interoperability in a landscape of heterogeneous public administration infrastructures by engineering the incentives.

Chapter 6 deals with open government. In times of social media, cloud computing and massive online data storage, it is no longer a scarcity of ICT resources that determines the amount of publicly collected information to be made available. The public sector represents one of the institutions that collect the most information of all. The majority of this information is not then made available to the public which has paid for collecting this information through taxes. Hence, many public administrations (offices of statistics, bureaus of city majors, police forces, etc.) have begun to make their data publicly available using standardized interfaces in order to enable private initiatives to make use of these data. On the one hand, this serves for higher transparency in regard to which data are collected by public institutions. On the other hand, it also enables novel business models, created for example by apps for mobile devices drawing on the massive data being made available on open data portals. We do also discuss the difficulty of making these services available and show examples where data has been provided and has not been used by the public over many years. However, using several highly successful examples, we promote open government and open data approaches and conceptualize several definitions in the realm of citizen-sourcing, wisdom of the crowd, open participation, and collaboration. We conclude by contrasting the concept of openness vs. secrecy in government and with strategic views on participation and collaboration based on open data approaches.

Chapter 7 deals with the domain of e-procurement. With a public spending quota of 35 (Romania) to 58 (Denmark) percent of BNP, how public bodies deal with procurement is a very important area of investigation. How and on what the state spends its money determines the efficiency and effectiveness of tax spending, the fairness of public procurement decisions and also largely structural regional financial politics. E-procurement bears the potential of significantly increasing the efficiency of public procurement by making procurement processes more transparent, more widely available, and more quality- and cost-oriented. However, it also bears the risk of damaging local and regional economies by creating fierce

competition with global players due to a novel dimension of market transparency. In this chapter, we first introduce the concept of e-procurement. Furthermore, we highlight why e-procurement is important and then differentiate procurement decision drivers in the public and private sector. We refer to a legal framework embedding e-procurement into international rules and outline tendering procedures. We then outline which functionalities are needed for e-procurement and introduce some common tools which are used for e-procurement in practice. Finally, we address the question whether there is a one-size fits all solution before we outline some best practices in e-procurement implementations in Europe.

In Chap. 8 we focus on the domain of e-voting. While voting is the most fundamental process of a democracy, the use of ICT has not surfaced in this domain at large. Several countries such as the United States of America look back on a long history of applying technology for voting procedures. Next to efficiency gains, this has led to partially unclear situations as the re-count of ambiguous election ballots in the 2000 US presidential election (Bush Jn. vs. Al Gore) has shown. There, 175,037 ballots cast out of approx. 6 mill. ballots in the federal state of Florida were counted as invalid by voting machines, although a number of these were in fact not. In that particular case, this led to a very difficult political situation that finally had to be decided by the Florida Supreme Court. In order to show, how digitization affects voting in democracies, we first introduce the concept and desired properties of voting systems as such. Next, we outline the idea of e-voting and elaborate on the question as to which role it can play in modernizing democracies. We then introduce the different technologies that exist including voting machines, DREs, and optical scan technology-based voting digitization. In the next part of the chapter we outline the possibilities internet-based voting is offering and discuss the concerns and merits of this novel channel. Finally, we outline best practices in e-voting and prototypical approaches as well as field experiences.

Chapter 9 deals with the concept of e-participation. Next to voting, participation is an important, and yet softer channel of citizen inclusion. We first report on the definition of e-participation and outline why participatory initiatives are both easier to implement and yet more dangerous in effect for the political agenda-setting procedures. Next, we show with some practical examples how e-participation can improve the democratic atmosphere. Therefore, we use the capabilities approach which draws upon the capabilities of the citizens. Finally, we elaborate on an 'optimal degree of democracy' stating that there must be a relation between the costs of an e-participation initiative and the effect it has on the political decision-making process. In order to do so, we introduce the e-participation balanced scorecard together with several other measurement frameworks to depict how an e-participation initiative can be judged regarding its implications even before being launched.

With this book, we make an attempt to equip the reader, be it the undergraduate or graduate student of business administration, information systems or public policy, with a fundamental understanding of what the impact of the digital era on governmental action and administrative procedures is. It may serve as a basis for teaching digital government management in theory and practice for instructors and lecturers of institutions of higher education.