Imed Boughzala · Marijn Janssen
Saïd Assar *Editors*

Case Studies in e-Government 2.0

Changing Citizen Relationships

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Foreword

Whenever decision-makers are presented with a new technology that will change society, they are typically sceptical—and rightly so. Technology evangelist, either out of sincere conviction or of industrial interests, too often promised a techno-deterministic solution to all societal problems. None more than Morozov (2013) is able to depict this approach in the title of his book: "To save everything, click here. The folly of technological solutionism."

The advent of web 2.0 was hailed by many as yet another hype. Indeed, because of its definition, experts immediately started "leapfrogging" directly to the advent of web 3.0 and 4.0. What is surprising today is how deep and long-lasting has been the impact of the "2.0" metaphor across all societal domains. Almost 10 years after the invention of the term, the implications of the change remain alive and pervasive. Almost every aspects of human life has been touched, and one can find analysis on love, religion, science, art—anything 2.0.

Government is one of the main impact area. E-government scholars know too well how slow and difficult change is in governmental culture. Yet the adoption of the 2.0 culture and technologies has been surprisingly fast, for government standards. The main driver has not been evidence though: as scholars, we've been unable to convince policy-makers about the importance of this phenomenon.

The drivers of adoption have rather been more prosaic. Firstly, the traditional institutional isomorphism: as Codagnone (2005) puts it, "each single organisation/institution tend to imitate the most legitimated and/or successful players in their population of reference (we could call them Champions), in order to become legitimised too, and to reduce uncertainty about their future". After Obama was elected (with the substantial role of social media), his first act was to sign a presidential memo on transparency that was imbued with the 2.0 culture; European government soon followed this example. Secondly, citizens pressure: the adoption rate of social media proved to be simply too staggering to be ignored. Citizens were talking (often negatively) about government on social media, and government had to join the conversation. Thirdly, civil servants themselves started using these tools (often without permission) and created the change from within.

These factors led to an organic, rather than rationally planned, adoption of government 2.0 across governments. This was probably inevitable in view of the very

nature of "2.0" technologies and should not be considered as negative in itself. However, this unstructured, bottom-up adoption led to a reality of many fragmented and improvised 2.0 initiatives. Decision-makers were put in a position where 2.0 initiative were suddenly a "must", without being equipped with the intellectual tools to design, run and evaluate them. This is probably the reason why it is fair to say that while adoption of government 2.0 is almost universal, its impact is far from being demonstrated. There were a lot of "wheels" being reinvented, and disparate projects were launched in very different fields (from service delivery to political campaigning) without integration.

Most of all, what became apparent was the lack of strategic framework guiding these initiatives. Too often openness, participation, social media presence have been considered as goals in themselves without integrating them in the correct institutional framework.

This gap in evidence-based, theoretical and strategic framework is what this book helps to address by providing an original and insightful combination of perspectives that will be useful to researchers and policy-makers alike.

Firstly, it provides a rich global coverage, bringing together concrete cases across America, Europe, Africa and Asia. This sheds light on less known excellent examples of open government (such as Greece and Brazil), and provides original lessons learnt on high-impact cases such as Pakistan and Arab countries.

Secondly, it illustrates the institutional richness of government 2.0 by presenting both local and national cases. It is particularly interesting to compare the municipal-level cases presented in different context such as US and Sweden.

Another fundamental aspect is its very complete coverage of domains previously treated separately: service delivery, policy-making and politics. It is an often ill-understood aspect of government 2.0 that these different domains call for different but deeply integrated strategic approaches.

Thirdly, while being centred on case studies, it brings together a high-profile set of theoretical models underpinning each paper that offer a very useful overview of the literature in the domain.

This continuous iteration between the richness of real-life case studies and the strive for modelling, abstraction and sound theory-building is probably the single most important contribution of the book.

Of course, the avid reader will not be completely satisfied with the answers in this book. For all the effort in building sound theoretical frameworks, this is just a first step in the right directions. Contributors point explicitly to the limitations and research challenges encountered, and it is clear that the emphasis remains still too much on the supply side and not enough on uptake and impact. Yet there is much to learn from the research presented here, both in its actual results and in the direction of the effort.

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Chapter 1
E-Government 2.0: Back to Reality, a 2.0 Application to Vet

Imed Boughzala, Marijn Janssen and Saïd Assar

Abstract E-government 2.0 refers to the inclusions of features like social web, user-generated content, the delivery and use of open data, and network effects through more user engagement. Integrating Web 2.0 technologies into e-government is expected to create opportunities to improve online public services quality, change the relationship with citizens and businesses. The integration of web 2.0 in e-government can contribute to achieve new e-government strategic objectives and policies. Yet it provides many practical and theoretical challenges as research is limited in this field. The accomplishment of the benefits and strategic contribution might be more difficult than initially anticipated.

This chapter goes back to the origins of e-government 2.0 concept and compares to initial e-government concept with regard to characteristics, related issues and research questions. Then, this chapter provides an overview of the book content—a comprehensive collection of research works concerning e-government 2.0 implementations by showing cases and business models enabled by various technologies and developed in different countries across America, Europe, Africa and Asia. E-government 2.0 is approached from the view of theory and practice interaction in this book. Contributions are based on concrete practical studies or suggested new solutions to guide e-government 2.0 initiatives grounded on the reality of the context. Many examples are available and the goal is to learn from the examples rather than on the buzz of the term and sometimes the "theoretical" speculation with plenty unproven assumptions and promises (e.g. Gartner hype curve, IT magazines, even some research papers and reports, etc). Government 2.0 is out there and much can be learned from the existing experiences. In sum, the content of the book attempts to lift the veil on challenges facing e-government 2.0 wide-spread adoption

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and to contribute to e-government literature towards a theoretical and strategic framework for guiding new 2.0 initiatives.

1.1 From E-Government to E-Government 2.0

Electronic government (e-government in short) was introduced in the mid/late 1990s. E-Government is often associated with policy choices and refers to the use of information and communication technologies (ICT) to optimize the internal and external functioning of public sector organizations. E-government implementation efforts started often with basic information provisioning and evolved towards more integrated and joined up service offerings. One of the key issues in e-government is service improvement. In many countries, the public services offered are highly bureaucratic and siloed where the citizens have no choice of service provider, whereas e-government enables the creation of integrated service delivery (Assar and Boughzala 2007; Assar et al. 2010; Weerakkody et al. 2009).

Literature related to ICT and government goes back to the 1970 (Grönlund and Horan 2005) even if the first use of ICT in the public sector goes back to the 1954 during the US presidential campaign. The origin of the term e-government is correlated with the rise of e-commerce and e-business. Indeed, the first sense of e-government covers the adoption of different e-business applications in the public services sphere—such as online transactions, CRM, electronic market places, e-auction, e-procurement and intranets/extranets (Grönlund and Horan 2005).

All around the world, significant efforts and progress are made in online public service delivery. According to the UN e-Government Survey 2012 (UN 2012), many countries are continuously putting in place e-government initiatives and ICT applications for their citizens and companies to streamline governance systems and further enhance public sector efficiencies. Indeed, citizens and businesses are benefiting from better access to information and improved interactions with governments. Furthermore, governments and public organizations have undergone considerable transformations through ICT (as a strong enabler for change) or because the rapid ICT development pressure and the context-awareness of Internet users. E-government initiatives were often accompanied by structural and process reorganizations and public agencies reform (Torres et al. 2005; Jansen and Løvdal 2009). This is often denoted as *transformational phase of e-government*. This phase involves reengineering and e-enabling back office processes and information systems to enable more joined-up and citizen-centric e-government services. This phase focuses upon cost savings and service improvement through back-office process and IS/IT change (Weerakkody and Dhillon 2008). This requires change of institution structures and various social, organizational and technological challenges at both governmental and individual citizen level (Gascó 2003). It is the transformation of government to provide efficient, convenient and transparent services to the citizens and businesses through ICT (Satyanarayana 2006). By the time, governmental organizations and decision-makers have understood that e-Government is not about (Satyanarayana 2006):

1. ‘e’ (electronic) but about government!
2. computers and websites but about citizens and businesses!
3. translating processes but about transforming processes!

In this sense, Janssen and Estevez (2013, p. 2) explain that “in the early days e-Government was primarily focused on creating citizen-centric service provisioning and on government itself, without looking beyond the boundaries of the public sector. E-Government was often discussed from the technological perspective and often with no clear connections to the public sector core values and objectives. Over the years e-Government policies and research have adopted a less techno-centric approach and the focus shifted to viewing citizens in their customer role and to creating customer-driven services.” Furthermore, slowly e-government has become more social-based and open, giving rise to the next e-government generation, called e-government 2.0, with the emergence of Web 2.0 and the rise of social networks.

This has opened up new perspectives that challenge the traditional relationship between public organizations and citizen and business. The role of citizen has been considered more central in the e-government framework. Businesses and citizens are no longer considered as an information consumer or service user but also as an information generator and service contributor. DiMaio (2009, p. 2) cites the e-government 2.0 Gartner definitions: “The use of information technology to socialize and commoditize government services, processes and data.” Business and citizens becomes actively engage and their role of service consumers and participation become integrated.

1.2 Web 2.0 as a New Opportunity for E-Government

Web 2.0 (O’Reilly 2005) is one major change that is being transforming work practices and more widely the organization at whole. Web 2.0 refers to characteristics like the delivery of software over the internet, the generation of content by users, consuming and remixing data from multiple sources and network effects gained through more participating users (O’Reilly 2007). In fact, new usages for information and knowledge sharing have emerged with the advent of Web 2.0 applications, giving rise to the Enterprise 2.0 concept (Anderson 2007). Enterprise 2.0—a new culture of technology usage—refers to “the use of Web 2.0, emergent social software platforms within companies, or between companies and their partners or customers” as defined initially by McAfee (2006). Web 2.0 is a combination of applications (Blog, Wiki, Podcast, RSS feeds, Tagging, Social networks, etc); new values related to the use of these applications (user as producer, collective intelligence, perpetual beta, extreme ease of use) and standardized technology behind these applications (Ajax, XML, Open API, Microformats, Flash/Flex) (O’Reilly 2005; Anderson 2007).

Web 2.0 applications, also called social media, are viewed as more intuitive, user-friendly, user- (social) centered, flexible and less formal than traditional information systems (Kaplan and Haenlein 2010). Kaplan and Haenlein (2010) have classified social media into six categories including:

1. collaborative projects (e.g. Wikipedia),
2. blogs and microblogs (e.g. Twitter),
3. content communities (e.g. Youtube),
4. social networking sites/systems (SNSs) (e.g. Facebook),
5. virtual game worlds (e.g. World of Warecraft) and
6. virtual social worlds (e.g. Second Life).

Used initially in the private arena, they are increasingly disseminated within professional spheres, regardless of organization type or field of activities (Boughzala 2010, 2011). They are participatory and personalized with a dynamic content, and are generated by users themselves. The generation of content attracts other users, who in turn generate content themselves. In this way the necessarily critical mass can be created to make such a social network happen, as a key condition is the creation of enough volume and transactions to create recurring users. Web 2.0 technologies are very useful for self-expression and mass participation, social networking, knowledge capitalization and co-creation, and skills and talents identification. They are a good opportunity for companies to improve best practices' sharing, and to encourage open collaboration/innovation (Chesbrough and Appleyard 2007), crowdsourcing and co-creation (Howe 2008).

Governments were not immune to these evolutions and awareness has grown among public agencies that Web 2.0 can further enhance public services and create new opportunities for change and innovation. Used the first time to name the Gov 2.0 Summit, held in Washington, DC on September 2009, the term e-government 2.0 points to the specific applications of social networks and Web 2.0 in the sphere of public services (Baumgarten and Chui 2009). The Australian Government 2.0 Taskforce (2010) defines it as the use of the new collaborative tools and approaches of Web 2.0 offers an unprecedented opportunity to achieve more open, accountable, responsive and efficient government. Many benefits were expected, such as a better match between public services and citizens' expectations, greater adoption of online services by citizens, or better control of costs and prevention of delays in the implementation of new services.

Beyond the effectiveness of information dissemination as a primary value in the first web generation, current e-government in the era of Web 2.0 could offer new opportunities for improving the involvement and participation of citizens and businesses (Nam and Sayogo 2011). This is an unprecedented opportunity for citizens to participate in discussions, develop applications and combine data from multiple sources (Osimo et al. 2009).

In addition more and more data is opened by the government to enable others to make use of it. Open data is even named the new gold (Kroes 2011; Scholl and Luna-Reyes 2011). The opening of data can crease many other advantages such as tapping into the intelligence of the crowd, improved policy making, accountability and transparency (Janssen et al. 2012). Open government data can easily be mashed up with data from other sources (companies, universities and other public bodies). In this way new innovate applications can be developed. It is also a tremendous opportunity for the government to involve the users in the development, evaluation and development of public services. There are many hackatons in which

the public developed apps based on government data. This enables new user-centric application in which information can be viewed at a glance (data visualization). A whole range of new business models are emerging adding value by making use of open data and combining these with social engagement (Janssen and Zuiderwijk forthcoming).

Indeed, several public agencies have focused on the Web 2.0 potential and the altruism of individuals to catch new opportunities of value creation (Osimo 2008). Thanks to Web 2.0, they collect ideas and opinions of a large population of citizens or businesses, sometimes even inviting them to provide services solutions (i.e. to profit from collective intelligence via Crowdsourcing platforms).

On this point, the example of the District of Columbia (Washington, USA), is quite significant in terms of e-government 2.0. Since 2009, an applications contest called *Apps For Democracy* (cited in Baumgarten and Chui 2009) makes it possible for independent developers, geeks, public and private research centers to compete in order to create innovative online services that solve practical problems expressed by citizens through a social network. The purpose may be for example to identify the different cycling routes in the district, or to check the availability of a book in a public library. Public agencies within the District of Columbia provided developers with public data in order for them to build their applications. This ability to make high-value public data available to the public encourages participation and collaboration.

1.3 E-Government 2.0 Characteristics

The move from e-government to e-government 2.0 is a phenomena clearly recognized by e-government stakeholders and the research community alike. It was announced in 2007 in the eGovRTD 2020 e-government road mapping research project (Wimmer et al. 2008). This exploratory project identified and characterized key research challenges and possible implementation models for holistic and dynamic governments in Europe in 2020 and beyond. Among the 13 interrelated research themes, the theme "E-participation, citizen engagement and democratic process" is clearly pointing to e-government 2.0 emergence. Moreover, European Community benchmark's five-stage maturity model (EUC 2009) suggests that targetization, i.e. personalized services, is the last step in e-government development and participation will be in this case the sixth next step (see Fig. 1.1).

At last, among e-government scholars, e-government 2.0 and e-participation became rapidly a subject of study such as (Chun et al. 2010; Dixon 2010; Hui and Hayllar 2010; Traunmüller et al. 2010; Nam 2011; Chun and Luna-Reyes 2012; Meijer et al. 2012; Susha and Grönlund 2012).

Main characteristics of e-government 2.0 characteristics can be summarized as follows:

- *Community-driven*: with social interactions among citizens, the government and citizens interact as equals. They are cooperating and co-creation in networks in which all parties contribute.

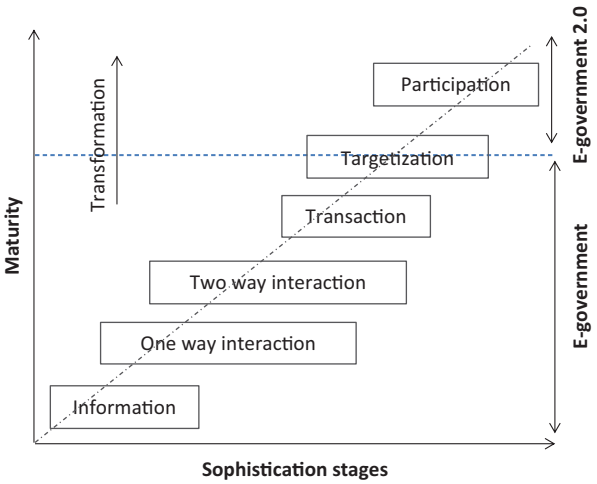

Fig. 1.1 E-government evolution framework toward e-government 2.0. (Adapted from EUC (2009))

- *User-generated content and development*. Users generate data in social networks or make use of open data by developing apps. Not the government, but business and citizens outside the government become involved in crowdsourcing, provide suggestions for improvement add ideas, develop new applications, which can ultimately result in new type of business models.
- *Openness* is a basic building block in e-government 2.0. Public sector data is opened to the public and can be used to give insight into the government operations, policy-effect, but can also used for private-sector innovation if the opening of data creates transparency, it also generates new business.
- *Collaboration*: both citizens and government generate content, interact with each other. The government becomes a platform-based. We speak about Government as a platform (GaaP) in order to enable the development of communities for sharing, collaboration, co-creation and innovation.

The following table highlights several other characteristics of e-government 2.0 compared to e-government (Table 1.1).

1.4 E-Government 2.0 Issues

If the e-government 2.0 brings a lot of opportunities for government, citizens and business, it introduces several issues and risks, mainly:

- **Security and hacking**: due to the introduction of web 2.0 technologies, the government exposes itself more to a lot of security/hacking issues such as identity theft, fraud, forgery, data leakage, insider trading, etc.
- **Labor effort**: fostering exchange and participation among and with citizens, the government may be limited by the resources to be able to respond to all requests and avoid the work overload.

Table 1.1 Dominating aspects of both of the streams. (Adapted from Janssen and Estevez (2013, p. 5))

Characteristics	E-government	E-government 2.0
Main drivers	Online public services, process digitization, transactions, citizen-centric	Online communities, social networks and citizens relationships, open data
Orientation	State, user connection, financial transactions, technology-oriented	Community of citizens, user engagement, social transactions, data valorization, collective intelligence-oriented
Values and priorities	Efficiency, Service quality, state reform and control	Service provision, openness, transparency, participation and accountability
Dominating mechanisms	ICT-driven service innovation, transformation of government structures	Changing government and citizens/business relationships, user-driven open innovation
Scope	Front-end—creating online services	Public-private networks Cross collaboration, network, managing and orchestrating the network of citizens, businesses, NGOs and government agencies
Change approach	Change within the inside government, front-end driven, online services are built based on existing processes	Outside-in driven, online services are built based on crowdsourcing processes. Opening of government
Initiatives are driven by	Bottom-up approaches which are aimed at creating ICT-based applications (champions)	Inside-out open data and outside-in innovation (ICT-based service integration (created by citizens and businesses)
Examples of services	Knowledge management, Online tax returns, applying for services and grants, e-auction, call for tenders, e-procurement, etc	Cross-agency collaboration, Open data, data visualization, public debates, citizen inquiry, participatory democracy services, tourism consultation, patents deposit and reuse, etc

- **Network operating**: Governments and citizens/business cooperate in loosely coupled networks. These networks need to be managed and orchestrated. Changes might be outside the government boundaries and need to be monitored.
- **Sustaining a community**: building and sustaining a community means that citizens/business should have an interest in participating. This needs to be reinforced.
- **Loss of control**: too much transparent may lead the government to lose control over the mastery of its information systems and legitimacy in its relationship with citizens.
- **New system and processes**: E-government 2.0 requires the development of system operating within a larger organizational network and new processes for facilitating government 2.0.
- **Institutional change**: the focus on outside the government needs likely organizational and institutional changes.

- **Intellectual rights**: collective intelligence often raises the problem of intellectual property which is difficult to prove within a mass of efforts.
- **Personal data and privacy**: Web 2.0 has always raised the lack of protection of private data. The risk with e-government 2.0 is even more since it deals with the personal identity and identification.

1.5 E-Government 2.0 Global Research Questions

E-government is a multidisciplinary field of research in which focus on practice and on practical recommendations is a prominent characteristic (Yildiz 2007; Assar et al. 2011). Efforts to theoretically found the field have opened perspectives from multiple research domains. Although theoretical ground is still under construction, it certainly qualifies as a legitimate emerging scientific discipline. As technological innovations are continuously hitting the market, the frontiers of the e-government discipline are moving and its multidisciplinary nature confirmed (Scholl 2007). The emergence of web 2.0 as an essential dimension in internet usage, e-government is shifting towards e-government 2.0. Huge opportunities are becoming available for extending e-participation, for accelerating online public service implementation, evaluation and adoption, and ultimately for introducing in the public sphere, open innovation and collaborative knowledge creation and diffusion (Baumgarten and Chui 2009).

Assar and Boughzala (2013) have carried out an exploratory field study to determine e-government evolution priorities from a Web 2.0 perspective and introduced the following e-government 2.0 challenges and research issues:

- Infrastructure and process interoperability
- End-user adoption and trust
- Anonymous access provision
- Format interoperability
- Business models
- Quality issues
- Juridical implementation issues
- Infrastructure and process interoperability
- Linking citizen identification with data authentication issues
- Organizational transformation
- Elicitation of best practices
- Citizen centered design
- Elicitation of best practices in web site design

1.6 Presentation of the Book

The material presented in this book is a collective contribution to the e-government domain. Contributors come from ten different countries and are either practitioners in e-government or researchers whom have been directly or indirectly implicated

in e-government projects. Each chapter is a specific field study in which different investigation methods have been applied and combined according to the case study methodological approach (Yin 2003). The primary audience of this book is scholars and practitioners in the area of e-government. It is also of interest to MSc level students in curriculums related to ICT in public administration, new public management, information systems and e-business, and who seek practical cases in online services design, implementation and evaluation.

Chapter 2, entitled "Social Media-based Government Explained" by G. F. Khan, presents a web survey of 200 government websites from 40 countries and 45 Web 2.0 initiatives across the globe to present and illustrate fundamental concept of the social media-based government: utilization model, implementation scenarios, and the relationships that it can hold with the citizens.

Chapter 3 on adoption and use of Web 2.0 technologies by local governments, entitled "Moving toward Web 2.0-enhanced e-government in small-town Pennsylvania" by A. Levy, E. Trauth and J. W. Bagby, investigate the nature and extent of collaborative initiatives between public and academic institutions in small college towns in support of e-government innovation. The study identified four major purposes of social media integration, including emergency notification, citizen participation, public safety, and promotion of the official municipal website.

Chapter 4, entitled "Government 2.0: A Change Towards Citizen Participation in Arab Countries" by N. Azab, E. Farzali, O. Zaher and H. Sayed, discusses the role of Web 2.0 technology in enhancing e-participation by providing a convenient communication channel between governments and citizens. In particular, they investigate e-participation of Arab countries -considered in their early path towards democracy, and whether their use of this technology would ensure a gradual transformation to democratic communities.

Chapter 5, entitled "Citizen-Driven Design: can global collaboration leverage local e-government solutions?", by A. Ekelin and S. Eriksén, presents how citizen-driven design of e-government can be promoted through trans-local cooperation. The case study consists of the Augment project which focuses on the design of a mobile service for co-creation of local accessibility, and based on the Scandinavian tradition of Participatory design in R&D cooperation with India.

Chapter 6, entitled "In the quest of opened-up governmental policies in Greece: challenges and recommendations" by E. Karamagioli and D. Gouskos, describes the key elements of the innovative effort of the Greek public administration over the last 5 years to enable the transition to a new public administration model via opened-up governmental policies, so as to improve public services provision, increase public integrity and ensure a more effective management of public resources After showcasing the most representative tools developed so far, the authors discuss their level of maturity and their potential in light of open data policy requirements.

Chapter 7, entitled "Towards the Understanding of Success in E-Participatory Budgeting Projects", by Styliani Zafeiropoulou, S. Carlsson and A. Andersson, investigates which are the success factors (SFs) for implementing e-Participatory Budgeting (e-PB) projects? And, if are they actually used in practice. e-PB includes the use of ICTs in democratic decision-making processes regarding the spending for a defined public budget where ICTs are used in order to enable more citizens

to participate? Findings show not only that the eleven SFs mentioned in previous research are met in practice in most cases, but also that additional factors arise in practice related to: size of budget, size and spectrum of target group participants, design of proposals, theme area of the budget, and civil society's involvement.

Chapter 8, entitled "Brazil Towards Government 2.0: Strategies for Adopting Open Government Data in National and Subnational Governments" by R. Matheus, M. Maia Ribeiro and J. Carlos Vaz, presents the state of art of Open Government Data (OGD) in Brazilian National, State and Municipal governments, by describing benefits that OGD have been promoted on governments and society such as transparency promotion, social control and citizen participation. In addition, strategies used by governments are outlined aimed at boosting usage and the creation of chain value of OGD usage.

Chapter 9, entitled "Twitter and 2013 Pakistan General Election: the case of David 2.0 against Goliaths" by S. Ahmed and M. Skoric, focuses on the Twitter campaigns of Pakistan's political parties with the aim to investigate how the medium was used by political parties for information dissemination, interaction, mobilization and engagement of voters. Findings identify that every party used Twitter for different purposes. Pakistan Tehreek-i-Insaf (PTI)— unexpected winner party have used Twitter in the most diverse by interacting with voters, provided real time detailed campaign updates, discussing specific social and political issues and calling for a greater mobilization of citizens to vote.

Chapter 10, entitled "The Decalogue of Policy Making 2.0: results from analysis of case studies on the impact of ICT for governance and policy modeling", by S. Koussouris, F. Lampathaki, G. Misuraca, P. Kokkinakos, D. Askounis, presents the results of the analysis of a set of promising cases researched in order to understand the possible impact of what called 'Policy Making 2.0', which refers to 'a set of methodologies and technological solutions aimed at enabling better, timely and participative policy-making'. Based on the analysis of these cases authors suggest a bouquet of (mostly ICT-related) practical and research recommendations that are relevant to researchers, practitioners and policy-makers in order to guide the introduction and implementation of policy-making 2.0 initiatives. They argue that this 'decalogue' of Policy Making 2.0 could be an operational checklist for future research and policy to further explore the potential of ICT tools for governance and policy modeling, so to make next generation policy-making more 'intelligent' and hopefully able to solve or anticipate the societal challenges we are (and will be) confronted today and in the future.

Chapter 11 is on open data strategies to increase transparency and enable re-use of their data. This chapter, entitled "A Community-Driven Open Data Lifecycle Model Based on Literature and Practice" by A.F.E. van Veenstra and T. van Den Broek, develops an open data lifecycle model based on literature and practice. Using existing open data lifecycle models this paper identifies generic phases of opening up data. Then, investigating the process of opening up data in a semi-public organization in the Netherlands, the lifecycle model was refined. While existing open data lifecycle models focus mainly on technical aspects of opening up data to ensure publication, this case study shows that involving stakeholders within the

Table 1.2 Mapping among chapter content (columns), investigation methods, and research themes (lines)

	Chapter n	02	03	04	05	06	07	08	09	10	11	12
Investigation method	*Literature review*							■				
	Quantitative (surveys)	■										
	Qualitative (interviews)		■									
	Content analysis								■			
	Action Research				■							
	Case study		■				■			■	■	
	Secondary data, Websites and/or official reports					■		■				
	Frameworks and conceptual models	■									■	■
	Social network analysis								■			
	Design science approach											■

organization as well as building an engaged community of stakeholders outside the organization—also in an early stage, is crucial to the success of open data.

Chapter 12 and last one, entitled "Social Web Ontology for Public Services", M. Krijgsman, W. Hofman and G-J. Houben, proposes an open peer-to-peer social network architecture, based on data ownership by each individual and a Social Web Ontology for interoperability between the peers. Security mechanisms are an important feature of such a network. By extending the Social Web Ontology with concepts and properties for e-Government services and applying open data principles, the architecture can also be used by authorities. The proposed architecture includes an advertising revenue model that can be offered by intermediaries storing user owned data. All will prosper by sharing as much data as they are willing, thus interoperability amongst providers is required. An architecture in which a citizen not only can own its data, maintain its social network and sells its data to advertisers, but also provides data to authorities to apply for particular government services, addresses both data privacy challenges and e-Government services. Authorities can play an important role by stimulating the implementation of a Social Web Ontology, initiate the development of data privacy monitoring modules warning users of potential privacy issues when selling data, and base public services on the Social Web Ontology. It will also allow users to present themselves differently in different context based on access control settings, e.g. private, professional, and citizen.

Table 1.2 presents a mapping between the chapters of the book and the investigation methods used.

1.7 Conclusion and Future Outlook

The chapter, as an editorial introduction to the book, describes the e-government 2.0 concept and summarizes the content of the book with a comprehensive, multi-dimensional approach to research and practice in e-government 2.0 implementation.

Contributions from an international panel of experts apply a variety of methodological approaches and illustrative case studies to present state-of-the-art analysis and perspectives.

This chapter shows that governments around the world are building frameworks and proposals for e-government 2.0. This ongoing transition towards e-Government 2.0 will not only improve participation, transparency and integration but it is also expected to speed up the space of innovation through collaboration and consultation. Ultimately, this also would result in the development of new e-government business models.

This volume addresses a gap related to the need of a theoretical and strategy framework for e-government 2.0 in the research literature, but offering timely insights on the e-government 2.0 on the ground reality. Directions for future research and policy could include many prospects such as:

- Integrating social web and semantic web to give rise to the next transformation of e-government, the e-government 3.0 and beyond.
- The assessment of transparency in practice. Transparency is more difficult that initially expected.
- The sharing of platforms. Governments should not act in isolation, but share platforms and other ICT-services. This is thanks to new opportunities related to the Cloud and Grid Computing.
- The internet of things and the huge amount of data to collect and to analysis. This will bring us to the public data governance in the stream of big data.
- Transformations necessary to profit fully from e-government 2.0. Institutional and organizational changes within the government might be necessary.

…

Finally, we hope with these contributions to show both that e-government 2.0 is a big concern, and that interaction between researchers and practitioners is fertile and needed. This is because it is true, in this field, that real problems of research are born out of real problems in the real world.

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Chapter 2
Social Media-based Government Explained: Utilization Model, Implementation Scenarios, and Relationships

Gohar Feroz Khan

Abstract Due to the lack of understanding regarding social media-based government, many practitioners around the globe (particularly those in the developing world) are reluctant or unable to develop strategies and allocate resources to social media-based government. The main purpose of the research is to address this gap in knowledge and understanding by presenting and illustrating fundamental concepts of social media-based government. A web survey of 200 government website from 40 countries and 45 Web 2.0 initiatives across the globe was used to present and illustrate fundamental concept of the social media-based government: utilization model, implementation scenarios, and the relationships it can hold with the citizens.

2.1 Introduction

Although it is believed that the social media-based government (SMBG) will finally fulfill the promise of a truly transparent government (Chun et al. 2010), many practitioners (particularly ones in the developing countries) are reluctant or unable to develop strategies and allocate resources to SMBG. As a result, governments around the world ignore or mishandle the opportunities and threats presented by the SMBG (Luna-Reyes and Chun 2012). One reason for this is that the current literature does not provide a coherent framework to explain SMBG. While models of SMBG are emerging (Linders 2012; Lee and Kwak 2012; Mergel and Bretschneider 2013), it is crucial to provide a coherent framework based multiple case studies both from developed and developing countries perspective.

To help address this gap in knowledge and understanding, this chapter provides a more holistic view of the social media-based government from the citizens' perspective taking into account several SMBG initiatives and cases. Using a web survey of 200 government websites from 40 countries (20 for each advanced and developing countries) (Chua et al. 2012) and 45 Web 2.0 initiatives from around the world,

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we suggest a three stage social media-based government (SMBG) model starting from information socialization (stage 1), and then moving on to mass collaboration (stage 2), and social transaction (stage 3). The SMBG model presented in this study is helpful in understanding social media use in public sector from the citizen's perspective. Based on the web survey, we also suggest three SMBG implementation scenarios (i.e., standalone, nested, and hybrid implementation) and the relationship that SMBG may hold with the citizens.

The rest of the chapter is organized as follows. In the next section, is an overview of the Web 1.0, Web 2.0, social media, and social network sites (SNS) (the phenomenon, technologies, and systems at the core of the ICT based governments); followed by some discussion on the e-Government and social media-based government. Next the methodology employed in this research is discussed followed by the main findings.

2.2 The Confusion: Web 1.0, Web 2.0, Social Media, and SNS

Going through the literature, there seems to be some confusion related to the Web 1.0, Web 2.0, Social Media, and SNS (Kaplan and Haenlein 2010): the platforms at the core of ICT based governments. This section will attempt to clarify this confusion.

At the core of the Internet (the global network of interconnected devices) are several technologies (hardware and software) and one such techniques is the World Wide Web (WWW) or simply the "Web" which is an arrangement of interlinked hypertext documents (i.e., websites) that can be accessed through the Internet (Berners-Lee 1993). An early version of the Web is called Web 1.0 or a "read-only web" as named by Berners-Lee; the founder of the early Web (Berners-Lee 1993). At the core of the Web 1.0 are static technologies which allow only one way information flow or communication and users could only view the content, but could not contribute contents. Thus, making websites based on Web 1.0 as presentational of contents and not generative.

The limitations of the Web 1.0 are seemed to be overcome by the Web 2.0; a term first used to describe web technologies beyond the static pages of earlier web sites (O'Reilly 2007). Unlike Web 1.0, at the core of Web 2.0 is two-way information flow and user generated contents (O'Reilly 2007; Kaplan and Haenlein 2010; Kietzmann et al. 2011). Thus, this makes the Web 2.0 as presentational as well as being a generator of user generated contents (UGC The fundamental principles of Web 2.0 are openness, participation, and sharing). In the Web 2.0, the end user is not only a user of the application/system/web, but also an active participant by using a variety of tools including, podcasting, blogging, tagging RSS-generated syndication, social bookmarking, social networking, wikis, and other collaborative tools.

When we talk about Web 2.0, social media comes into mind. Social media and Web 2.0 are often use interchangeably. However, there is a slight difference

between social media and Web 2.0 (Kaplan and Haenlein 2010). Social media is an application of the Web 2.0 concept. At the core of social media is Web 2.0 concept, in other words, social media is realized based on Web 2.0 concept. Furthermore, Web 2.0 is not a technical standard or an update to the early standard (i.e., web 1.0), but it reflects the changes in the way people use the Web. According to Kaplan and Haenlein (2010, p. 61) social media is, "a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of user-generated content." Social media consists of a variety of tools and technologies that includes collaborative projects (e.g., Wikipedia and wiki-spaces), Blogs (e.g., WordPress) and microblogs (e.g., Twitter), content communities (e.g., YouTube), social networking sites (e.g., Facebook and Cyworld), folksonomies or tagging (e.g., delicious), virtual game worlds (e.g., World of Warcraft), virtual social worlds (e.g., Second Life), and all other internet-based platforms that facilitate the creation & exchange of UGC. All these social media tools are built on Web 2.0 philosophy, but they differ according to the extent to which they focus on the relationships among social actors, users' identities, conversations among social actors, content sharing, social presence (the ability to know if other users are accessible), reputation management, and the extent to which people can form groups (Kietzmann et al. 2011)[1]. For example, a *social network site* is a type of social media that focuses mainly on social relationships among social actors and YouTube is a type of social media that mainly focus on the sharing of contents (e.g., videos).

Another two terms/concepts usually confused are social media and SNS. A social network service or site is an internet-based platform that is used to build and maintain social relations among people who share interests, activities, backgrounds, or real-life connections. Boyd and Ellison (2007, p. 1–2) defined the SNS as, "web-based services that allow individuals to (1) construct a public or semi-public profile within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system."

SNS is an example of the application of social media i.e., all SNS are social media, but not all social media are SNS. For example, Facebook is an SNS (i.e., facilitate online social networking) and is based on Web 2.0 concepts (i.e., social media & UGC), however, Wikipedia is a type of social media (focused more on online collaborative content creation), but not an SNS (i.e., does not facilitate online social networking). Similarly, all SNS are based on Web 2.0, but not all Web 2.0 are SNS and all social media are based on Web 2.0 concept.

To sum up, based on the above discussion, social media can be defined as, "an Internet based technologies/tools/concept—allows the creation and exchange of user-generated content while letting users establish (at least one of these) identity,

[1] More discussion on how social media tools differ can be found in Kietzmann et al. (2011)'s study: Kietzmann, J. H., Hermkens, K., McCarthy, I. P., Silvestre, B. S. (2011). Social media? Get serious! Understanding the functional building blocks of social media. *Business Horizons, 54*(3), 241–251, ISSN 0007-6813, 10.1016/j.bushor.2011.01.005.

conversations, connectivity (i.e., presence), relationships, reputation, groups, and share contents" (Khan 2013, p. 2).

2.3 E-Government, Government 2.0, and Open Government

At its current stage, use of technology in public sector can be conceptualized at least in three different ways: electronic government, government 2.0 (i.e., social media-based government), and open government. Electronic government or e-Government—the use of ICTs in the governance process—is one of the most widely studied mediating phenomena of the late 1900s (Jean and Juri 2000; Layne and Lee 2001; Silcock 2001; Heeks and Bailur 2007; Irani et al. 2007; Yildiz 2007; Isfandyari-Moghaddam 2011; Khan et al. 2011; Khan et al. 2012a; Zheng et al. 2012). Investment in the e-Government, also known as Government 1.0, seems to have enabled government to be more transparent, effective, and efficient, while accelerating socio-political and economic development. However, the e-Government initiative was mostly (at least at its initial stages of development) based on static ICTs and web 1.0 phenomena, thus having limited opportunities for citizens to openly interact with their governments (Pina et al. 2009; Chun et al. 2010). For example, e-Government can be instrumental in keeping citizens connected with the government, but not engaged.

For implementing a truly open, transparent, and participative government, researchers are looking for a more participative inter-mediatory technology that provides more opportunities for the citizens/business to openly interact with government. Social media seems to be one such intermediary. Social media is becoming an emerging medium for interaction between governments, government & citizens, and other governmental agencies & businesses (Sandoval-Almazan and Gil-Garcia 2012). Government that is driven by social media is called Government 2.0 (Eggers 2005), collaborative government (McGuire 2006; Chun et al. 2012), do-it-yourself government (Dunleavy and Margetts 2010), government as a platform (O'Reilly 2010), Social Government (Khan et al. 2012b), or we-Government (Linders 2012). In contrast to its predecessor (i.e., e-government or government 1.0), which focuses on the information delivery, SMBG is an idea that calls on harnessing the power of Web 2.0 concepts and social media tools/technologies to implement a true open, transparent, and participative government (Bertot et al. 2010, 2012; Luna-Reyes and Chun 2012). Khan (2014) defines SMBG as "a governance culture of transparency, openness, and collaboration facilitated by social media" (Khan 2013, p. 8). Regardless of the competing labels, the basic idea of SMBG calls on harnessing social media technologies/tool in the governing process (Dadashzadeh 2010; Mergel 2010). The Australian Government 2.0 Taskforce (2010) define SMBG or Government 2.0 as, "Government 2.0 or the use of the new collaborative tools and approaches of Web 2.0 offers an unprecedented opportunity to achieve more open, accountable, responsive and efficient government." (The definition is available

here: http://www.finance.gov.au/publications/govresponse20report/index.html.) Maio (2009, p. 2) defined it as, "the use of information technology to socialize and commoditize government services, processes and data." It is believed that social media and web 2.0 tools can good governance at various levels, including government-to-government (G2G), government-to-citizen (G2C), government-to-business (G2B), and government-to-employee (G2E) relationships (Khan et al. 2012b; Sandoval-Almazan and Gil-Garcia 2012).

A third form of government made possible by technology is Open Government (Patrice 2010). While e-government is about transforming internal process and SMBG leverage social media, open government is more about the concept of opening government data to public (employing variety of technologies). Under the umbrella of open government, governments open massive amount of data to public letting them to innovate with it. Examples of open government include President Obama's open government initiative.

2.4 E-Government vs. SMBG

E-Government and SMBG can be slightly differentiated in three ways. First, from a technological point of view, e-Government is fundamentally based on the static enterprise and domain specific technologies and Web 1.0 phenomenon, while SMBG is based on the Web 2.0 concept and driven by consumer and commoditised technologies (Maio 2009). Second, from a strategy point of view, e-Government focuses on an inside-out approach: transforming and employing internal government resources to service citizens, business, and other government agencies; while SMBG is based on an outside-in approach: harnessing external resourcing (e.g., social media collaborative technologies and crowd sourcing) to service citizens, business, and other government agencies. Third, in a SMBG settings, the end user is not merely a user of the e-Government services, but also an active participant (Linders 2012) by using a variety of Web 2.0 tools, including podcasting, blogging, tagging RSS-generated syndication, social bookmarking, social networking, wikis, and other collaborative tools (this concept is discussed later in the SMBG relationship section).

2.5 Methodology

Web Survey

A Web survey of 200 government website from 40 countries (20 each from advanced and developing countries) was used to look for the extent of Web 2.0 utilization in their governmental institutes. A total of five government agency websites for each country were analyzed. The websites were from the common government

agencies in each country i.e. education, environment, finance, health, and justice. The list was originally compiled using a comprehensive methodology by Chua et al. (2012) for their study on Web 2.0 applications in the government sector.

The 200 hundred websites were manually searched for the presence of the various Web 2.0 applications during September and October 2012. Based on the Chua et al. (2012)'s categorization, the Web 2.0 use in public sector was categorized into seven categories (social networking services (SNS) (e.g. Twitter and Facebook); multimedia sharing services (MSS) (e.g. YouTube); discussion forums (DF); blogging (B); wikis (W); rich site summery (RSS); and 7) social tagging services (STS). In order to establish the presence or absence of the Web 2.0 application in the selected websites the seven variables were coded either as "yes" or "no".

Web 2.0 Initiatives

In addition, a web survey of existing 45 innovative Web 2.0 initiatives in the public sector from around the world was used (details are omitted for the sake of length considerations; the list of Web 2.0 initiatives is available at request). The initiatives were classified into 6 domains of government activities, namely, regulation, cross-agency collaboration, knowledge management, political participation and transparency, service provision, and law enforcement (Osimo 2008). Each initiative was assessed based on a coding scheme covering four dimensions/variables: (1) citizens' engagement, (2) mass collaboration, (3) social transaction, and (4) Web 2.0 complexity. The variables reflect the previous research on the social media use in public sector that categorized social media use in public sector as informational, collaborative, and limited transactional (Brainard and McNutt 2010; Bonsón et al. 2012; Khan et al. 2012b; Sandoval-Almazan and Gil-Garcia 2012). The variables were coded as: (1) low, (2) medium, and (3) high to access the five dimensions of the Web 2.0 initiatives in public sector.

2.6 Results

Social media use in public sector can be conceptualized as shown in the Fig. 2.1. The conceptualization is achieved through an inductive approach (Thomas 2006) i.e., the processing of moving from specific observations to broader generalizations and theories. In other words, the target websites and cases were observed and evaluated as explained above; and usage patterns and regularities were detected leading to the social media conceptualization model. In the middle of the Fig. 2.1 is the social media pipe (i.e., social media tools/technologies) connecting producer and consumer or prosumers (i.e., government agencies, citizens, and businesses) where the government services are co-produced that flows in both directions making government and citizen partners in the delivery of public services (Linders 2012) (the

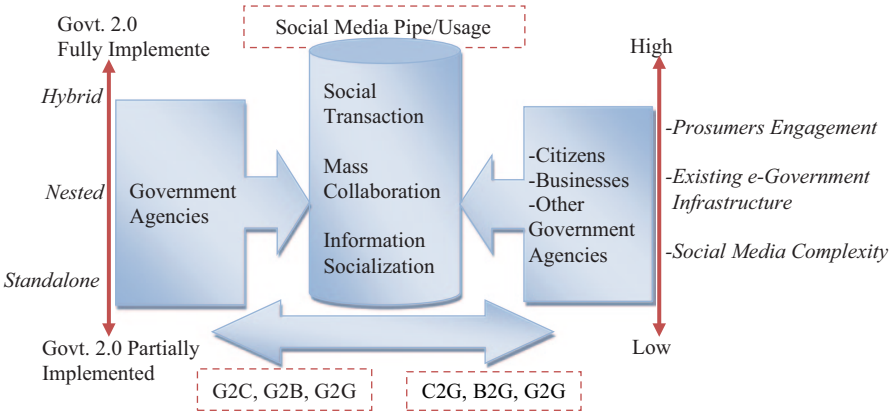

Fig. 2.1 Conceptual model of social media use in public sector. (Source: Khan 2013)

concept of the co-production is explained later in the chapter). Leveraging social media pip/tools co-production of services occurs mainly in three stages/ways (i.e., information socialization, mass collaboration, and social transaction) dependant on the existence of e-Government infrastructure, Web 2.0 complexity, and prosumers engagement (We call it SMBG model). *Information socialization stage* is instrumental in keeping citizens engaged and informed through social media channels (e.g., podcasting, blogging, tagging, RSS-generated syndication, social bookmarking, social networking, and wikis, etc.) and requires little existing e-Government infrastructure to initiate. The *mass collaboration stage* is helpful in establishing collaboration with citizens and cross-agency collaboration utilizing a variety of social media tools, while social transactions are carried out in the *social transaction stage* i.e., stage 3 and requires existing e-Government infrastructure, high level prosumers engagement, and complex Web 2.0 portals. The SMBG stages are explained (with examples) below in detail. The Fig. 2.1 also shows the SMBG is implemented scenarios: standalone, nested, and hybrid and the type of the relations it holds with the citizens. The implementation scenarios and relationships are explained later in details.

SMBG Model Stages

SMBG Stage 1: Information Socialization

At stage 1 i.e., information socialization stage, public sector employs Web 2.0 and social media tools mostly for informational and participatory purposes. Social media is used by public sector as an informational and participatory channel to increase citizen's awareness and enable them to monitor and participate in government activities (Osimo 2008). In other words, the government information is socialization (Maio 2009).

The information and participatory uses of social media were as simple as merely incorporating social media tools in the existing government website and establishing dedicated social media pages (e.g. Facebook fan page or twitter account) to delivery day-to-day information/news to the citizens. Or they were as complex as establishing advance social media based informational government portals for informational and participatory purposes (such as www.chicagocrime.org, http://openlylocal.com/, and http://www.farmsubsidy.org/).

The simple informational and participatory use of social media was prevalent in most of the countries under study and requires limited existing e-Government infrastructure and financial resources (e.g., the government only rely on existing social media technologies/tools). This brings a huge advantage to the developing or least developed countries that lack resources (e.g., financial and technical) to establish an online presence and connect to citizens using social media tools.

However, developing advance social media based informational and participatory government portals (such as http://maplight.org/ and http://www.data.gov/about) requires expertise, financial resources, and existing e-Government infrastructure (as it is only observed in advanced economies). The School Information Service (SIS) initiative by the Ministry of Education of Singapore is a good example, of the advanced social media based government portals to keep citizens informed. The SIS (http://app.sis.moe.gov.sg/schinfo/index.asp) allows parents and students to keep track of the nationwide school by getting instant access to a variety of information such as basic school information, school location, contact details, and school achievements.

SMBG Stage 2: Mass Collaboration

Stage 2 of SMBG is mostly focused on enabling mass social collaboration and crowd sourcing. At this stage, government and the citizens not only talk, but collaborate also. Social media and Web 2.0 are used to foster collaborations between the government and government & citizens and other governmental agencies & businesses at different levels. Particularly, mass social collaboration was found to be instrumental in crowd sourcing, regulation, law enforcement, and cross-agency collaborations. The mass collaboration stage goes beyond merely incorporating social media tools into government websites and requires harnessing dedicated tools, expertise, and existing e-Government infrastructure.

The collaborative use of social media was visible at different levels, such as, collaboration between government and citizens and cross agency collaboration. For example, the Peer-To-Patent (www.peertopatent.com) initiative by the Patent and Trademark Office (USPTO) of the United States is a good example of mass government and citizen social collaboration in reinforcing regulations. Similarly, Korean government agencies have developed a number of smart phone apps to foster mass collaboration between the government and citizens in the areas such as tourism (http://english.visitkorea.or.kr/enu/HD/event/enu_20120925/enu.html) and law enforcement.

SMBG Stage 3: Social Transaction

The Social transaction stage takes SMBG beyond information sharing and collaboration by enabling transaction carried out through social media channels. At this stage, using Web 2.0 platforms, government and citizens talk, collaboration, and transect. Social media is used to provide online service to the citizens. The Social transaction stage is mostly observed in advanced economies where e-Government readiness is high, such as South Korea, the Netherlands, the United Kingdom, Denmark, and the United States (UN 2012). In the real sense, a true social transaction stage has yet to be realized i.e. social media integrated public services are still limited (e.g. using Facebook to provide tangible services to citizens such as renewing drivers licence and paying partaking tickets). However, governments around the world seem to be committed in slowly harnessing social media to deliver some services. For example, the U.K. government use a Web 2.0 based website (www.gov.uk) to provide simple, one-stop access to government services online (e.g. services related to housing, tax, driving test, passport, births, deaths, marriages and care).

The Delaware state government through its "social media hub" (http://www.visitdelaware.com/socialmediahub/) provide a variety of tourism related service (e.g. hotel info, weather updates, travel guide, event calendar, maps, attractions, videos, and pictures, etc.) to citizens by integrating several Web 2.0 and social media tools, including Twitter, Facebook, YouTube, Blogs, Flicker, and Google maps into a single platform. "Fixmystreet" is yet another example of using social media for service delivery (http://www.fixmystreet.com/), where citizens use an interactive portal to report a problem related to their locality (e.g. fly tipping, broken paving slabs, or street lighting) which is then forwarded to the council to fix the problem.

SMBG Implementation Scenarios

There are several ways in which SMBG can be realized. Based on the web survey, three main ways in which SMBG is implemented were observed: Standalone SMBG, Nested SMBG, and Hybrid SMBG. Standalone SMBG is mostly observed in the developing and least developed countries where e-Government is not yet fully functional; nested government is observed in the countries having established e-Government infrastructure; and hybrid government is an advanced form of SMBG relying heavily on a variety of technologies including Web 2.0 and is mostly often observed in the advanced economies listed on top of the UN's e-Government readiness index. Below is an explanation of each of the scenarios in detail.

Scenario 1: Standalone SMBG

In the standalone implementation scenarios, informational SMBG (i.e. stage 1) can be implemented directly under traditional government settings (i.e. paper based government). This unlikely scenario reflects the countries around the world (e.g.

Zimbabwe, Rwanda, and Fiji) where e-Government is not yet fully implemented (UN 2012) and who can take full benefit of social media in establishing online presence and initiating two way communications with citizens. For example, governments with limited resources and access to the internet can use social media channels (e.g. Facebook fan pages and Tweets) to disseminate/provide/link information, news, and events to the public. Implementing a standalone SMBG may require limited resources, such as, a couple of computers with Internet access and some skilled employees to manage the social media related communication.

Scenario 2: Nested SMBG

Scenario 2 is the most likely scenario where SMBG is realized under the umbrella of e-government. This scenario was mostly observed in the developing and transitional economies (e.g. Estonia, India, Pakistan, Kazakhstan, Lithuania, Poland, South Africa, and Thailand). Under this scenario, governments funnel existing e-Government infrastructure and capabilities to leverage social media tools in the day-to-day governance. By utilizing/leveraging existing e-Government infrastructure, SMBG is implemented either partially (e.g. in the case of developing countries): implementing information socialization or mass collaboration stages, or it is implemented in full swing: implementing information socialization, mass collaboration, and transactional stages (e.g. in the case of transitional economies). SMBG is partially implemented in the developing countries by merely incorporating social media technologies (e.g. RSS feeds, discussions features) into their existing e-Government websites or by establishing visible social media presence (e.g. through using dedicated Facebook and Twitter pages/accounts).

Scenario3: Hybrid government

Hybrid government is the ideal scenario where all governments will eventually evolve to and where some have already reached. This type of government is observed in advanced economies, such as South Korea, the Netherlands, the United Kingdom, Denmark, and the United States who has already made significant achievement in the e-Government (UN 2012). Utilization of different technologies and concepts (e.g. existing e-Government technologies, Web 2.0 and mobile technologies) in the governance process leads to a hybrid form of government. The hybrid government incorporates social media technologies in the governance process by leveraging the existing e-Government infrastructure and mobile technologies.

Relationships in SMBG

Alongside G2C, G2B, and G2B relationships, SMBG also holds citizens-to-government (C2G) relationships (Linders 2012): with a different set of relationships with the citizens where the roles of government and citizens are interchangeable. Unlike

e-government, in social media based governments, citizens are becoming active service providers to government and are not merely passive receivers of government services, thus making government and citizen partners in the delivery of public services (Linders 2012). This kind of mutual production of services by governments and citizens is called citizen coproduction (Linders 2012): a coproduction of public services on an unprecedented scale. Mainly, two types of C2G relationships were observed during the web survey: informational and service relationships.

C2G informational relationship

In this relationship, citizen serves as informational source to government. For example, in the stage 1 of the SMBG, in G2C relations, governments provide informational services i.e. relaying on the social media to reach out to the citizens in the form of tweets, Facebook fan pages, wikis, and blog postings. In the mean time, C2G relationship is also active. For example, using these social channels citizens also provides informational services to the governments whenever and wherever needed (e.g. inform of feedback and expert opinion, or reporting crimes and natural disasters using Web 2.0 tools).

C2G service relationship

Due to the power of Web 2.0, citizens may take the role of service provider and the government as a receiver (Linders 2012). A classic example of the C2G relationship observed is the "MyBikeLane" initiative (http://www.mybikelane.com/)—a Web 2.0 based site launched by a New York citizen—to report illegal car parking. A similar citizen-initiated system for reporting illegal car parking in disability parking spaces is "Caughtya" (http://www.caughtya.org/).These kinds of citizen initiatives (or free services providing by citizens) helps government in law enforcement through mass collaboration. This makes citizens and government as co-producer of the public service provided through social media and gives birth to a new form of relationship i.e. C2G.

2.7 Concluding Remarks

In its current landscape, use of ICTS in public sector can be conceptualized at least in three different ways: electronic government, government 2.0 (or SMBG), and open government. This chapter attempted to foster an understanding of SMBG by presenting a SMBG model, its implementation scenarios, and the relationships SMBG holds with the citizens (i.e., C2G). We categorised social media use in the public sector into three stages: information socialization, mass collaboration, and social transaction stage (Khan 2013). We also discussed three main ways in which SMBG can be implemented: standalone government, nested government, and hybrid government.

It was observed that governments from around the world use social media tools and channels to disseminate information, foster mass collaboration, enforce laws and execute regulation. SMBG was found to be useful in increasing participation, transparency, and collaboration (Chun et al. 2010; Mergel 2010). Particularly, the developing and least developed countries can leverage social media tools by establishing online presence and initiating two way communications (stage 1) with the citizens with little or no cost. Also, the finding of the study will help foster policy makers' understanding of the SMBG phenomenon and the opportunities it holds for the public sector. For example, the SMBG model and the implementation scenarios presented in the study is an easy yet comprehensive way to understanding the social media-based governments. We also discussed the C2G relationships that citizens can hold with the SMBG. Building on this knowledge, policy makers may put together policies and procedures for using social media in the governance process in accordance to their existing capabilities and needs.

In public sector (particularly in the developing world) social media is not yet used to its true potential. As it was in the case of e-government, to promote a healthy use of social media in public sector a global agenda is needed (Khan 2013). For example, the initial use of ICTs (i.e., e-government) in public sector was pushed by the G-7 Ministerial Conference on the Information Society held in Brussels in 1995. The SMBG concepts presented in this chapter can aid such initiatives by providing an easy yet comprehensive way to conceptualize social media use in public sector.

In this study, we only focused on the use of and opportunities related to social media in the public sector, however, this does not mean that social media use in the public sector does not hold risks and challenges (Kaplan and Haenlein 2010). Risks and challenges associated with social media use in public sector should be handled carefully (Chun et al. 2010). Future empirical studies are needed to access the risk and reward of social media in public sector systematically.

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Chapter 3
Moving Toward Web 2.0-Enhanced E-Government in Small-Town Pennsylvania

Anna Levy, Eileen Trauth and John W. Bagby

Abstract This chapter on adoption and use of Web 2.0 technologies by local governments in Pennsylvania represents a part of an ongoing research project to investigate the nature and extent of collaborative initiatives between public and academic institutions in small college towns in support of e-government innovation. In this research, e-government is approached as a sociotechnical, dynamic system situated within a complex context (people, technology, and location). The case study was guided by a combination of socio-technical theory and grounded theory. A study of one municipality in Central Pennsylvania (USA) revealed the transformative potential of e-government through the adoption of Web 2.0 technologies. The municipal social media toolbox offered citizens a variety of complementary yet unique ways (e.g., Facebook and Twitter) to stay connected with their municipal government and its various departments. The study identified four major purposes of social media integration, including emergency notification, citizen participation, public safety, and promotion of the official municipal website. This case represents a continuum of e-government adoption and municipal transformation from addressing problems and challenges along the way to finding successful solutions.

3.1 Background

Since the early 1990s, researchers have viewed e-government initiatives as an innovation mechanism aimed at reaching greater levels of effectiveness and interoperability in the public sector (Ho 2002; Reddick and Aikins 2012). As e-government evolves, it brings about the new environment of e-governance to municipal governments and helps stimulate the atmosphere of growing citizen engagement and democratic participation. In fact, Web 2.0 is often called a transformative technology

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since it is slowly changing the way city halls across America begin to interact with their various constituencies (Eggers 2005; Mergel et al. 2009). Moreover, social media play a role in creating a more transparent, participatory and collaborative government.

While use of municipal websites for citizen participation is less common than electronic dissemination of government information and e-services delivery, there are examples at the local level of online town meetings and deliberative polling of panels of citizens. These emerging vehicles for two-way communication between officials and citizens enhance and complement a more traditional email interaction. E-government is being pushed beyond static government websites, because the new sociotechnological environment of Web 2.0 enables users of information to play a more active role and willingly engage in adding and sharing information and knowledge. A number of studies (Bertot et al. 2012; Eggers 2005; Freeman and Loo 2009; Joseph 2012; Kuzma 2010; Peedu and Lamas 2011; Petrik 2010) report that, in recent years, governments started to experience pressure to lay the foundation for utilizing such modern Web 2.0 tools as Facebook and Twitter. Some authors suggest that this emerging trend, in part stimulated by the exponential growth of Web 2.0 subscribers[1], allows governments to tap into "the wisdom of crowds in the public service and governance processes, which are expected to increase the responsiveness of public organizations" (Anttiroiko 2010, p. 19). Revitalizing citizens' satisfaction with e-services without compromising the quality of service delivery may potentially become a side effect of using Web 2.0 to increase government responsiveness.

In the United States, President's Obama's Open Government initiative of 2009 (Obama 2009) called for establishing a system of transparency, public participation and collaboration in government through the use of new technologies. President Obama's memorandum marked the beginning of the so-called "Government 2.0 movement." Partly in response to this initiative, the use of Web 2.0 technologies in the U.S. has become a growing topic of interest for researchers and practitioners in the public sector. However, implementation of Facebook pages, Twitter accounts, and YouTube channels remains more prevalent among the federal agencies than among local government organizations. As Mergel (2010) noted in her article in *PA Times*, a majority of federal agencies and departments established at least one Facebook organizational page and at least one official Twitter account in addition to blogs, Facebook fan pages and YouTube channels in the time that passed since issuing the Open Government initiative of 2009. In contrast, a surge toward social media integration into their web presence is yet to fully reach municipal governments. On the positive note, municipal governments in the United States and United Kingdom have already started to experiment with social media applications in such key operational areas as public safety, emergency management, and citizen engagement. In 2012, a few examples of successful use of social media by municipal governments in the U.S. (including Evanston, IL; Fort Bend TX; Philadelphia, PA; Alexandria,

[1] According to World Internet Stats (http://www.internetworldstats.com/america.htm#us), on 30 September 2012, there were 166,029,240 Facebook subscribers, with penetration rate of 52.9%.

VA; Arlington, VA among others) were reported in the literature (Kavanaugh et al. 2012; Perlman 2012). Outside the U.S., there was a study done in 2011 about the Minu Viljandi (Estonia) municipal Web 2.0 e-service, which was aimed at providing citizens with the "opportunity to start a dialogue with the city government in public space issues and to participate in decision making" (Peedu and Lamas 2011). Minu Viljandi e-service also included such Web 2.0 design elements as geo-tags for improving location-based communication, comments, Facebook share/like, and rating of local initiatives (agree, disagree, neutral).

As a matter of fact, researchers have already started the discussion of a variety of ways in which local government could utilize Web 2.0 in e-government, including e-discussion forums and various other municipal practices (Petrik 2010). Many of these practices are aimed at engaging citizens and encouraging them to start a dialogue with a municipal government and contribute to the process of decision-making at the local level. A variety of Web 2.0 design elements such as geo-tags for improving location-based communication, Facebook share/like, rating of local initiatives (agree, disagree, neutral) may soon become municipal government reality.

Some scholars interested in technological innovativeness of local governments have observed that municipalities have widely embraced the Internet as a tool to communicate and disseminate information to citizens in a manner that is most useful to them and facilitate users' involvement in local public issues. The Web 2.0 technologies seem capable of providing needed access to increasingly more politically engaged citizens and support the growing ability of people to participate effectively in local community affairs.

Case studies in municipal e-government are rare and often tend to cover only certain practical issues in public policy and administration. Such practical matters could address a range of issues: from dealing with problems associated with reforming and restructuring information management in a local government setting, discussion of the project management complexities of developing an application that require interdepartmental coordination of efforts to overcoming challenges of revamping a municipal IT department. This chapter expands that research by exploring the ways in which new collaborative technologies known as "Web 2.0" affect e-government development in small-town Pennsylvania.

3.2 The Case Study Objectives

Discovery and exploration of potentially successful attempts at integration of Web 2.0 interactive tools into the practice of municipal governments may lead to more effective ways of service delivery for local communities, and may encourage greater civic participation and increase citizen trust in government. Web 2.0 collaborative tools such as Facebook, YouTube, and Twitter represent the cutting edge of IT innovation in public administration at the local level, especially at the time of increasingly influential and interwoven societal and technological innovations. Society is, arguably, at the next iteration in the evolution of e-government.

The primary objectives of this research are: (1) to investigate the potential for small municipal governments of Web 2.0 adoption, and (2) to identify factors that could help these governments take a transformative step toward encouraging greater e-participation and promoting e-democracy. The rationale for this research is to expand our current understanding of adoption and implementation of Web 2.0 technologies in small municipalities. To meet these objectives, this chapter investigates how one small municipality, the Borough of State College in Central Pennsylvania, uses social media tools in an attempt to enhance and promote its official web portal, and to encourage greater public participation in local community affairs.

3.3 Research Design

The case presented here is part of a larger study of the advancement of e-government in small-town Pennsylvania. This chapter focuses on government usage of social media in one municipality in the Commonwealth of Pennsylvania (PA), its struggles in finding successful implementation strategies and challenges that are still waiting to be overcome. The official government website of the Borough of State College (http://www.statecollegepa.us/), a college town[2] in Central PA, is the basis for this case study.

The combination of sociotechnical theory (STT) and grounded theory (GT) established the conceptual foundation for this research. The purpose of grounded theory was to fill in the contextual details within the most fundamental STT constructs such as technology, organization and society. In traditional information systems (IS) literature, a sociotechnical system represents an organization that needs to utilize new technologies to gain or sustain a competitive advantage (Trist 1981). Sociotechnical principles and approaches make successful organizational change with respect to technology possible. In later years, several scholars successfully used sociotechnical principles as grounding for making e-government a highly functional sociotechnical system (Damodaran et al. 2005). As Damodaran and her co-authors (2005) point out, e-government, just like any other successful sociotechnical system requires simultaneous configuration of all aspects of the system: technical, organizational and social (p. 7).

In this chapter, local e-government is viewed as a sociotechnical, dynamic system situated within a complex context, which includes people, technology, location, etc. While STT provided a high-level conceptual framework for gathering qualitative data about e-government in college towns in one state, the authors used grounded theory as an analytical methodological tool. Using the grounded theory approach enabled authors to examine key factors that may affect functionalities of local e-government systems and analyze the ways in which small municipality can use social media. Consistent with the current literature on Web 2.0 applications in the public sector, the authors' interpretation of social media includes online

[2] Based on modified Gumprecht's (2008) classification of American college towns.

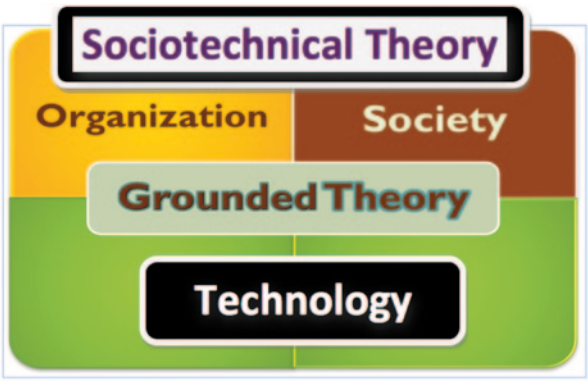

Fig. 3.1 Building blocks of GT within e-Government STS

communication communities (Twitter), social and special interest networks (Facebook, LinkedIn), user-generated content sharing services (YouTube) that emphasizes collaborative nature and social dimension of these technologies, which could be of potential value for all public institutions.

The authors approached the synthesis of grounded theory and sociotechnical theory as complementary, and such combination of GT and STT is illustrated below. Figure 3.1 shows how grounded theory approach is intended to fill in the contextual details of the foundational constructs of STT (organization, society and technology).

3.4 Methods

The case chosen for this study represents one of the common types of Pennsylvania small municipalities—a borough (with population under 45,000 residents). Since this selected site houses a public university, it can also be classified as a "college town". The governing body of the borough in Pennsylvania is an elected council, which appoints a manager, or the chief administrative officer. At the time of the study, the selected research site had a college-educated manager.

A total of five semi-structured individual interviews were held with the elected and appointed officers of the municipality over a four-month period (January–April) in 2013. The data collection for this case study included face-to-face interviews with the organization's leadership and municipal staff responsible for planning and community engagement, IT project management, communications and social media. Interviews were used as primary data collection instrument. Participants were identified using a combination of selective, snowball and theoretical sampling techniques.

For the purpose of methodological triangulation, the authors examined the official web portal of the municipality for the presence of icons for any of social media tools such as Facebook, Twitter, LinkedIn, and YouTube and analyzed the content

of organizational Facebook and Twitter pages based on publicly available data. The case examined below describes the experiences and achievements of State College in Central Pennsylvania. At the time of the study, it was the only small municipality in the state that had adopted Web 2.0 technologies.

3.5 Case Description

Introducing the Borough of State College

The Borough of State College[3] is located in Central Pennsylvania, and, as per U.S. Census 2010, the Borough population was 42,034. That fact makes State College the most densely populated borough in the Commonwealth (9500 per square mile), while it has a land area of only 5 square miles. The municipality[4] was first incorporated in 1896. State College has a council-manager form of government, where the Mayor and the Council of seven members are elected officers of the municipality, and the professional manager is appointed by Council for an indefinite term to serve as the Chief Executive and Administrative Officer. As mentioned on the website, professionally managed communities are consistently ranked among America's best places to live.[5] Administrative staff includes the Communications and Special Projects Coordinator, who is also responsible for managing social media components of e-government in the municipality. There are nine municipal departments that operate under the supervision of the Manager including the Department of Information Technology. All together, the Borough employed 175 employees at the time of the study.

The Borough is home to the Pennsylvania State University, the land-grant institution founded in 1855.At present, the Pennsylvania State University's ranking in the 2014 edition of the Best Colleges is 37 among National Universities in the United States.[6]

The Goals of the State College Borough Portal Redesign

The municipal portal redesign project was initiated in 2011. At that time, the Borough administration was concerned about the old website shortcomings, especially those related to failed community engagement online initiatives (Levy 2011). In

[3] Codes of Ordinances of the Borough of State College, https://pastatecollege2.civicplus.com/index.aspx?NID=1276.

[4] The municipality operates under the terms and provisions of the Home Rule Charter since 1976.

[5] https://pa-statecollege2.civicplus.com/index.aspx?nid=2050.

[6] Pennsylvania State University—University Park, http://colleges.usnews.rankingsandreviews.com/best-colleges/pennsylvania-state-university-university-park-6965.

2010, the Borough participated in a pilot project with several other communities such as Decatur (GA) and Palo Alto (CA), all members of the Alliance for Innovation.[7] The project was called *Open City Hall*, an online public comment platform monitored by Peak Democracy (http://www.peakdemocracy.com). That initiative was intended to stimulate civic engagement in the community. Open City Hall has been linked to Facebook and Twitter, in addition to several local media outlets that agreed to put a button on their web pages. At that time, the Facebook site has already been developed but was inactive because the borough needed a staff to monitor and moderate it.

The pilot project engendered little citizen engagement. Consequently, the Borough Council discontinued the project after the trial. Besides the fact that Open City Hall did not generate sufficient engagement level among State College residents, there were other challenges related to staff shortage, financial and content management concerns. State College was the only community that did not allow anonymous postings. However, the Borough Manager was determined to support the underlying goals of the pilot project:

> My opinion and my recommendation as a manager was that it provided a relatively inexpensive method for people to participate in government. And even if they were from Timbaktu … if they had something worthwhile to say, it was worth hearing. We should have the means and the ability to manage that. I felt that it was an important tool to allow civic engagement for people that otherwise couldn't find a way to get out to a meeting at 7 o'clock at night and participate

The need to maintain the spirit of managerial innovativeness was a valuable lesson to learn from this abbreviated pilot project, along with the call for the overhaul of the old municipal website. The Borough's IT department worked on the website makeover project in partnership with a private company called CivicPlus[8], well known for its innovative *Government Content Management System* (GCMS). The municipal IT staff sought input from both internal and external sources about the anticipated "look and feel" of the new municipal portal in addition to other desirable characteristics and functionalities. The IT department organized a special committee comprised of municipal employees from each department within the Borough who were most knowledgeable about the inner workings of their respective departments, the goals they were trying to accomplish, and the innovative ways their department wanted to communicate with citizens. All redesign-related decisions were made based on the general consensus of the entire committee. The redesign team understood the importance of seeking input from citizens, businesses and community organizations that could potentially use the website in the future. The project management team conducted a website survey at the beginning of the redesign process, which enabled the municipality to gain more accurate and deeper

[7] *Alliance for Innovation* (http://transformgov.org/en/home is an international network of progressive governments and partners committed to transforming local government by accelerating the development and dissemination of innovations).

[8] Civic Plus (http://www.civicplus.com), the leading developer of government websites and online community engagement systems.

understanding of people's likes or dislikes in regards to the old website and utilize a number of creative ideas for its improvement. To entice the general public to respond to the survey, the administration made a decision to give away an iPad. According to some study participants, the response rate was very good. The analysis of survey data supplied a number of valuable insights that contributed to the successful completion of the project.

The newly redesigned portal was implemented in summer of 2012. The main objective of that redesign was to move the municipality into the Web 2.0 environment, especially because it could offer a better chance to engage the State College community electronically in a mutually beneficial conversation about issues of importance. At the same time, the new website has become better equipped to keep the community well informed. Interviewed municipal officials summarized their intent behind the portal redesign endeavor: "We wanted to move into Web 2.0 and have a better use of community engagement features within the Internet than we had with the old website." As a result, a variety of Web 2.0 tools including Facebook, Twitter, YouTube, and LinkedIn work together to help achieve the stated objectives for a new municipal portal. In time, Web 2.0-enhanced government portals in a small community could signify a new phase in advancing municipal e-government because of social media potential to foment greater citizen e-participation.

Usage of Social Media in State College

Over a year ago, the State College Borough adopted a bundle of social media tools including Twitter and Facebook, and integrated them into its official website. This fact makes this municipality unique among other small college towns in Pennsylvania investigated within the boundaries of a larger study (Bloomsburg, Edinboro, Kutztown, Lewisburg, and Shippensburg). At the time of the study, integrated Facebook and Twitter municipal accounts were primarily used for the following four major purposes:

1. Emergency notification
2. Citizen participation
3. Public safety
4. Promotion of the official municipal website.

As confirmed by data analysis, social media tools, primarily Facebook and Twitter, were very effective as an emergency notification device. Both Facebook and Twitter played a big role in the newly redesigned portal especially in the situations when local residents should have been swiftly notified of impending emergencies like water breaks, or potentially dangerous weather conditions. During Hurricane Sandy of the 2012 Atlantic hurricane season, the Borough, in addition to the Centre Region Emergency Management Agency, had an extensive notification system occurring through Facebook and Twitter, and those messages were delivered to people's computers, cell phones, and tablets.

In May 2010, before the Borough of State College has actually joined the ranks of so-called "Government 2.0 movement", the municipal administration voiced its intention to "open up government to encourage citizen participation" in one of the early drafts of the municipal *Web 2.0*/*Social Media Policy*. At the time of the study, the Borough leadership firmly supported social media as alternative tools that should be used to encourage greater participation among citizens who may be "not comfortable with coming to a public meeting and speaking in front of an elected body or writing to a council member." During an interview session in March 2013, one of the study participants expressed a widely held view among the Borough staff that social media "are alternative ways of giving a wide sector of population an opportunity to participate." The Borough has recently established an Office of Community Engagement, and the newly redesigned official website with embedded Web 2.0 applications is viewed as "an extension of the community engagement initiative."

Using social media for the purpose of public safety underscores two important factors: immediacy and crowdsourcing. From the public safety perspective, the immediacy factor is critical in the emergency situations (e.g., power blackouts, natural disasters) when time is of the essence and people are entitled to receive up-to-date information at any given moment. Using social media for solving crimes brings forward a potentially significant crowdsourcing factor. People express serious interest in police blotter. One of the study informants made an observation that "more people were signed on to our [State College] Police Department social media page before there was even a post. There are 1400 followers to State College PD when it never posted anything." In comparison, there were 248 likes on the State College Facebook page in the few months of 2013. At the same time, a more traditional yet more time- and resource-consuming way of reaching out to people through an electronic newsletter yields less than impressive results. One of the participants recalled that there were 125 subscribers to the municipal e-newsletter in 2012. Therefore, the outreach potential of social media clearly exceeds the capabilities of more traditional ways of e-government communication techniques.

Promotion of the official municipal website also plays a big role in justifying the need for social media integration and its overall usefulness. As one study participant pointed out: "If we can catch just one new person through our Facebook page vs. our website and draw them back to our website—that's the need."

Figure 3.2 shows the special relationship that exist between various social media tools (Twitter, Facebook and YouTube) and clearly demonstrates how the Borough's Facebook and Twitter pages become interconnected, yet they are both linked to the official municipal website.

Social Media Challenges

Analysis of interview transcripts highlighted some challenges that the State College Borough administrative and IT teams faced in the process of integration of

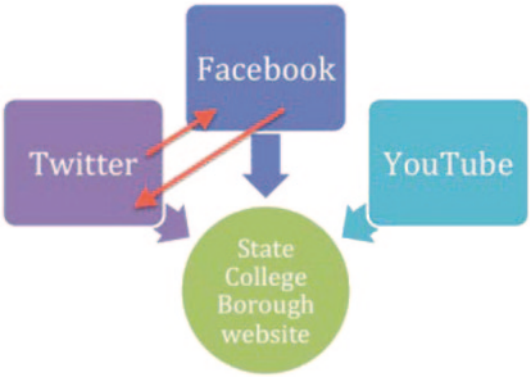

Fig. 3.2 Social media pages connections with the main organizational website

Facebook and Twitter pages into the existing municipal website. The Borough staff identified the following challenging issues set against successful integration of social media into a public organization's website: *time-sensitive content monitoring* and *content management* (inappropriate content, anonymity concerns).

An issue of time-sensitive content monitoring presented a challenge that needed to be addressed before a Facebook page or a Twitter account could become accessible to the general public. Time-sensitive monitoring refers to a municipal policy related to dealing with time sensitive posts on Facebook, which could potentially require an immediate response from the Borough employees. It was challenging because the Facebook page was not monitored 24/7.

Content management has also proven to be a serious challenge. To begin with, there was a need to decide how to deal with anonymous posts submitted electronically. In the context of e-government, anonymity concerns are still open for debate. On one hand, it is common to expect individual accountability and openness when expressing opinions in the public settings. On the other hand, all opinions could be potentially valuable, regardless whether they were expressed anonymously or not. As stipulated by one of the interviewees, a valid opinion posted anonymously is important on the merits of its content not because of the person who offered that opinion.

The problem of finding the right balance in addressing inappropriate language posted on Facebook or Twitter pages integrated into a public website has been identified as another content management challenge. A policy decision aimed at the comments laced with profanity, obscene or vulgar content should have been supportive of the individual constitutional rights yet not offensive to other people. As it turned out, that has not been a big issue because not a single post was removed due to violation of a municipal social media policy. At the end, the Borough administration succeeded in finding acceptable ways to overcome these challenges without limiting citizens' rights to freedom of expression and civic participation. As one of the study participants summarized the policy decision: "We are not trying to control or limit dialog, we want to encourage that dialog even if it's critical of something that we are doing."

Fig. 3.3 The Borough of state college Twitter site in October 2013

Usage of social media in municipal e-government is slowly gaining momentum in small-town Pennsylvania even though State College is the only one in this leading position and has actually adopted this technology shortly before the time of the study. It is important that municipal managers are considering advantages and disadvantages of using social media in the context of e-government.

Social Media Toolbox: Twitter, Facebook, YouTube, and LinkedIn

The State College social media toolbox offers citizens a variety of complementary yet unique ways to stay connected with their municipal government and its various departments. Twitter is one of the social media outlets that are rapidly gaining popularity among local residents (Fig. 3.3).

Following State_CollegePA (https://twitter.com/State_CollegePA) on Twitter provides local residents with NewsFlash alerts about construction updates, holiday parking changes, new parking technology in the Borough, Health Alerts, information about municipal employment opportunities, as well as promotional announcements about other adopted social media tools that can be of general interest (State College Police Twitter site, videos on the YouTube channel about the things to see and do in State College). It stands for a reason that the first tweet, which was posted in March 2012, happened to be an invitation to follow the newly developed State College Police Twitter site (twitter.com/StateCollegePD). It should not come as a big surprise that the State College Police Twitter has gained more popularity with the public within the same period of time (March 2012–October 2013) that the general organizational Twitter site. By October 2013, the State College Police reached 2419 followers, while the Borough still had only 818 followers. However, the Borough

exceeds the Police Department by the number of posted tweets (1020 vs. 168). The researchers examined tweets posted in October 2013. It became evident that tweets posted during that time served a variety of objectives, from addressing current political interests at the local level (e.g., to encourage greater participation in municipal elections 2013) to promoting better governance by seeking public involvement in the organizational decision making. The Borough often purposefully retweeted posts that could have been of interest to different members of the community, and they also included tweets from various government agencies, local businesses, and the Pennsylvania State University.

According the municipal Facebook *Timeline*, State College joined Facebook on May 18, 2010. However, the site remained essentially inactive until 2012. By October 2013, the official government Facebook page had 464 "likes", 24 "talking about this", and 283 "were here." The Borough of State College Facebook page (http://www.facebook.com/BoroughofStateCollege) allows people to give feedback on important community visions, including the online civic engagement initiative called *Engage State College*. It was a Facebook post in November 2012 that announced to the world that the State College Borough, in partnership with Peak Democracy[9], has launched *Engage State College* and invited people to join their first discussion about the Downtown Master Plan that would allow municipal officials to use "wisdom of the crowds" in their decision-making processes.

The official Facebook home page (Fig. 3.4) offers a clear interpretation of the Borough's priorities in opening up new channels of two-way communication between the government and the community it serves. It is about finding the new cost-efficient ways to improve the delivery of services (*Citizen Request Tracker*) and encourage greater citizen engagement in the municipal decision making process (*Engage State College*). The Citizen Request Tracker app is a specialized Internet-based citizen request management (CRM) tool that allows municipal employees to gather plentiful information within a local community about various everyday issues and concerns (e.g., potholes, fallen trees) without creating any additional demands on their time or shrinking municipal budget. By utilizing the *Citizen Request Tracker* app on Facebook, residents of the Borough have become actively engaged in reporting and fixing problems within their own community that could have otherwise gone unnoticed for a while. These requests are routinely forwarded to the appropriate municipal department, and concerned citizens are later notified about any changes made to their requests (assigned, scheduled, or completed).

The State College YouTube channel[10] streams videos of community events and open houses, thus allowing people to become fully aware of the wide scope of various municipal problems. It also gives local population a chance to get involved, to share and embed visual information. As a bonus, this channel provides access to videos that were reported in the news and/or featured by local TV stations, FOX 8

[9] Peak Democracy (http://www.peakdemocracy.com) develops Internet software that augments and diversifies online civic engagement in ways that can increase public trust in government.

[10] State College YouTube channel, http://www.youtube.com/StateCollegeBorough.

Fig. 3.4 The Borough of State College Facebook page in October 2013

WWCP in particular. In November 2013, such featured news video[11] was about the *State College Crime Map* that enabled people to track reported crimes with a click of a mouse on the State College Police web page.[12] At the same time, the channel offered a selection of playlists of community videos about things to do, ways to get around or park in the downtown State College, in addition to places to see in the vicinity. In the few weeks after October 16, 2013, the most popular video (125,077 views) on the State College YouTube channel was about a new Zipcar car-sharing program offered by the Borough in partnership with the world's leading car sharing network. This program rendered an affordable alternative for car ownership for students over the age of 18, faculty, and members of the local community ages 21 and over.

Following the State College Borough on LinkedIn is yet another way for citizens to make connections with municipal employees (http://www.linkedin.com/company/borough-of-state-college) and learn more about an array of existing products and services.

Social Media Policy

The Borough of State College has first drafted a social media policy in May 2010 as a document for internal use only. It was a concurrent administrative decision to join Facebook that prompted drafting a policy. As stated in the document, the

[11] State College Crime Map, http://youtu.be/hEyQ9FnIylI.

[12] State College Police Crime Reports, http://www.statecollegepa.us/index.aspx?nid=27.

use of social media should have met several policy objectives: (1) two-way communication of ideas and information, (2) a chance for municipal government to "monitor and respond to hot topics and emerging issues quickly", and (3) "open up government to encourage citizen participation." The document had to serve a dual purpose of informing municipal employees and officials about their additional responsibilities in the Web 2.0 environment and setting specific guidelines for all users, including the general public. According to this draft, the Borough Manager was responsible for "arbitrating and resolving issues and problems pertaining to the Web 2.0/social media policy." It also stated that the moderator(s) selected within the organization based on their "appropriate content/technical experience" and approved by the Manager would administer all official municipal social media sites. The major requirement for any social media site established by the policy draft was to provide a link back to the Borough of State College main webpage (https://www.statecollegepa.us).

At present, the social media policy is openly available on the website (http://www.statecollegepa.us/documentcenter/view/2473) and on the Facebook page. It clearly states that all municipal government social media outlets in use (e.g., Facebook pages, Twitter feed, YouTube channel) represent a moderated online discussion, and the Borough reserves the right to remove any comment that does not comply with the posted guidelines. The following nine categories of improper content have been identified in the policy:

1. Profane language
2. Content that promotes, fosters, or perpetuates any kind of discrimination
3. Solicitations of commerce
4. Confidential information of any kind
5. Comments supporting or opposing political campaigns and/or ballot questions
6. Links to or posts containing sexual or pornographic content
7. Information that may compromise the safety and security of the public or public systems
8. Content that may lead to encouragement of illegal activity
9. Content that violates a legal ownership interest of any other party

Unlike some other municipalities in Pennsylvania (e.g., Edinboro in Erie County, Shippensburg in the Cumberland Valley) that are still favoring more traditional ways of electronic communication with their constituents such email interaction, the State College administration has chosen to adopt the emergent e-communication paradigm. State College is a college town where 75% of residents are students, and a purely functional website did not attract attention of this younger crowd. Moreover, by utilizing primarily traditional ways of communicating, the democratic procedures cannot include everyone who wants to be included. State College study participants strongly suggested that the alternative ways of communication like the ability to view council meetings online or leaving comments online give a wide sector of population an opportunity to participate.

The cornerstone of the Borough's stated approach to usage of social media in e-government is to treat each medium as an alternative not a replacement of any

standard communication tool such as email. The role of social media in e-government environment is to enhance and complement traditional ways local government communicates with its constituents.

What's Next?

At the time of the study, the Borough of State College maintained only one active Facebook site for all municipal operations. However, the Borough administration remained open to the idea of creating departmental Facebook sites, particularly for the State College Police and the Public Works Department. The purpose of such additional Facebook pages would be meeting the specific needs of these departments. Moreover, the departmental Facebook sites are intended to become efficient and time-saving tools. While the Police Department Facebook page could be used to gather useful information for solving crimes in State College, allowing local residents to report street surface potholes and other dangerous conditions on the streets of the Borough in real time may help improve performance of the Public Works Department.

3.6 Conclusion

The long-standing e-government barriers such as staff shortages, budgetary constraints and lack of advanced technical skills that were previously identified and widely discussed in the literature are still challenging enough to slow down adoption of new Web 2.0 technologies in small municipalities. However, this research grounded in empirical data demonstrates that these barriers can be compounded by some further social media adoption concerns and a mix of obstacles associated with technology implementation. Those additional difficulties arise from a number of policy considerations related to social media content management and the need to monitor and moderate the two-way communication of ideas and information.

As described earlier in this chapter, State College went through a number of conceptual and implementation challenges during the Web redesign project of 2011, which had been focused on integration of social media tools into the official municipal portal. This research indicates that the struggles and challenges that the Borough of State College experienced in 2011 might be part of a natural phase in e-government development in small municipalities. These impediments are often superficial and can be overcome in time.

In this case study, e-government is approached as a sociotechnical, dynamic system situated within a complex context (people, technology, and location). Sociotechnical theory dictates that successful implementation of a dynamic e-government system requires simultaneous configuration of all the major systemic components (technology, organization and society). For small municipalities with

limited staff who may have inadequate technological expertise and deliver public services under tight financial constraints, approaching the dilemma of moving toward Web 2.0-enhanced e-government from the sociotechnical theory perspective should be beneficial.

Current research indicates that a number of factors lead to successful implementation of Web 2.0-enhanced e-government in small municipalities:

1. Strong leadership and managerial innovativeness
2. Input from staff and end users (citizens) during the portal redesign process
3. Collaboration between different departments within the public organization
4. Citizen engagement in e-government implementation and the everyday concerns of the community

Web 2.0-enhanced e-government functionalities and the experiences described in this case study such as geo-tags for improving location-based communication between citizens and local government are indeed becoming municipal government reality. The Borough has recently offered their residents a new tool, the Citizens Request Tracker that can be used to report their concerns (e.g., potholes, missing street signs, fallen streets, graffiti) to town authorities. With geo-tagging and photo taking, this application makes it easy for people to submit work requests and for a local government to significantly improve its response time and efficiency. People can now choose to connect with the State College Borough on Facebook, and Facebook like/comment/share feature allows them to let their opinions and concerns on a variety of topics known, from public safety during snow emergencies to the Borough's parking services and a new neighborhood plan.

In the post-implementation phase, it is hardly possible to overlook an importance of developing a Web 2.0 municipal policy that will safeguard consistent and efficient use of social media tools throughout the entire organization and help it deal effectively with inevitable challenges associated with using such technology (e.g., dealing with inappropriate content). The study findings also point toward another potential success factor in utilizing social media in a municipal government setting. This factor is timely selection of a moderator within a public organization. Such moderator(s) should have an appropriate content and technical expertise and, consequently, they would be able to administer all official municipal social media sites.

At the end, if a local community does not move forward, it will surely be left behind.

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Chapter 4
Government 2.0: A Change Towards Citizen Participation in Arab Countries

Nahed Azab, Ellias Farzali, Ola Zaher and Heba Sayed

Abstract The rapid evolution of Information and Communication Technology (ICT) practices and applications have forced many governments to adopt new mechanisms to satisfy their citizens' emerging need for participation. This participation can be achieved when government develops a communication channel that enables it to listen to citizens' needs, opinions, proposals, and concerns making citizens closer to decision-makers, which contributes in creating a democratic environment. Narrowing the gap between citizens and governments would assist policy makers in overcoming some of the economic, social, and political problems. This paper discusses the role of one of the most influential ICT applications, Web 2.0 technology, in enhancing e-participation through providing a convenient communication channel between governments and citizens. In particular, it investigates e-participation of Arab countries -considered in their early path towards democracy, and whether their use of this technology would ensure a gradual transformation to democratic communities. The research starts by demonstrating Web 2.0 tools, their different stages of implementation, and their application in e-government stages. In addition, there will be an analysis as to the extent of use of Web 2.0 by Arab countries to assess their adoption of Web 2.0 for participation, better communication, and transparency with citizens. A number of issues are raised: Are Arab governments using Web 2.0 effectively? Do they recognize the value of Web 2.0 in citizens' engagement in public policy making? Are they exploiting the specific features

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of each Web 2.0 tool? Does Web 2.0 use differ among traditional Arab regimes and Arab Spring countries? Preliminary findings will be discussed leading to suggestions for further research venues.

4.1 Introduction

The world is witnessing a great evolution in ICT with a fast pace aiming to better serving mankind around the globe. Most governments worldwide took advantage of this development through Electronic Government (e-government). Governments expected that ICT could provide a communication channel that fosters their relationships with citizens (Fang 2002; Panagiotopoulos 2011). E-government has transformed from e-government 1.0—offering information and services to the citizens through a one-stop shop (Ho 2002) in a one directional non-interactive manner (Tapscott and Williams 2006)—to e-government 2.0 that facilitates citizens' participation and involvement in public policy making through utilizing Web 2.0 technology (Ferro and Molinari 2009).

During government 1.0 era, despite the availability of public services (such as e-payment, request for service, bill inquiry, etc.) that allow for a simple and convenient manner to access services, governments fail to promote their use (Veljković et al. 2012). Interacting with the government was through their portals using emails or feedback forms. Even when citizens used these tools to express their questions and petitions, lack of response from the governmental side renders these tools ineffective as a dialogue medium (Debra 2012). It appears that governments needed to provide a more interactive approach to understand citizens' needs and engage them in being a major stakeholder in the decision-making process. A study conducted by ACT Government (2010) refers to a number of advantages when engaging people in the public policy making. First, individuals and groups will convey experience and expertise, which may not be available within government institutions. Second, governments will obtain citizens' support to government projects in the implementation phase. Finally, citizens' involvement will increase awareness and knowledge of local population about the vision of the government and the development of its social leaders.

When incorporating ICT to strengthen democracy and public involvement in policymaking, Caldow (2004) states that increasing engagement and influence of citizens induces the demand for more interactive tools. Web 2.0 technologies provide collaborative and dynamic applications supporting the creation of an environment of "openness and networking" (Tapscott and Williams 2006). These applications enable citizens to express their views and ideas, and share their knowledge in different forms (text, audio, and video) through the use of social networks, blogs, etc. Since Web 2.0 tools make information more available and participation more effective, they would assist citizens in finding opportunities to participate in the decision-making process, or at least would raise the level of collective public consciousness. Such benefits would aid governments in promoting themselves as citizen-centric, transparent, inclusive, and networked (Osimo 2008).

The participation in decision-making is an important matter in democratic governments; this participation is much less practiced in developing countries, which depend on bureaucratic systems, with lack of accurate information and transparency in dealing with their citizens. Most bureaucratic systems adopt a top-down approach in shaping and implementing public policy, without any public participation, which results in people becoming more distant from government and its decisions. Web 2.0 would even contribute positively to bureaucratic systems by making their work more visible and accountable (Wood 2010), which could benefit both citizens and government for efficient social transformation (Prasopoulou 2010).

Even though the value of government 2.0 in citizens' participation is acknowledged, there is a scarcity in demonstrating its implementation (Dixon 2010). Therefore, this chapter attempts to fill a research gap and to add to the body of knowledge of the application of Web 2.0 in civic engagement by the public sector. The chapter aims also to provide an overview of Web 2.0 use to assist governments in better exploiting the features of Web 2.0 tools since most developing countries have not yet reaped sufficient benefits from this relatively emerging technology. The main purpose of the research is to investigate the extent of Web 2.0 application by Arab governments. In particular, it addresses a number of research questions:

- How Arab governments are using Web 2.0 technology?
- Are Arab governments utilizing Web 2.0 features successfully?
- Is there a difference in Web 2.0 use among countries sharing a number of common characteristics?
- Are Arab-Spring governments using Web 2.0 more efficiently than well-established Arab regimes?

Arab countries are selected to examine the variations of Web 2.0 use in nations that share several similar characteristics (language, religion, culture, close geographic locations), and follow bureaucratic regimes. Moreover, conducting such study is particularly important to note if there exists a difference in Web 2.0 use among governments of well-established regimes and governments of the Arab Spring revolutions—started in 2011, and sent optimistic signals for democratic transformation—where social networks among other Web 2.0 tools played an integral part in their success (Howard et al. 2011). To achieve the study's objective, a qualitative research was first conducted to review the literature related to Web 2.0 and its applicability in the public sector. In addition, a comparative analysis of a sample of portals representing Arab governments was carried out to evaluate the extent of Web 2.0 implementation, and its role in enhancing public participation to achieve social, economic and political transformation.

The research starts by clarifying the meaning of Web 2.0, its different stages, and its applicability on the different stages of e-government implementation. Next, it assesses the extent of use of Web 2.0 tools in Arab countries through checking the availability of different applications in several Arab e-government portals, and how they are employed. The results of the analysis will be discussed followed by conclusions and recommendations with respect to future research areas.

4.2 What is Web 2.0?

Web 2.0 is the term given to sites, services, and applications that are available with a set of properties. This term was coined in a meeting held between O'Reilly and Media Live International. During this meeting, experts from both sides tried to set a specific basis of differentiation between sites using traditional Web 1.0 and the new generation of sites with Web 2.0 (O'Reilly 2005). Experts at this meeting tried to specify concepts that distinguish Web 2.0 from Web 1.0 applications. The main rules agreed upon during the meeting were:

- *Intelligent and creative sense:* e.g., Google as a search engine uses intelligent search and has creative sense.
- *End Software Life Cycle:* maintenance and updating will be a continuous developmental process.
- *Supporting technologies:* Web 2.0 is supported by development and programming techniques such as AJAX, RSS, XML, XSLT, XHTML, and CSS.
- *Ease of use:* being user friendly, Web 2.0 tools allow the user to build the content himself or be involved in building it.
- *Services rather than software package:* the most important concept of Web 2.0 is the provision of a set of services that can be used through applications, and not a software package.
- *Participation:* users can build and participate in Web 2.0 content through posting ideas and opinions, photos, videos, etc.
- *Access from any site:* Web 2.0 technologies make possibility access to service from any site, by using techniques such as RSS, ATOM, which enable publishing content through any site.

> Thus, Web 2.0 technology is composed of a set of technologies, applications and above all values aim toward efficient interaction between people to foster new businesses, technology offerings and change in social structures. (Keitt et al. from Forrester Research 2010)

Based on the above statements, Web 2.0 can be demonstrated into three main dimensions: values, technologies, and applications (see Table 4.1).

One major advantage of Web 2.0 tools is that -by large- they are free. In addition, their ease of use without the need of downloading any software made it easy for Internet users to master many of these tools instantly.

This chapter is concerned specifically with the social perspective of Web 2.0 referred as Social Web, "in which people use Web 2.0 technologies to facilitate social activities such as information foraging, sharing and tagging, and collaboration." (Chi 2008).

4.3 Stages of Implementation: Government 2.0 vs. Government 1.0

Few studies highlighted the stages of implementing Web 2.0 in government (referred to as "government 2.0"). For example, Atari et al. (2011) from Cisco IBSG suggests that reaching government 2.0 should follow three distinct stages: (i) Collaboration

Table 4.1 Operational description of Web 2.0. (Adapted from O' Reilly 2005 and Keitt et al. 2010)

Values	User as producer, Collective intelligence, Perpetual beta, Extreme ease of use. Sharing, Communication, Transparency, Empowerment, Collaboration
Technologies	Ajax, XML, Open API, Micro-formats, Flash/Flex, etc.
Applications	Blogs, Wikis, Podcasts, RSS feeds, Tagging, Social networks, Search Engines, MMOG (Massively Multi-player OnlineGames), etc

and Governance within the Public Sector: applying Web 2.0 in internal communication within and across public organizations; (ii) Interactions between Government and the Public: facilitating communication with citizens through different Web 2.0 tools; and (iii) Platform for Social Innovation and Self help: inducing cultural change through encouraging citizens proactive-ness and self-participation in formulating changes for better quality of life (Atari et al. 2011).

Chang and Kannan (2008) present a more detailed 3-stage e-government framework that demonstrates the purpose of each stage: (i) communication; (ii) interaction; and (iii) service. The framework shows also Web 2.0 tools that could be used at each stage, and involved users starting internally among civil servants and developing externally towards covering more citizens until reaching the highest implementation stage: services (see Fig. 4.1). Chang and Kannan (2008) argue that involving government employees first would be easier and would also lead to faster positive outcome. The above studies agree that Web 2.0 implementation should start internally among governmental entities. The same view is supported by Azab et al. (2013) when investigating the use of Web 2.0 in public universities. They claim "incorporating Web 2.0 in e-government should start internally by employees to help them in achieving their tasks. This could be beneficial in two ways; first, to make employees familiar with these applications and to recognize their value, and second, to encourage open culture in government".

Since government 1.0 started several years earlier than government 2.0—late 1990s (Chan and Pan 2008)-, more studies suggested different stages of government 1.0. In general, in government 1.0 era, governments' main objective was to establish an electronic gate that provides services to citizens in diverse sectors. Table 4.2 shows some of the widely acknowledged literature in government 1.0 stages.

Although both government 1.0 and government 2.0 are to be implemented over different phases, they both take different development paths. Unlike government 2.0, research in literature suggest that government 1.0 should start externally through providing information to citizens and then progress towards covering more internal use in government (see Table 4.2).

There are several views that place where best Web 2.0 could fit within e-government different stages. In the United Nations e-government survey 2012, e-participation using Web 2.0 is seen to add value to e-government in the fourth and highest stage of its implementation: networked/connected presence (earlier stages

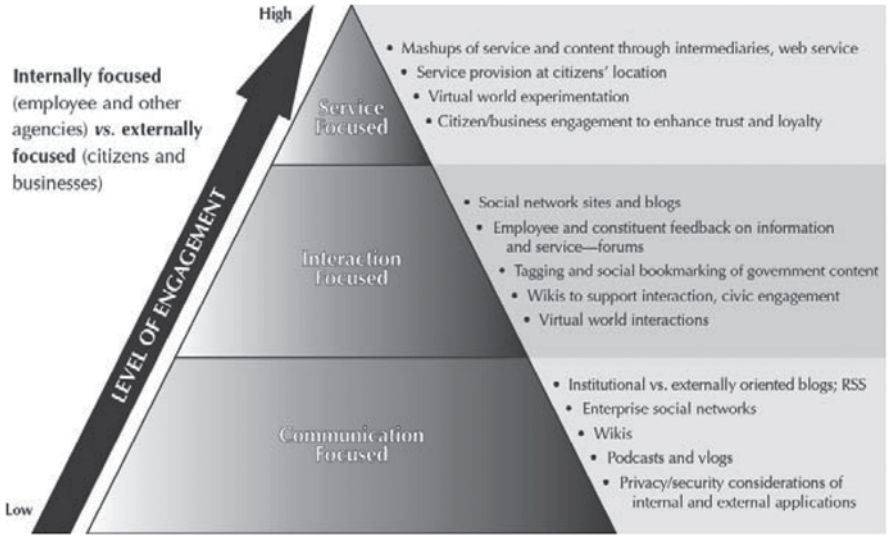

Fig. 4.1 A framework for government's use of Web 2.0. (Adopted from Chang and Kannan 2008)

are: emerging, interactive, and transactional). However, after reviewing a number of academic articles addressing the use of Web 2.0 in government, Dixon (2010) concludes that majority of the literature covers four of the five e-government stages identified by Moon (2002). The first and second stages (information dissemination and catalogue, and two-way communication) are slightly approached; whereas the third stage: service and financial transaction is not addressed. The largest research body is directed towards stages four and five: vertical and horizontal alignment, and political participation. While revisiting the literature to pinpoint real cases of Web 2.0 implementation in government, Dixon (2010) discovers that Web 2.0 applications are adopted in the first four stages, but notes a possible use of Web 2.0 in the future that support all Moon's stages.

Therefore, the authors argue that Web 2.0 tools could evidently enrich each e-government stage as follows

Stage 1: Processing Publish simple information in a more intelligent and creative sense. This could be reached through sending e-newsletters using RSS feeds to provide aggregated and updated news.

Stage 2: Interaction Deploy user-friendly interface to communicate e-services and collect feedback using social networks.

Stage 3: Transaction Offer new approaches to conduct business through creating a community around a digital market enabling government to commit transactions and/or to be an intermediary to facilitate e-commerce to the public.

Table 4.2 Understanding phases of E-government. (Adopted from Al-Hashmi and Darem 2003)

Levels	Gartner	UN/ASPA	Layne & Lee	World Bank	IBM
Access	Presence	Emerging/ Enhanced	Cataloguing	Publish	Automate/ Enhance
Interact	Interaction	Interactive		Interact	Integrate
Transaction	Transaction	Transactional	Transaction	Transact	On demand
Integration	Transformation	Seamless	Vertical integration Horizontal integration		

Stage 4: Seamless Integration Maximize use of web 2.0 tools increasing internal collaboration to dissolve barriers within (vertical integration) or between (horizontal integration) government bodies.

Stage 5: E-Participation Utilize social media to create a true timely dialogue with citizens regarding contemporary public issues. This represents the most effective use of Web 2.0 in a society.

4.4 Overview of Arab Countries

Arab countries are divided across Africa and Asia (see Fig. 4.2). In Africa, if we move from the west to the east direction, Mauritania is at the far west. Northern African countries are: Morocco, Algeria, Tunisia, Libya, Egypt and Sudan, and Eastern African ones are: Djibouti, Somalia and Comoros. Arab Countries located in Asia are: Gulf countries (United Arab Emirates (UAE), Saudi Arabia, Oman, Bahrain, Qatar, Kuwait), and the remaining nations are Iraq, Jordan, Syria, Yemen, Lebanon, and Palestine. This totals 22 Arab countries (counting North and South Sudan as one).

Social Demographics

Arab countries comprise 22 member states with cultural and ethnical diversity. As per the World Bank, Arab world total population has reached 362.5 million as of 2012 with average population growth rate of 2.3 %. The most populous member state is Egypt, with a population of 90 million people. Djibouti is the least populated with around 500,000 inhabitants. Most of the Arab states of the Gulf Area import a lot of foreign labor from less rich neighboring countries like Yemen, Egypt, Lebanon and Syria; as well as, expatriates from Asia and Africa. For example, the UAE's native inhabitants make up less than 20 % of its overall population. The Arab World religion is Islam with 90 % Muslims, followed by 6 % Christians and 4 % others.

Fig. 4.2 Arab league map. (Source: Arab League website)

Arabic is the official language of the Arab population with 72, 26 % divided over 27 dialects. Arabic is a non-native language to 20 % of the Arab League's population, with the Somali, Berber and Kurdish languages considered the most widely used after Arabic.

Table 4.3 shows that there is a growing trend in the number of Arab region population over a span of 6 years by 12 % while the GDP is growing with 87 % over the same timeframe. Meanwhile the life expectancy is demonstrating a constant number of years over the same time span.

When looking at each country (see Table 4.4), Egypt is the richest in term of population, human resources amounting to 84 million followed by Algeria amounting to 37.1 million and then Iraq with 33.4 million then Morocco with 32.6 million; however, the richest in term of GDP is Saudi Arabia with 727.3 billion USD and followed by United Arab Emirates with 358.9 billion USD. The wealthiest citizens exist in Qatar with 103,900 $ followed by UAE with 49,800 $ and Kuwait with 40,500 $ then Bahrain with GDP per capita of 29,900 $ as well as Oman with GDP 29,600 $. While the lowest GDP per capita is experienced by Somalian at 600 $ followed by Gaza people at 867 $.

Education

According to UNESCO, the average rate of adult literacy (ages 15 and older) in this region is 76.9 %. In Mauritania and Yemen, the rate is lower than the average, at barely over 50 %. On the other hand, Levant Area registers a high adult literacy

Table 4.3 Display of Arab population, GDP and Life expectancy over timespan from 2006 until 2011. (The World Bank Group 2014)

Item/Years	2006	2007	2008	2009	2010	2011
Population	317 Million	324 Million	332 Million	340 Million	347 Million	355 Million
GDP (US$)	1396 Trillion	1631 Trillion	2073 Trillion	1807 Trillion	2103 Trillion	2555 Trillion
GDP growth (annual %)	6	6	6	2	5	5
Life expectancy at birth, total (years)	69	69	69	69	70	70

Table 4.4 Displays Arab region area, population and GDP/GDP per capita of the 22 Arab countries. (Source: CIA FactBook)

#	Country	Area (Km2)	Population	GDP in $ billion	GDP per Capita in $
0.	Arab league	13.3 Million	369 Million	2,689.9	NA
1.	Algeria	2.4 Million	37.1 Million	207.8	7,600
2.	Bahrain	665	1.3 Million	27.03	29,900
3.	Comoros	2,170	767,000	.600	1,300
4.	Djibouti	23,000	923,000	1.354	2,700
5.	Egypt	1 Million	84 Million	256.7	6,700
6.	Iraq	437,072	33.4 Million	212.5	7,200
7.	Jordan	92,300	6.34 Million	31.21	6,100
8.	Kuwait	17,820	2.9 Million	173.4	40,500
9.	Lebanon	10,400	4.3 Million	41.35	16,000
10.	Libya	1.76 Million	6.5 Million	81.92	12,300
11.	Mauritania	1 Million	3.8 Million	4.199	2,200
12.	Morocco	446,550	32.6 Million	107.1	5,400
13.	Oman	212,460	2.9 Million	76.46	29,600
14.	Palestine	NA	4.5 Million	10	1,924 (West bank) 876 (Gaza)
15.	Qatar	11,437	1.9 Million	183.4	103,900
16.	Saudi Arabia	2.15 Million	28.6 Million	727.3	3,800
17.	Somalia	637,657	9.6 Million	2.372	600
18.	Sudan	1.9 Million	35 Million	59.94	2,600
19.	Syria	185,180	21.7 Million	64.7	5,100
20.	Tunisia	163,610	10.7 Million	45.61	9,900
21.	United Arab Emirates	83,600	8 Million	358.9	49,800
22.	Yemen	527,970	25,5 Million	35.64	2,300

rate of over 90%. The average rate of adult literacy shows steady improvement, and the absolute number of adult illiterates fell from 64 million to around 58 million between 1990 and 2000–2004. Overall, the gender disparity in adult literacy is high in this region, and of the illiteracy rate, women account for two-thirds, with only 69 literate women for every 100 literate men.

The Arab Thought Foundation reports that just above 8% of people in Arab countries aspire to get an education. Literacy rate is higher among the youth than adults. Youth literacy rate (ages 15–24) in the Arab region increased from 63.9 to 76.3% from 1990 to 2002. The average rate of GCC States Cooperation Council for the Arab States of the Gulf (GCC) was 94%, followed by the Maghreb at 83.2% and then the Mashriq at 73.6% (Zogby 2002).

Politics

The Third Arab Human Development Report (AMDGR) for 2010 stated that there are large economic disparities among the different regions of the Arab World (United Nations Development Programme in the Arab States 2010). The Gulf area is being the highest and most stable growing economy since it depends on oil exports to a large extent; for example, oil exports constitute 90% of export earnings in Saudi Arabia and Kuwait (The Heritage Foundation 2013). There are serious initiatives to reduce the dependence on the energy sector through spreading economic activities in other areas (The Heritage Foundation 2013).

Since the rise of the Arab Spring in Tunisia and Egypt, Gulf countries as well as other ones such as, Morocco and Jordan demonstrated economic and political reforms to respond to different protests that took place, which restored their political stability. On the other hand, Arab Spring countries (Syria, Libya, Yemen, Tunisia, and Egypt) are experiencing a political and economical unstable situation. Unemployment and inflation rates are becoming very high while their growth rates are declining. Moreover, Syria is suffering from non-human conditions due to the civil war while there are still no signs of clear resolutions. Libya—that was used to rely on oil exports—is facing political conflicts resulting in a decrease in oil exports. Even though, The Libyan government is currently planning to invest in regaining national security and undertaking a number of political and economical improvements such as, enhancing the services provided to citizens and promoting autonomy in the governme World Food nt (The World Bank 2013). Furthermore, the political environment in Yemen, Tunisia, and Egypt is very fragile (The World Bank 2013). In Yemen, the National Dialogue Conference (NDC) proceedings were delayed many times (Shakdam 2013). There is also a high insecurity atmosphere as a consequence of infighting and tribal battles and a probability of kidnaps of international groups (World Food Programme 2013). As for Tunisia, The political status became very vulnerable especially after the murder of a well-known opposition leader (The World Bank 2013). Egypt is also in a transitional phase since the regime termination of the former president who belongs to the Muslim Brotherhood group.

It is apparent that the early days of the Arab Spring have generated unrealistic expectations of rapid political transformation without a true assessment of the strong effect of a number of cultural issues, such as, the link between religion and politics, and the correct understanding of democracy (Kok 2013). Arab Spring countries are still having a long path to undergo until reaching balance, but Kok (2013) refers to the same question raised in the 1980s in Latin America: "How much poverty can a democracy withstand?" in portraying the risks in this transitional period. The threat is even crucial since the Arab Spring has raised high hopes of a promising future among educated youth struggling in looking for employment opportunities.

Technology

According to Internet World Statistics, the 22 Arab countries represent about 5.27% of Internet users' world population (Internet World Stats 2012). It is worth mentioning that the Arab region—whether in Asia or Africa—demonstrates one of the highest Internet growth rates in the world. Facebook was conscious to that fast growing market so has tailored, in March 2009, an Arabic language interface to cater for this emerging opportunity. Qatar is achieving the highest rate of Internet penetration (86%) followed by Bahrain scoring (77%) in Asia, while Morocco is having the highest ranking in Africa (51%) followed by Tunisia (39.1%). The lowest rate of Internet penetration is in Somalia (1.2%) and Maurtaina (4.5%).

After reviewing the available information related to ICT in all 22 Arab countries, it was concluded that the main challenges of Internet diffusion in Arab countries can be summarized into a number of issues: lack of independent telecommunication regulatory frameworks, state monopoly over international telecommunications and national phone networks, high cost of computers or network connectivity services (except for Gulf countries), or information technology illiteracy. Positive actions were taken to address some of these challenges: reducing the cost of technology (e.g., Oman, Comoros, Lebanon), promoting competition (e.g., Morocco, Saudi Arabia), introducing and expanding 3G Internet services (e.g., Morocco, Egypt), providing technology to schools (Algeria, Jordan), and expanding Internet connectivity across entire geographically small nations (e.g., Bahrain, Comoros).

4.5 Analysis of Using Web 2.0 Technology in Arab Countries

Methodology

Eight countries were selected as a sample of Arab countries where an examination of their use of Web 2.0 is to be carried out. The sample was chosen to represent to a great extent Arab countries since it covers diverse characteristics from different

Table 4.5 United Nations E-government survey 2012

Country	E-government development index	E-Participation	United Nations E-Government Survey 2012 world e-government ranking
United Arab Emirates	28	6	Leader in Asia
Saudi Arabia	41	9	High ranking in Asia
Tunisia	103	18	Leader in Africa
Egypt	107	7	High ranking in Africa
Sudan	165	29	Low ranking in Africa
Mauritania	181	32	Low ranking in Africa
Yemen	167	32	Lowest ranking in Asia
Somalia	190	29	Lowest ranking in Africa

perspectives such as, geographical distribution, diverse norms and cultures, monarchies and republican regimes, old and Arab Spring regimes, and highest and lowest rankings in United Nations E-Government Survey Report of 2012. The research was performed through visiting the central government portals in these eight countries. The research involves conducting a comparative analysis in terms of e-government and e-participation ranking based on the United Nations E-Government Survey Report of 2012, and noting the availability and update rate of different social media applications. In addition, a study of the content offered in each tool was conducted to provide an idea about the main topics raised at each of the sample countries.

Findings

The first four countries in Table 4.5 are the top ranked in e-government in Asia (United Arab Emirates and Saudi Arabia) and Africa (Tunisia and Egypt) in the United Nations E-Government Survey Report of 2012. The report states also that the last four countries of the sample (Sudan, Mauritania, Yemen, and Somalia) are still considered at their early stages of e-government.

E-participation index was calculated based on three main dimensions: (i) provision of information (e-information sharing); (ii) interaction with stakeholders (e-consultation); and (iii) engagement in decision processing (e-decision processing).

The detection of the availability of direct links to a number of Web 2.0 tools, Table 4.6 shows the presence or absence of Facebook, Twitter, YouTube, RSS, LinkedIn, Wikis, and Blogs.

When comparing e-participation rank with the presence of Web 2.0 tools in each country's portal, it is clear that a direct relation exists.

Findings reveal also that there is no general rule that states that high-ranked e-government countries are using Web 2.0 tools more than low ranking ones. For example, although Tunisia has a higher e-government rank than Egypt, Web 2.0 tools used by the former are less than those used by the latter are:. Tunisia utilizes

Table 4.6 Web 2.0 tools in 8 Arab countries

Country	E-Government Website	Face-book	Twitter	You-Tube	RSS	LinkedIn	WIKI	Blogs
United Arab Emirates	http://www.government.ae/	✓	✓	✓	✓	✓	–	✓
Egypt	http://www.egypt.gov.eg/	✓	✓	✓	✓	–	–	✓
Saudi Arabia	http://www.saudi.gov.sa/	✓	✓	✓	✓	–	–	–
Sudan	http://www.sudan.sd/	–	–	–	–	–	–	–
Mauritania	http://www.mauritania.mr/	–	–	–	–	–	–	–
Somalia	http://www.somaligov.net/	–	–	–	–	–	–	–
Yemen	http://www.yemen.gov.ye/	–	–	–	–	–	–	–
Tunisia	http://www.pm.gov.tn/	✓	–	–	✓	–	–	–

only 2 tools: Facebook and RSS, while Egypt uses 5: Facebook, Twitter, YouTube, RSS, and Blogs. As for low-ranked e-government countries, they still do not utilize any Web 2.0 tool.

In spite of the vast difference in e-government ranking between the highest and lowest (28 and 41 compared to 103 and 107 in Asia and Africa respectively), the difference in their Web 2.0 use is not remarkable. Reviewing the countries' portals shows also that they all contain links to Facebook and RSS. Despite the value of LinkedIn in creating a professional network around the public sector, only UAE government uses it. In addition, it seems that central governments are still not recognizing the importance of adopting Wikis as only local governments use them.

Since one of the research objectives is to assess the difference in e-participation between Arab Spring and other countries, it can be concluded that Web 2.0 adoption is not necessarily higher in Arab Spring countries. Although Tunisia is among Arab Spring countries, its e-participation rank is lower than UAE and Saudi Arabia. However, it is worth noting that different Egyptian public entities have recognized the effect of social networks after the revolution and are communicating with citizens regularly through their Facebook and Twitter accounts such as, the Military, the Cabinet, the President, opposition and other ruling party leaders.

Further, the research has included the frequency of updating the Arab countries their different social media (see Table 4.7).

While exploring the momentum of updating Web 2.0 applications in the four top ranked Arab countries in Asia and Africa, the following insights were detected:

- All four countries continuously update Facebook, Twitter, and RSS feeds.
- YouTube has not been updated for nearly 1 year in Egypt and Saudi Arabia, but is updated every 3 months in UAE.
- Egyptian Blogs have not been updated for nearly 1 year, while Blogs and LinkedIn in UAE are updated every 3 months.
- It is therefore clear that Arab governments direct more attention in the content of Facebook, Twitter, and RSS more than YouTube and Blogs.

Finally, a thorough review of the content of each Web 2.0 tool in the above four countries was undertaken. Several facts were noted:

Table 4.7 Frequency of updates of Web 2.0 tools in 8 Arab countries

Country	E-Government website	Facebook	Twitter	YouTube	RSS	LinkedIn	Blogs
United Arab Emirates	http://www.government.ae/	Up-to-date	Up-to-date	Last update: 3 mths.	Up-to-date	Last update: 3 mths.	Last update: 3 mths.
Egypt	http://www.egypt.gov.eg/	Up-to-date	Up-to-date	Last update: 1 year.			Last update: 3 mths.
Saudi Arabia	http://www.saudi.gov.sa/	Up-to-date	Up-to-date	Last update: 1 year.	Up-to-date		
Tunisia	http://www.pm.gov.tn/	Up-to-date			Up-to-date		

- The number of Facebook subscribers in Arab spring countries is much higher than the other countries (Egypt and Tunisia: 106,000 and 35,000 members respectively compared to UAE and Saudi Arabia: 3160 and 4569 members respectively). This proves that citizens in Arab Spring countries are more interested in their governments' news and in communicating with them.
- In Egypt, the government uses Facebook for political issues such as, explaining the process of political transition, clarifying some political approaches taken by the government, publishing political news ad events, etc. It was also noticed that there is high response by Facebook administrators to any citizen's inquiry. This contrasts with the other three countries where administrators' replies are very low.
- The average number of views of videos on Egyptian YouTube's government is relatively high (1729) as compared to UAE (300) and SA (166).
- In UAE and Saudi Arabia, there is a similarity in the content published in all tools. Governments in these two countries mainly use Web 2.0 to cover regular news about visits and activities of the heads of state or government senior officials. The nature of this content does not trigger any need for citizens' participation.
- Although the number of Internet users at Saudi Arabia is much higher than UAE (13 million vs. 5.9 million), unlike the similarity in Facebook subscribers in both countries, Twitter followers of UAE government are more than double those of Saudi Arabia (19,500 vs. 8146). This reflects the special interest UAE's residents in communicating with their government through Twitter.
- Despite that UAE government is the only country that uses LinkedIn, it has only 24 subscribers and very few discussions, which reflects the inattention of the government in promoting its use.
- A large part of the content in the majority of Web 2.0 pages in all countries attempts to address the international society more than local communities to convey a participatory environment to the outer world.

- Few repeated citizens participate in Web 2.0 applications of all four countries, but this could be attributed to the general evidence that no more than 30% of Web 2.0 subscribers have a real contribution (Busemann and Christoph 2009).
- There is no distinct difference in the content presented through each tool, which shows low awareness from the part of Arab governments of the special features of each Web 2.0 application.

4.6 Conclusion and Recommendations

This chapter investigated the use of Web 2.0 in government to promote public participation. An analysis was conducted on the social media applications that have links in eight governmental portals representing a sample of Arab countries. It provides an important source to practitioners and policy makers in Arab governments since it introduces the use of social media for policymaking, and the different stages of their implementation. The authors suggest that rather than basing Web 2.0 adoption of each country's e-government development stage, governments could better use social media to strengthen e-participation at any e-government implementation stage. Incorporating Web 2.0 at an early stage would disseminate the culture of participation both internally in government and externally with the society. The efficiency of Web 2.0 technology provides a valuable opportunity for increasing e-participation, especially in Arab Spring countries where Internet users are increasing at a very high rate, and citizens are highly appreciative to the value of Web 2.0. For example, Pew Research (2014) reported that 88 and 85% of Internet users in Egypt and Tunisia respectively use online social media. In particular, the number of Egyptian Internet users has increased 40% and Facebook subscribers three times since the Arab Spring (Schumpeter Columnists 2014). There is an urgent need in these countries for a continuous mutual dialogue between governments and citizens during this transitional period. The free use of these applications would also encourage their adoption since Arab Spring countries currently suffer considerable economic challenges.

The research findings reveal that Arab governments are using different Web 2.0 applications, but are not always updating all the content they provide through each tool. Moreover, the study confirms prior studies that state that Arab countries are still at an initial stage of government 2.0 (Moore 2011). Arab governments are not yet providing innovative and well-defined projects (some examples of these applications are presented in Osimo (2008), United Nations E-Government Survey (2012), Mutohar and Hughes (2013), and Chua et al. (2011)), and are favoring the launching of any Web 2.0 application rather than determining its strategic objective. This easy superficial manner of utilizing the technology will not by itself enhance citizens' participation; on the contrary, it would sometimes support autocratic regimes in strengthening their power through promoting their own governance approach, without a serious interest in encouraging citizen engagement and participa-

tion (Linde and Karisson 2013). This clarifies the high e-participation rank reflecting an e-democratic environment (Macintosh 2004) in Arab countries despite their non-democratic nature (Åström et al. 2012).

The study noted also some similarities in the content provided by governments in monarchies regimes, since it reflects mainly the activities of government or state leaders. It is also apparent that UAE citizens are interested in connecting with their government through Twitter application. This could be due to the dynamic nature of UAE government in organizing continuous events and publishing them on Twitter: the efficient tool for announcing and promoting coming events. As for Arab Spring countries, the research demonstrated a high number of Facebook subscribers in government Web 2.0 applications. Although Tunisia government uses only Facebook and RSS, Egyptian government used them in addition to YouTube—where it has a remarkable number of views-, Twitter and Blogs. It has been noted also that policy makers are keen in Egypt attach special interest in communicating and respond to their citizens' inquiries and suggestions.

Although the chapter addressed the four questions posed in this research, (How Arab governments are using Web 2.0 technology? Are Arab governments utilizing Web 2.0 features successfully? Is there a difference in Web 2.0 use among countries sharing a number of common characteristics? Are Arab-Spring governments using Web 2.0 more efficiently than well-established Arab regimes?), one can argue that it did not answer them fully. This research could therefore be considered a starting point that leads to further in-depth studies examining Government 2.0 strategies and implementations in Arab countries.

Limitations and Suggestions for Future Research

This research contributes to the knowledge area of e-government and e-participation; where there is still a shortage in investigating different research concepts related to them (Masrom et al. 2013). Even though the study has several limitations: first, it analyzed only the national government portal of each country without considering other official websites of ministries and municipalities. Second, findings represent a glimpse of the status of Web 2.0 applications of Arab Governmental main portals at a certain time, and not over a period to note any progress. These limitations could be addressed for future research. Additional research venues could be: (i) additional investigation of Web 2.0 content of Arab governments through: text mining techniques to extract patterns of similarities and differences among Arab and other developed and developing countries, and review case studies of Web 2.0 implementation in these countries; (ii) determine the opportunities and challenges of implementing Web 2.0 in Arab countries; (iii) review theories addressing the relationship between Internet and democracy; (iv) obtain citizens' feedback to Web 2.0 content provided by their government; (v) assess the effect of government 2.0 challenges on limiting the effective adoption of Web 2.0 in developing countries in general and in Arab ones in particular such as, poor infrastructure, culture,

institutional corruption, non-democratic regimes, economic problems, poor educational standards, inefficient administrative systems, political instability, etc.; or (vi) develop a framework that encompasses different dimensions of Web 2.0 application in developing countries.

Recommendations for Arab Governments

Currently, there is no single consolidated set of users' contributions of Web 2.0 (Osimo 2008), nevertheless, this section provides some guidelines that could pave the way for more concrete initiatives in capitalizing on the value Web 2.0 tools could add to Arab governments. Most importantly, there is an urgent need in these countries for a continuous mutual dialogue between governments and citizens during this transitional period. Based on the research findings, it is recommend for governments to exert more effort in customizing Web 2.0 content according to their socio-cultural context. The flexible features of Web 2.0 technology enables catering any content to local cultures to promote made-in-developing country models (Effah 2012). Hence, the content must not replicate strictly models from the developed world as best practices.

The most effective strategy to implement Web 2.0 within government systems is through its inclusion in the roadmap planning of the overall government setup from top to down reinforced by a strong political will for the developmental change in the process of work interface with public community. Hence, these tools would be regarded at the strategic level aligned with the strategic goals and objectives of Arab governments. A key approach in this direction is to understand the specific features of each Web 2.0 application as well as the demographics of the segments of the citizens using it to identify the underlying objective, strategy, and content relevant to each one. Also, implementation can be on phases with starting by knowledge-intensive domains such as patent reviews since there is a great need to leverage information and community assets in Arab governments lacking the easy access to credible information.

A third enabler is the availability of a wide range of public data for re-use in a customer friendly interactive manner, thus whenever this condition is fulfilled, consultants and concerned managers do advise policy makers to utilize Web 2.0 technology as a facilitating tool for public interaction and better output. One of the important lessons learned is the presence of a dedicated ownership for the project with a monitoring and measuring tool to assess results and take immediate corrective actions whenever required.

Further relevant governance polices must be set in place based on exiting codes. Key references could be the work carried out by the New Zealand Network of Public Sector Communicators, such as the 10 principles for public sector social media (stated in Wooden 2007), and the reflections of the BBC Web team (Loosemore 2007).

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Chapter 5
Citizen-Driven Design: Leveraging Participatory Design of E-Government 2.0 Through Local and Global Collaborations

Annelie Ekelin and Sara Eriksén

Abstract The goal of this paper is to present how citizen-driven design of e-government can be promoted through trans-local cooperation. Our case study consists of the Augment project, which focuses on the design of a mobile service for co-creation of local accessibility. Our approach is action research based in the Scandinavian tradition of Participatory design. Experiences from this project highlight issues concerning how to reconfigure the basis for design of public services. In order to cultivate spaces for citizen-driven design and local innovation, we made iterative use of global collaborations. In the initial phase, influences from R&D cooperation with India provided new spaces for participatory design practices. In the next phase, a proof-of-concept process allowed for broader local stake-holder involvement. In the third phase, the service concept was shared and expanded with partner regions in Europe through exchange of Best Practices. Currently, we are moving towards phase four, the commercialization process. Beyond the iterative design of the mobile service itself, and what trans-local collaboration contributed in this context, we also discuss reconceptualization of innovation as incremental change. We argue that transnational collaboration can be deliberately made use of for leveraging incremental change on a local level and strengthening regional innovation systems and practices.

Please note that the LNCS Editorial assumes that all authors have used the western naming convention, with given names preceding surnames. This determines the structure of the names in the running heads and the author index.

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5.1 Introduction

In this paper we present a Swedish case study of iterative citizen-driven design of a mobile service for co-creation of local accessibility—the Augment project. Methodologically, we have used an action research approach based in the Scandinavian tradition of Participatory design. The experiences from the Augment project highlight issues concerning how to reconfigure the basis for design of public services such that citizen-driven design and innovation are encouraged and supported. In order to cultivate spaces for local, incremental innovation, we made use of global research and development (R&D) collaborations we were involved in. In the initial phase of the project, the influences from on-going transnational R&D cooperation with research colleagues in India provided new spaces for participatory design practices. In the second phase of the project, the local further development of the mobile service prototype through a proof-of-concept process provided broader space for local stake-holder involvement. In the third phase of the project, the service concept was shared with partner regions in Europe through exchange of Best Practices in eGovernment and eHealth. As we now move towards phase four of the Augment project, we are bringing our experiences from the previous three phases into a commercialization process. Beyond the iterative design of the mobile service itself, and what the trans-local collaboration contributed in this context, we also discuss how innovation in e-service design can be reconceptualized based on an understanding of incremental change as central for innovation. We argue that transnational R&D collaboration can be deliberately made use of for leveraging incremental change on a local level and strengthening regional innovation systems and practices.

This paper is structured as follows; after the introduction follows background and setting, theoretical perspectives as well as methods applied. We present the four phases of citizen-driven prototyping in this case study (of which the fourth phase is yet to come). We discuss how use of trans-local prototyping can function as a method for leveraging participatory citizen-driven design of e-government.

Citizen-driven design has become increasingly important in recent development of e-government. The transition from e-government to e-government 2.0 is characterized by a shift of focus from needs gathering to needs infrastructuring (Ekelin et al. submitted for publication) with a high emphasis on citizens' agency and ability. In Sweden, the public sector has for several decades allowed for public consultation and citizen participation in pre-defined windows of time during the traditional planning processes within for instance urban planning (Wessels et al. 2012). In this project we have turned the traditional planning and design process inside out and upside down, striving for citizen-driven design which opens windows for public sector involvement.

This article discusses an approach involving citizen-driven trans-local prototyping, as a method for leveraging local innovation. The approach is based on several phases of iterative development which include multi-stakeholder development on a transnational level. The emphasis on incremental change rather than disruptive change provides a foundation for achieving sustainable innovation. This challenges traditional dichotomy of local and global as Suchman points out (Suchman 2002):

"Both locality and globalness are effects of achieved in and through the discourse and practices of ICT." Suchman (2002, p. 140). The approach includes citizen-driven initiatives as part of a continuous development life-cycle which goes beyond the limits of a set design life cycle as well as of geographical and cultural borders. In this presentation we describe four phases of local-global collaboration around participatory design of e-government. Phase 1 involves trans-local prototyping. Phase 2 involves developing a local proof-of-concept. Phase 3 involves trans-local prototyping across European regions. Phase 4—which was still on the planning stage when this article was submitted for publication—involves national prototyping aiming at commercialization and dissemination. Two important theoretical conceptual tools, which have guided the analysis, are the notions of incremental change and friction. We use them in order to describe evolution of a prototype through iterative rounds of addressing contradictions through constant renegotiation. This, we argue, is at the heart of transforming e-government to e-government 2.0.

5.2 The Background and Setting

The basic setting for creation of a cross-cultural collaborative framework on a larger and more long-term scale was established already in 2007. It started out as multi- and interdisciplinary research and development (R&D) collaboration between researchers at Blekinge Institute of Technology (BTH) in southern Sweden and the TeNet Group (The Telecommunications and Computer Networking Group) and the Rural Technology Business Incubator (RTBI) at the Indian Institute of Technology—Madras (IIT-M), Chennai, India. The theme for the cooperation was "participatory design of public e-services to support sustainable rural development"[1] and included exchange of students, researchers and business cooperation. This initial international R&D project contributed, ultimately, to the signing of a mutual cooperation agreement between the partners. Additional funding was acquired on a regional level in Blekinge.

One of the on-going research projects at BTH to which a master student from IIT-M was assigned in the autumn of 2009 was the Augment project. The Augment project rested on two fundamental principles. The first of these was the collaborative design and trans-cultural prototype development of a mobile service for accessibility. The project used a Participatory Design (PD) approach and PD methods to develop a mobile application which made it possible to upload, maintain and share location-based and experience-grounded information about accessibility issues through a map-based interface. The information was organized around the user's priority areas of interest and the project was also aiming at this stage at developing the possibility of integration with social media. This approach and the transnational

[1] The project was co-funded 2007–2009 through the Swedish Research Council and SIDA (Swedish International Development Cooperation Agency) within the framework of the *Swedish Research Links Asia* program (Swedish Research Council application number 348-2006-6728).

conditions within which the project took place opened up new possibilities, not only for technological innovation but also for development of inclusive tools for empowerment.

The aim of the Augment project was to make available map-based accessibility information in a new interactive mode, supported by social media and smart phones as a way to support co-creation of local accessibility. The Augment application was envisioned as a community-based service for sharing data, opinions, reviewing and rating of information and also exchange of personalized peer-to-peer advice concerning for instance route planning and accessibility among those who shared a concern for these types of information. The mobile application went through three rounds of local and trans-local prototyping.

The initial prototype coming out of the first phase of development of Augment was used to negotiate design space and funding for phase two, a local proof-of-concept project which involved local stakeholders such as the Regional and local handicap organizations. Phase three broadened the design by concept sharing in a European context in the form of Best Practice exchange between a numbers of different European regions. Phase four is ongoing, and the focus is still on citizen-driven design but with the aim of broader commercialization and dissemination.

5.3 Theoretical Framework which Pinpoints Incremental Innovation

Innovation is in the center of ongoing European discourse, for economic and political reasons.[2] Our understanding of innovation in design of e-government 2.0 is that it occurs in configurations of designers, developers and domain experts—including citizens' interest groups—as "*creative processes of co-development of work practices, communities, organizations and technology as 'situated innovation*'" (Dittrich et al. 2009, p. 1). The case study of the Augmentproject, presented in this chapter, shows that situated innovation also can make use of wider circles of development and thus leverage the potential of innovation and discuss what impact global collaboration possible can bring to future e-government solutions.

Localizing Innovation by Supporting Incremental Change Processes

At first we have to position what kind of innovation formula this chapter is discussing. There is an ongoing discussion whether innovation should be highlighted as

[2] See for instance The Innovation Union http://ec.europa.eu/research/innovation-union/index_en.cfm,AMPPURLEnd and the strategic program for growth within the European Union "Europe 2020", http://ec.europa.eu/research/innovation-union/index_en.cfm.

incremental change rather than disruptive and autonomous change. The latter is assumed to be accomplished solely through a successful composition of the right ingredients of advantage competitiveness and godsend inspiration coupled with a high dose of entrepreneurial skills. Another option is persistence, resilience, intuitive skills and ability to take advantage of the tensions and frictions which often occur in cross-cultural meetings whether locally, national or globally, as we discuss in this paper. Suchman and Bishop (2000) argue that innovation in practice is not a question of singular inventions or wholesale transformations; it is about artful integrations and incremental change (Suchman 1994). New things are made up of reconfigurations of familiar things, products, processes, actions. Sustainability of innovation is due to investments in supporting infrastructures. This standpoint is reinforced by the experiences presented here from the Augment project, thus illuminating the example of how alternative interpretation contributed to broadening the design space as the context is both related to small-scale settings and wider social and global relations in a global world.

Citizen-Driven Design Involves Tensions, Frictions and Flows

A second important perspective underpinning our approach, which assists in the analysis of the trans-local participatory design described in this paper, is the interplay of *tension*, *frictions* and *flows*, drawing on a notion introduced by Lowenhaupt-Tsing (2004). Tension is a natural part of multi-stakeholder cooperation. However, not all forms of tension lead to intentional and purposeful movements or changes. Friction could be seen as a metaphor for diverse and conflicting social interactions that lead to leaps and bounds of action among several stakeholders and interest groups which uphold different agendas and motives. In our interpretation, this phase of bridging unintended movement with dedicated altering could exemplify the moment where the user-involvement is presented as important and prioritized—but based on different motives and purposes, including the citizens themselves, and then acted upon. The moment when the tension between differing and counter-acting strategies and needs causes friction which ultimately leads to small changes, which in a later stage turn out to be fundamental for bringing the process further in the long run. In the Augment project, we discovered that tensions and clashes within the development project did not necessarily lead to something productive, unless such tensions were deliberately transformed into friction, which literally made change happen. (Lowenhaupt-Tsing 2004)

These two perspectives are fruitful when unfolding and re-interpreting the experiences from the Augment project. We elaborate more extensively on the described perspectives in relation to our case in the next sections which begin with a general presentation of the Augment Project. The analysis is structured as descriptions of four phases of the iterative development process.

5.4 Methodological Approach

The authors have been involved in this case study as researchers with a background in Scandinavian informatics, human work science and interaction design, conducting ethnographically inspired action research with a participatory design approach. The Scandinavian approach to systems design emphasizes a democratic base which acknowledges user expertise, mutual learning and power equality as an important foundation for technology development and use, employment of collaborative prototyping and design of software systems (Nygaard 1996; Bjerknes and Bratteteig 1995; Dittrich et al. 2002; Bratteteig 2007; Ekelin 2007a, b; Mörtberg et al. 2010; Sefyrin 2010). Participatory design allows forms of genuine participation by users, i.e. they are regarded as legitimate and acknowledged partners in a design process. This principle is possible to relate to the discussions on how to extend and evolve participation as an important part of citizen-driven e-government development lately referred to as e-government 2.0 (Assar et al. 2011). This approach also recognize that design projects is carried out as collaborative projects over vast geographical distances. The focus on design of new technologies and new domains of use have pushed participatory design to embrace redesign and reconfiguration as important part of the process (Simonsen and Robertson 2013). This underlines the fact that design is possible to complete at first in use, thus highlighting the long-term perspective of development which underpins the claims we make on embracing incremental change rather than radical modes of changes as a way to promote sustainability within design and within recent e-government development.

Multi-stakeholder Cooperation—Crossing Borders

We regard the iterations of the prototype development, which we here call Phase 1: trans-local prototyping, Phase 2: Proof-of-concept formalization, Phase 3: sharing of best practice in Europe and Phase 4: national design project in process, as part of a sustainable ecological design process. The whole process has been on-going over several years, as the project gradually evolved towards a cross-cultural project based on distributed collaboration with a focus on inclusive prototyping, putting boundary-transgressing inclusive citizen-driven design and participation in the center.

The concept of "prototype" is in our interpretation not exclusively defined as an object, an isolated artifact or a product. In the proof-of-concept development we for instance included the social relations developed and maintained during the process as well as the materials, the chosen design methods and the appropriation and adaptation of all these aspects in the co-creation of the different practices presented here, which in a formal way could be claimed as a process of innovation even if the innovation logic messages are not entirely applied. We regard this interpretation as fundamental for gaining an alternative approach towards innovation, i.e. as and motivated in Suchman (1994) and Suchman and Bishop (2000) plead for upgrading of "incremental change and artful integration". In our interpretation they argue this

from a standpoint of bringing forward respect for the organizations and individuals involved and the knowledge and skills that do not have to be overthrown by innovation but rather extracted from practice.

The research is also grounded in design ethnography, in the sense that during the life cycle of the project we are mapping out and following an ongoing process of development rather than placing the main effort on summing up, packaging and presenting the results of the development process. Participatory design in this context was about going "beyond" the established understanding of how PD is applied as well as how user-centered design takes place in practice. By involving citizens with disabilities in the design process as full members of a design assembly or a design constituency and seeing design as ongoing throughout the life cycle of a service, the ambition was to broaden the design space for Augment. (Latour 2005; Wessels et al. 2012).

5.5 Phase One: Trans-local Prototyping

The Augment project grew out of and was part of a continuous discussion in the region involving different stakeholders and interest groups, including local handicap organizations, which lasted several years and was part of an on-going dialogue between the university and the local and regional authorities. However, the first effective prototyping involved cooperation between students from India and Sweden and research exchange among Swedish and Indian scholars within the framework of the Blekinge–India cooperation.

Friction A: Establishment of a Framework of Funding and Infrastructure by Prototyping

In the autumn of 2009 an Indian master student and two Swedish students simultaneously were assigned the task of developing and presenting their prototype proposal for a mobile accessibility guide as part of the pilot study of Augment (Augment phase1). The aim was to supervise them as a group. However, there were tensions in the small group, due to differences in cultural understanding, differing commitment to the task and maybe also because of differences in knowledge and skills concerning prototyping. One of the Swedish students withdrew immediately from the project, due to personal reasons. The second Swedish student took part in a couple of meetings, he was a bit quiet during the meetings but in the end he delivered well-grounded suggestions concerning basic functionality of the imagined application, which finally were discussed further on the basis of this first, roughly sketched proposal. The master student from IIT-M, picked up the task of transforming the user demands and in three weeks developed the very first Augment prototype, which

became the basis for further development and continued citizen participation and testing in the following phases of the project development.

Friction B: How Deep Is the Participation in Trans-local Prototyping?

Another example of a friction which made the cooperation evolve in an artful way was when one of the Indian researchers raised a very important question during an international presentation of the project at a workshop at the IT University in Copenhagen, Denmark. He simply asked; how deep into the layers of the technological infrastructure does the participation go? This turned out to be a very important issue. The raised our awareness of the many layers of technology design we were working with, and thus re-occurred during discussions with the technical development team in the proof-of-concept project. It also made us reflect upon the limits of traditional user-involvement in relation to introduction of a wider community through our visions of supporting a community interest group by utilizing social media tools. It was a totally opposite approach compared to the approach of the technical group assigned for the proof-of-concept work who favored keeping technology and users apart, which became very obvious during discussions within the development cycle which we will present more in detail further on in this paper.

5.6 Phase Two—Formalising a Proof-of-Concept

In the next phase Augment became part of a formalization attempt as a proof-of-concept test in line with the innovation mainstream discourse. In parallel, the researchers also got involved in a European funded project which led on to exchange and capitalization of best-practice in e-government and e-health among European partners working together in the trans-national project. This turned out to be phase three. The Augment prototype at this stage came to function as a kind of boundary object (Bowker and Leigh Star 1999) which caused frictions in the co-operation between all the involved stakeholders, i.e. the researchers, involved citizens with disabilities, local entrepreneurs with business experience, the technical development team who were involved in the proof-of-concept work as well as the different project leaders and management. The development process was far from straightforward and neither painless, nor following a linear progression curve—as often described in the rhetoric concerning innovation endeavours.

The motives for formalizing the Augment project into a proof-of-concept could be described as an aim to gain formal acknowledgement locally for the previous work which had been put in during the first phase of prototyping. Squeezing the original Augment project into a rigged setting such as a formal proof-of-concept project could be described as a possibility to develop a local framework of technical

conditions. In this phase a technical development team was assigned to the project which meant that the researchers could concentrate upon following the project development and take a step back from trying to arrange for prototyping with the help of students. The technical development team also promised to keep an eye on the various parties' rights, the user contacts and also to take a closer look at who would possibly use the mobile service in the future who were likely to pay for it, and who would maintain the service in the future. In short, to find ways in which it could be possible to finance a more sustainable service-development process. Another aim was to investigate the commercial reasonableness of the idea, the sustainability of the business and possible support of a more dedicated business development process. The manager of the university incubator and the operational head of the technological team were supposed to offer a methodology on how to investigate the bearing capacity and were also providing interns whose job it was to take care of the formal set up of the proof-of-concept project. The researchers were supposed to follow the work, but as it turned out, this was envisioned to happen more or less from a distance.

In a discussion with the manager for the university incubator it became very obvious that they preferred a pre-defined model of innovation, they wanted to adopt another kind of model more in line with open innovation standards. A goal with this new project iteration was to find a sensible business model for this kind of service which included users as providers of information via social media but not as equal partners in a collaborative setting. The researcher's deliberate strategy was to insist on the significance of a broad citizen-driven design with user-involvement on several levels of prototyping, in line with our participatory design approach. We wanted to go beyond the level of limited user-involvement of interface design and pass the level where you can decide upon what kind of icons that will be used in the service. The aim was to affect the design of the technical infrastructure by incorporating social media tools as required by the citizens. Our strategy here was to form alliances with the involved citizen-groups and reinforce their requirements in the direct discussions and negotiations with the technical development team.

Friction C: The Painful Art of Staying Within the Form

One of the guiding questions for this analysis of the second phase of the Augment II trans-local development could be exemplified as; what is left in terms of creativity in a project where the formalisation of innovation takes over as the primary goal and overshadows the ambition to come up with new solutions which are in line with what a citizen-driven service design process aims for and expect? Several frictions were identified during this process. The formalising proof-of-concept method very quickly became a straitjacket, because it delimited the already established cooperation and the ambition to collaborate more extensively in all the stages and to support mutual learning and exchange among the involved partners in the collaboration.

From the start, there was an ambition in the technical software development team to apply the SCRUM method (Schwaber 2004) during the development process. The use of the SCRUM method in the proof-of-concept development process came up early in the negotiation process, which included stakeholders such as representatives for the researchers, people representing management and technical developers of the University Innovation Centre, a local business incubator, and a representative of the disabled persons (in this case the user representative had a double role, being also involved as a researcher in the Augment project). The official argument for applying the SCRUM method of systems development was to secure a continuous close connection to the users' needs and wishes through iterative software development in short, efficient sprints. However, it very soon became obvious that the main reason for using the SCRUM method was to keep the different parts separated and to create a free space for the technical developers in order to preserve the separation of the technology and the users.

Almost immediately, the hierarchical ordering of the project development team caused problems, mainly due to the allocation, a month after the proof-of-concept kick-off, of a new project leader who had not been involved in the process from the beginning. The ambition of keeping close and continuing contact between the technical development team and the researchers was subordinated under internal project administrative procedures and milestones almost immediately after the new project leader took over. There was also a separation and division of labor concerning the different work tasks which indicated that the work on the UI (user interface) and the main architecture of the application were neatly separated—as in most traditional software development processes. This brings us back to the question raised by the Indian colleague and researcher in the previous iteration of the Augment project, concerning what depth of user participation is allowed and supported in this kind of proof-of-concept projects in practice versus what is stated in theory, which is a specific issue of relevance for both research and practice.

Friction D: Life-Cycle Approaches Versus Development-in-a-Box

The research team has been working for a number of years with what could be defined as *incremental user involvement*, in line with the ideals of participatory design (Dittrich et al. 2002). This includes a life-cycle approach to service design and development, taking the use and the varying use situations as a starting point for planning and running the design process. The university innovation center took a different approach, emphasizing the structure and processes of a traditional systems development project, although in compressed form to fit the "sprint" metaphor of the SCRUM-method that the proof-of-concept projects aim to emulate. The researchers' aim was to support what we call situated innovation (Dittrich et al. 2009), putting emphasis on user involvement through informal contacts, making use of user-created content, focus-group discussions and design workshops and discussions arising out of the use-situations. The communication was envisioned as originating in cross-communication in various interest groups such as the local interest organi-

zations for disabled people. The strategy was to support them in building a community which could become a source for self-organization. The researchers nurtured the idealistic view that the development team then could function as "developers-on-demand" (Ekelin and Eriksén 2011).

The technical development team in turn had the opposite picture in mind; they were craving "users-on-demand" in order to fulfill their proof-of-concept assignment. Their goal was commercialization of the idea, in line with a chosen pre-defined model of innovation, rather than taking into account the life-cycle approach of incremental development of an interactive service. Their goal was clearly product oriented, and the researchers focused in their turn on the process. This contributed to the experienced problems in communication within the project, where the researchers felt they were being left out of the development process entirely, while the development team felt they were not being given access to users to the extent they had anticipated. This set off a chain of further misunderstandings and negative reactions on both sides which almost caused the project to capsize. Thus, we experienced a need for studying and articulating the tensions which rapidly escalated within the proof-of-concept project due to differing approaches to *in what way, to what extent and in what stages* the citizens (i.e. we refer here to citizens experiencing disability) should be involved in the process of testing the concept and producing a prototype which could function as a technical probe for further iterations and future refinement of the service. In the long run these tensions and clashes between differing ontologies as well as epistemologies also created the necessary friction for the project to move beyond the locked position it seemed to be stuck in.

The many changes of project management and project workers in the technical development team (change of manager in total four times over a period of one year) made it impossible to uphold a linear process and stick to the originally chosen innovation logic. At the end this iteration phase of the Augment II development was saved by a committed technical project leader who took personal pride in making the prototype work properly, rather than fulfilling the requirements of the mixed messages from the former technical project leaders and the researchers strong emphasize on the democracy grounded claim on full participation of all involved stakeholders at all stages of prototyping.

5.7 Phase Three: Proliferation of Best Practice

The next move in the incremental development cycle described in the Augment case was to make a third trans-local iteration of the project. This third round of prototype development of Augment was accomplished within the framework of a European project called "IMMODI—Implementing Mo-Di Project". This was a European project financed by the EU Program INTERREG IVC which brought together ten partners representing seven regions from seven European countries (Italy, France, Spain, Bulgaria, Germany, Finland and Sweden) where the ultimate goal of the project was transfer of experiences and best practices in e-health and e-government services in mountain and rural areas. Blekinge was classified to take part in this

project due to the rural character of and sparse archipelago in the region, which were considered to require specific attention concerning European development investments to avoid digital divide between European regions. The Augment Project was brought forward in this context and was successfully appointed Best Practice 2011 within this collaboration.

The idea with the IMMODI project was to apply an approach of "capitalization" which means that projects within the framework of IMMODI should be proliferated within the partners' regions in such a way that the activities should lead to a strategic impact on regional policies. Capitalize means to consolidate best practices by transferring them to regional programs, through the adoption of action plans for every partner region. Our approach was to emphasize the trans-local exchange, meaning that we put a strong focus on exchange of local, situated experiences of innovation practices rather than the generalized and extracted knowledge, neatly packaged in line with mainstream innovation models.

In order to achieve this, a close dialogue was considered necessary between the project partners within the project, as well as between the representatives of their managing authorities, which were organized in so called "deep delegations". For this reason, it was important to involve all relevant stakeholders responsible for regional programs, in an early stage of the project, by organizing technical and political workshops and other specific meetings. The part of defining what strategies to use in order to define how the good practices should be implemented was thus crucial to the project. The ambition was to involve relevant local authorities at an early stage, which turned out to be quite a challenge. However, this also caused local tensions and lead to the friction which pushed the IMMODI-project towards success in the end.

The IMMODI project resulted in seven action plans—one for each region—based on selected practices. The action plans were then signed by the Managing Authority of each partner region at the closing conference in Clermont-Ferrand, France in 2011. The IMMODI project was granted with a specific interest of the European Commission due to its priority theme and its relevance for the Cohesion policy and other EU policies. This interest was expressed by a "fast track" label. In this context the Augment project was presented as an example of an interesting project to bring forward as a Best practice in mobile electronic services that are becoming more and more essential for everyday life in Europe today and therefore of relevance for all the partners in the project.

Friction E: The Problem of Presenting an Unstable Best Practice

However, Augment was far from finalised at this stage, in fact we had to build the runway at the same time as we were running. In order to bring forward the idea of Augment as a Best practice, our strategy was to draw on the flexibility and work-in-progress approach of the project, i.e. drawing on the lifecycle design development as specific and unique for this project. We did not want to export a finished product

or service our aim became instead to export the methodology of iterative trans-local prototype-development as part of co-creating sustainable local practices.

The focus for the third round of prototyping then crystallized as distribution of testing of the suggested proof-of-concept-setting among the involved European partners who showed interest for implementing the coming Augment service in their local municipalities. In order to accomplish this it became necessary to set up an infrastructure for the task i.e. separate databases for storing the specific local input data and to create adjusted interfaces with pointers to the specific European sites. The Swedish technical development team was taking on part of this, but the separated timetables of the development work by the technological team and the European IMMODI-partners were not synchronised and this caused a lot of tensions which could be described as coping with the instability of the prototyping challenge and keeping the exclusiveness as Best practice within a distributed innovation process which had to be maintained throughout the whole project. Our claim then was that it is not possible to export a ready-made kit of innovation which in turn includes local socially organised networks and alliances, it is only possible to set the stage for creating new alliances which transgress the limitations set up by the generalised innovation logics which states competitiveness among peers, the idea of the "innovation divide" between urban development centres versus peripheral rural regional practices which "have to learn" from those who are socially and culturally constructed as more advanced and mature in their employment of the innovation logic messages. In this project phase the tensions mainly could be detected in conflicting commitments and funding frameworks which did not match, but it was also this which caused the frictions which made the development go further.

5.8 Phase Four and Five Coming Together—Concluding Discussion

The clashes between different ideas, visions and needs in the described transnational and trans-sectorial collaborations within the different frameworks of the case of the Augment project described in this paper resulted in many loops and re-iterations of the actual mobile application. Besides the application itself, another outcome was derived out of the fact that this project raised serious questions concerning how to combine models of open innovation and increased user-involvement with citizen-driven design with more traditional software and service development models. It also emphasized the interplay of creative thinking around the co-construction and constant reconfiguration of local innovation practices and the altering of conceptualization of mainstream innovation. In the case of the proof of concept formalization of the project idea in the Augment case, the urge to formalise and legitimise took over the ambition of creating something new both in terms of the resulting service and in application of methods aiming to support distributed innovation.

The Logic of Situated Innovation Through Participatory Design

In the proof-of-concept iteration of trans-local prototyping we were presented a fixed innovation logic message by the management of the university innovation center, as an attempt to generalize and manage the initiated innovation. Our strategy was the opposite, to redefine the innovation logic messages through practice via negotiations concerning for instance what constitutes entrepreneurial skills and to what degree it is possible to cooperate trans-locally around user driven service design in a heavily competitive setting which is bound by an innovation logic message which puts severe limitations on the creativity.

Innovation does not always make progress. It is heavily dependent on the creative ability to transform tensions into friction which makes the innovation wheel turn. Development happens within a constantly evolving context. From the proof-of-concept phase we learned that there are differing logics of incremental participatory design which are not always aligned with the established mainstream logic discourse.

Trans-local Cooperation and Multi-stakeholder Involvement

The method of applying trans-local prototyping and thus allowing for a multitude of cultural constructions of the imagined service helped when it came to defining the core of the requested service. However, the intended use is situated and adopted to the varying needs of the involved stakeholders. The prototype is, on the Swedish level, becoming part of a national development project as an extension of and development of a more dynamic tool, which will be integrated with a national database presenting general accessibility information of a more static nature. This is the phase four which we now are involved in. There are also on-going discussions with local entrepreneurs on how to refine the service even more in order to make it possible to commercialize. The Spanish partners within the IMMODI project singled out the multimedia-aspects of the prototype and have continued to develop a mobile tool to support accessibility based on augmented reality. The Italian partners have the ambition to arrange more tests with disability groups and to integrate the mobile tool with a municipality portal. These variations are examples of local innovation practices which might not necessarily lead to commercialization processes but hopefully to adapted utilization of the accessibility service based on situated articulation of local needs.

The citizen-driven design aspects in these above listed examples sometimes become peripheral but this does not mean that they are less important, there is rather a shift in focus between being placed in the centre versus relocating on its own terms and creating a new, alternative centre.

Citizen-Driven Design and Inclusive Prototyping

The frictions in the incremental design of the Augment prototype were detected in this analysis by focusing upon and following the path of the prototype. The frictions within the different development processes were partly caused by the different approaches towards participatory design and that were taken up as different positions in a field of available innovation identity positions, i.e. user-centered design, participatory design and most radically, citizen-driven design. All these positions were available within the development cycle of the Augment project. Inclusive involvement of citizens is not possible to accomplish if the innovation project is too much guided by the technology development perspective and traditional software development practices.

We need to explore further what ought to be visible in this kind of service and what methodologies should be used in supporting local development of citizen involvement? We need to pose some provocative questions: If the technical developers had been in wheel chairs themselves, what would the service have looked like then? How can we create a service that provides space for multi-functionality and support this in a robust way? Retracing of our tracks in these rounds of iteration is a way to find out what is traceable in the service which could be used in order to support future development were the focus is on supporting a stabilized product or service.

Inclusive prototyping is not open in the sense that the openness still includes elements of competition between different parties, such as in the case with holding back the source code for Augment in case it still could have a potential of developing into a full-scale service even though it was based on public funding and claimed to celebrate open source by the management and the technical development team during the proof of concept formalization phase of the project.

The software engineering logic took over and dominated the interpretation of innovation procedures in the proof-of-concept work and this caused a heavy capsizing towards a kind of innovation engineering logic which had to be balanced in the project. This means that the incremental innovation logic needs extra support in these kinds of settings in order to secure user driven design of services which in turn is meant to support the end-users own self-organization activities and empowerment as innovators.

The Sleeping Beauty of Innovation

The multi-layered cross-cultural and cross-organizational co-operation caused both tensions and frictions. A possible risk effect of distributed innovation is that the service becomes “a sleeping beauty”, no one really dares to awake it because of the complexity of who really owns the outcome of this trans-local collaboration and who is going to take responsibility for the final service? It was once initiated

as a user-driven initiative, but now runs the risk of ending up as a user-alienated initiative due to the proliferation of a culturally disperse and imaginary best practice which is relying on its methodology of distributed innovation. Along with the distribution of the innovation, also came the distribution of responsibility and how to manage this, an issue which is not really solved yet, and is probably one of the most central issues for successful citizen-driven service design.

The use of trans-local prototyping could, if drawing on the experiences made within the Augment project, function as a commuter, when moving back and forth between the local and the transnational, both in a methodological and a theoretical analytical sense. How to identify needs, frames, and reconsiderations is becoming dependent on both local interpretations and ability to reconfigure the transnational into something local, and also the ability to keep the local when trying to make sense of the transnational context which becomes more and more interwoven with competition in a global world.

In order to achieve renewal of the meaning production concerning innovation, the method of utilizing gaps and frictions in order to promote local innovation by applying a transnational collaboration approach could be fruitful. This strategy could open up the innovation logic towards allowing alternative interpretations of what innovation means. In the Augment case, the transnational collaboration helped to unfreeze power clinches on a local and regional level and to leverage alternative understandings of innovation logic.

Steps Towards a Methodology of Trans-local Prototyping for Incremental Innovation

In order to achieve citizen-driven participatory design of e-government and genuine user involvement the emphasize should be ron renewal of the methods, to go beyond the project to be part of the "new global wild" (Dittrich et al. 2002), but also to be able to accommodate different levels of user involvement over time which may vary between user-centered design, participatory design and a more radical, user driven service design and continuing design in use. We illustrate this trans-local method built on taking care of the interplay of tensions, frictions and flows as deliberative elements within an ongoing trans-global re-negotiation which includes different levels of commitment over constructed borders (Table 5.1).

The final conclusion then is acknowledging that transnational collaboration opens a broader design scene and enhances local innovation by offering the opportunity to repeatedly shift one's gaze from the narrow perspective to the transnational (or rather trans-local) perspective and then back again thus opening up local design spaces for citizen-driven service design.

Table 5.1 Overview of trans-local prototyping

Phases of incremental change	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5 Steps towards renewal of methodology for trans-local prototyping
Actions	R&D cooperation	Proof-of-concept formalization	Exchange of best practices	Commercialization	Opening for new trans-local re-negotations
Benefits	New spaces for PD	Allowed for broader local stake-holder involvement	The service concept was shared and expanded with partner regions in Europe through best practice methodology	General approval	Iteration with a focus on supporting incremental change Expansion of trans-local collaboration
Tensions and frictions	Framework of funding and infrastructure by prototyping "Deep participation"	Need of unification despite conflicting development schemes	Unstable prototypes	Citizens-driven design envisioned as a shift in focus towards keeping the agency and flexibility by continue to apply trans-local prototyping also in this development phase	Capitalization without losing deep participation
Flows achieved	Participatory prototyping spaces	Strong stakeholder inclusion within the formalization process	Acceptance to share methods of flexibility instead of sharing a finished product	Broadening the design scene	Reconceptualization of innovation by including iterative trans-local relocations as part of incremental innovation

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Chapter 6
In the Quest of Opened-Up Governmental Policies in Greece: Challenges and Recommendations

Evika Karamagioli and Dimitris Gouscos

Abstract The chapter describes the key elements of the innovative effort of the Greek public administration over the last 5 years to enable the transition to a new public administration model via opened-up governmental policies so as to improve public services provision, increase public integrity and ensure a more effective management of public resources After showcasing the most representative tools developed so far, the authors will discuss their level of maturity and their potential in light of open data policy requirements.

6.1 Introduction

Open government, defines a new model of government which ensures that all aspects of the way that government and public services are administered and operated are open to effective public scrutiny and oversight. It entails redesigning the way public authorities act and react so as to establishing a new, stronger and better trusted relationship between them, citizens and businesses, enabling public employees to work in smarter and better informed ways but also governments to be open to external ideas and innovation as it is to making their own information and processes open to the public (Centre for Technology Policy Research 2010).

According to OECD, open and inclusive policy making is transparent, evidence-driven, accessible and responsive to as wide a range of citizens as possible. It strives to include a diverse number of voices and views in the policy-making process, including traditional cultures. To be successful, these elements must be applied at all stages of the design and delivery of public policies and services. While inclusive

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policy making enhances transparency, accountability and public participation and builds civic capacity, it also offers a way for governments to improve their policy performance by working with citizens, civil society organizations (CSOs), businesses and other stakeholders to deliver concrete improvements in policy outcomes and the quality of public services (OECD 2013).

Open government as a concept implies the free use, re-use and distribution by anyone of any data and/or information produced or commissioned by public bodies. These data are called open governmental data and are subject only—at the most—to the requirement to attribute the source and share the same way (OECD 2013).

According to the Open Data Handbook, the access, sharing and reuse of public data has a strong social and commercial value as by opening up data, governments can help drive the creation of innovative business and services. Furthermore citizens are enabled to be much more directly informed and involved in decision-making. This is more than transparency: it's about making a full "read/write" society, not just about knowing what is happening in the process of governance but being able to contribute to it (Open Knowledge Foundation 2012).

In spite of the considerable attention that open governed policies in national and international level have received (McDermott 2010) and the many similarities that they may present the level and modalities of adoption differ from country to country (Zuiderwijk and Janssen 2013). Out of all OECD member countries in 2013, the 56% of them has a national open government strategy, the 12% indicated the existence of separate strategies for individual line ministries, and the 28% specified the co-existence of these strategies. Only in the 4% there is a total absence of an open government strategy (OECD 2013).

In the European context in 2012 on average, less than 10% of citizens had reported using the Internet to take part in an online consultations or voting to define civic or political issues (e.g. urban planning, signing a petition). The propensity to use online tools for consultation or voting was highest in the Nordic countries (European Digital Agenda Scoreboard 2012).

In Greece the introduction of open government applications was initiated in 2009 in an effort to advance citizens' participation in decision making while the country was facing the most intense social political and economic crisis of her history that caused widespread public mistrust, civic disengagement, and a deep feeling of disappointment for the inefficiencies of public administration (Karamagioli et al. 2014). This innovative effort to enable the transition to a new public administration model (OECD 2010) involved its first stages the online publication on the central Open government website (www.opengov.gr) of the following: Calls of interest for public service senior positions, Draft regulation (laws, presidential decrees, ministerial decisions etc.) of all ministries for open consultation and calls for on line submission of innovative ideas for issues such as bureaucracy reduction, public services redesign, the environment etc (labs.open.gov section) and then the availability of a restricted number of public data to citizens, enterprises, researchers and different government bodies (mainly geospatial data) and the obligation that made legally compulsory the online publication of all government, local government and public administration bodies decisions, including commitment of funds and financial decisions of the government sector via the Diavgeia programme.

In April 2012 the 1st National Action plan for open government was launched one month after the completion of the drafting of the national strategy for ICT and eGovernment in March 2012 that responded to the obligation to apply community guidelines for the implementation of the Europe 2020 Strategy (a 10-year strategy proposed by the European Commission on 3 March 2010 for advancement of the economy of the European Union that aims at smart, sustainable, inclusive growth with greater coordination of national and European policy) and the priorities of the Digital Agenda for Europe(the first of seven flagships initiatives under Europe 2020 that aims to reboot Europe's economy and help Europe's citizens and businesses to get the most out of digital technologies). The major challenges that the open government initiatives would address according the plan were: Improving Public Services, Increasing Public Integrity and More Effectively Managing Public Resources (National Action plan 2012).

Since 2012 Greece is also partner in the Open Government Partnership (OGP) is a voluntary international initiative that aims to secure commitments from governments to their citizenry to promote transparency, empower citizens, fight corruption, and harness new technologies to strengthen governance. In the framework of this initiative the Greek government has committed its self to achieve a series of open government milestones and proceeded in the self-assessment of the effort realized so far.

Under this angle open government framework is seen as a mean in order to enforce the principles of transparency, participation, collaboration, accountability, effectiveness and efficiency. Focus is given to the qualitative upgrade of the public services through citizen participation and everyday interaction with the public sector along with the efficient management of public resources.

The objective of the present chapter is to showcase the most representative tools developed by the Greek government up to now and discuss their level of maturity and their dynamic while making recommendations for their improvement.

Work Approach and Research Limitations

Taking into consideration that most of the open governmental data applications are under development and/or under improvement, the official performance and users data are not available for most of the applications and so far there isn't any type of evaluation of Greek citizens opinion on them the analysis will be based:

a. On existing governmental resources such as the 1st National Action plan, the self-assessment that the Greek government performed in the framework of the participation in the OGP and the results of two workshops that were organized by the National Centre for Public Administration and Local Government (EKDDA) in cooperation with the Greek Ministry of Administrative Reform and eGovernance on January 30th 2014, entitled "Open Government—Open Data: A Challenge for Growth" and on February 17th 2014 entitled, "Open Governance—Transparency and Public Participation". Both workshops were attended by approximately a 120 executives from about 40 organizations such as ministries, professional

bodies, non-for profit organizations, the academic and research community and other associations
b. Bibliographical resources and the previous research that the authors performed analyzing the case of open consultations as a mean to achieve more collaborative ways of governance and a series of bottom up initiatives over the Diavgeia project and
c. The Independent evaluation report that OGP concluded for Greece in February 2014.

This way of work has faced the following limitations that imply the fields of future research

1. Limited available data on the performance and maturity of the applications
2. Limited time horizon: the opening up of public data is evolving rapidly and the applications have different levels of maturity without any signs of stabilization for the time being. More calendar time needs to be allocated in further research efforts for monitoring them so that we can proceed with comparison on what works and what does not work in the Greek case
3. Lack of knowledge about the citizens own perspectives: what they really want, how they consider the applications so far, what are their needs

E-Readiness and E-Government Readiness in Greece

The success of any open data governmental initiative just like any other eGovernment model depends on a series of quantitative and qualitative characteristics of the population where they are implemented (ie familiarization with internet, educational issues, digital fracture, participation culture, internet penetration etc).

Internet usage within the last 12 months was 61 % in Greece with the EU average being 75 %. Greece is currently ranked 37th out of 190 countries listed in the UN eGovernment development index, and slightly above average in the area of eParticipation. The UN eGovernment Development Index (EGDI) is a composite indicator measuring the willingness and capacity of national administrations of UN countries to use information and communication technologies to deliver public services. The EGDI is a weighted average of three normalized scores on the most important dimensions of e-government: scope and quality of online services, development status of telecommunication infrastructure, and inherent human capital.

The UN eParticipation Index assesses the quality and usefulness of information and services provided by a country for the purpose of engaging its citizens in public policy making through the use of e-government programs. As such it is indicative of both the capacity and the willingness of the state in encouraging the citizen in promoting deliberative, participatory decision-making in public policy and of the reach of its own socially inclusive governance program.

The percentage of individuals using the internet for interacting with public authorities ranged from 13 % in 2008 to 36 % in 2013 (the EU 28 average was 36 % in 2008 and 42 % in 2013). Concerning problems experiences when using eGovernment web-

sites in 2013, the 5% of Greeks is experiencing problems while the EU 28 average is 9%. Concerning user satisfaction about the use of eGovernment websites in 2013, the percentage of Greek that were mainly satisfied by the ease of finding information was 35% and the percentage of Greeks that were mainly satisfied by the usefulness of the available information was 31% (the EU 28 average was 33% in 2013).

As far as the satisfaction and confidence across public services only the 13% of Greeks is expressing it about the national government (40% is the average in the OECD countries) and 38% about the judicial system (51% is the average in the OECD countries). Concerning public officials' asset disclosure, the level of disclosure of private interests and public availability of information by decision makers, it was 63% in 2012 with the OECD average being 51%. Finally the percentage of people who took part in an online consultation or eVoting was 5% in 2012 with the average for OECD being 9%. It is an aggregate of the level of disclosure and public availability of disclosed information by top decision makers in the three branches of government (executive, legislature and judiciary). The levels are determined by whether top decision makers are required to disclose such private interests as their assets, liabilities, in-come source and amount, paid and unpaid outside positions, gifts and previous employment.

Between 2007 and 2012, the decrease of the confidence in government in Greece (from 38% to 13%) was the second strongest within the OECD (OECD 2013). In 2013, Greece scored as the lowest-ranked EU country in an index that measures experts' perceptions of public sector corruption: Greece's low position (80 in this ranking out of 177) is illustrative of the continuation of the crisis of values that is driving the economic crisis although Greece has fallen 14 positions since 2012 (Transparency International 2013).

Clearly the context that open governmental data is introduced and developed in Greece characterized by a the population that lacks behind the EU average concerning the familiarization and usage of eGovernment applications and at the same time there is a strong credibility deficit that governmental bodies are facing.

Growing expectations of open public decision making in European and International level as the appropriate way to address the lack of accountable leadership that most countries are facing worldwide particularly following the financial and economic crisis, have been a major concern for the Greeks authorities effort to restore the trust in government by strengthening citizens—policy makers relation (OECD 2010).

Open Access to Public Data and Public Documents so as to Ensure the Free and Unobstructed Provision of Public Information

Following the European Union's guidelines and recommendation on introducing open government models in the everyday functioning of European governments, the Greek Government has recognized the value of open governmental data mechanisms as the appropriate way to improve the services provided to citizens, ensure governmental transparency and accountability (National Action plan 2012).

According to Neelie Kroes, Vice President of the European Commission, that has praised the Greek effort commenting the initiation of the portal data.gov.gr "In today's world, public data is the new oil; the fuel for innovative applications and economic growth. And open data portals are a key component of an overall strategy for making public data more accessible and re-useable. The right policies on open data can stimulate smart growth in our knowledge economy, making government data more easily available, and usable as a basic resource for value-added services. And open data can also help modernise public services, boosting transparency and efficiency" (Kroes 2013).

In this context the Greek public administrations effort is to ensure the free availability of data that she generates, collects and manages and that concern the economic and social life of citizens. This way citizen can be provided with a useful insight of the way the public sector is functioning and they are given the means to take up those data and transform into meaningful applications and services that have measurable positive effects on real people's lives, inspire innovation and stimulate financial growth (National Action plan 2012). Under this objective the innovative open data mechanisms introduced so far are:

eCatalogue of Public Data

- A centralized collection and distribution directory of available open datasets of all public bodies of Greek government through is offered via www.data.gov.gr. Datasets are available with open licenses, allowing further use without restrictions and without cost. At this stage it is an experimental work in progress that includes 38 sets of public data (financial data, construction activity, culture and tourism, education and research, prices of products and services, efficiency of public services).Open data regarding prices (including fuel prices) are also collected by the Prices Observatory and are also available from the web site http://services.e-prices.gr.

Open Taxation Data

Concerning taxation data the General Secretariat of Information Systems (GSIS) webpage www.gsis.gr is publishing information on debtors by name and the amount past due (data with limited utility). The General Secretariat of Public Revenue (GSPR) website www.publicrevenue.gr is publishing the detailed objectives of recovery of arrears, the objectives of audit and revenue from large businesses and individuals of great wealth as well as the corresponding results and last but not least the data from the performance of the taxations offices. The update is monthly and currently presents the aggregated data from all regional tax offices. Detailed information on the monitoring of VAT refund requests that are sent to the regional tax offices. The information is updated on a weekly basis, and is concerning the process-

ing of applications for VAT refund per regional tax office. In fact, the three regional tax offices with the greatest positive changes (improved throughput) and the three regional tax offices with the greatest negative changes (deteriorated throughput) are published (OGP, Greek Self-Assessment report 2013).

Free Geospatial Data

Geodata.gov.gr was designed, developed, and is maintained by the Institute for the Management of Information Systems of the "Athena" Research and Innovation Center in Information, Communication and Knowledge Technologies, with the aim to provide a focal point for the aggregation, search, provision and portrayal of open public geospatial information repository and begun its operation in 14/8/2010. Geodata.gov.gr provides technical support to the National Spatial Data Infrastructure, in accordance to the National Strategy for ICT and eGovernment. Up to now it had 330,000 unique visitors from 109 countries, 1000 unique daily visitors, 350 GB of geospatial data, 179 available datasets, 18 TB data served. The 50% of the use of geodata.gov.gr is made for business related activities and the direct savings for the public sector reach the 20 M Euros (Institute for the Management of Information Systems "Athena" Research Center 2012).

Issues that remain to be resolved although there has been some legislative modifications include the operation and management of the website www.geodata.gov.gr and the right of use of the domain name space remain pending, the free sharing of geospatial data with other public authorities or the disproportionately restrict access and further use of geospatial data. (OGP, Independent Reporting Mechanism Greece 2014).

Online Publication of Public Sector Procurement Information

The publication of information on the whole procurement cycle, of all public sector bodies, is available at www.agora.gov.gr It is a subsystem of the electronic platform for the operation of public pro-curement (www.eprocurement.gov.gr) that supports electronic submission of bids, electronic auctions and implementation of framework agreements capturing the planned public contracts of the broader public sector and local authorities (Municipalities and Regions). The scope of the application is the entire spectrum of procurement of goods, services and works over € 1000 concluded in writing, by electronic means or orally, at every stage (from the request of the Contracting Authority to the payment order) and independently of the procurement procedure. From February 2013 until August 2013, 118,332 procurement claims had been registered.

Future development include the Registries interoperability with systems in the public sector to simplify procedures, reduce bureaucracy and administrative costs and facilitate business participation in tendering procedures for public contracts as well as the implementation of a system for drawing conclusions regarding the struc-

ture and functioning of the markets with which transacts the Public Administration and its systematic use for policy making on public procurement in the country (Greek Self Assessment Report 2013).

Transparency in the Functioning of the Public Administration: The Diavgeia Project

The enhancement of transparency in the public sector's decisions and actions is considered as a remedy to the perceived lack of citizen confidence towards the government and as the appropriate mean to increase accountability of the public servants and decision makers. Beginning October 1st 2010, all Greek public institutions, regulatory authorities and local government have the obligation to publish all their decisions on the Internet in order to be valid for execution with the exception of decisions that contain sensitive personal data and/or information on national security. The technology implementation model of the program established by (law 3861/2010) is based on an agile strategy embracing the principles of open con-tent and open architectures. Each document is digitally signed and assigned a unique Internet Uploading Number (IUN) identifier, certifying that this document is published online and serving as a unique reference for retrieving it. This innovative program, even by European standards aims primarily to bring about the maximum publicity to government policy and administrative actions through wide publicity and access to information, reinforce the responsibility and accountability of public bodies and public officials (Greek Action plan 2012).

Through this program citizens are able to exercise fully their constitutional rights, as defined in article 5 and 5A that provide for the right to information and the right of access to the sources of information and establish the right of participation in the Information Society and the right of persons to access digitally transmitted information. In practical terms via Diavgeia the interested parties are able to search for acts and decisions of the Ministries and other public institutions by using keywords and thematic meta-data, with which every act is registered.

In September 2013, there were 4070 affiliated bodies in Diavgeia, the number of published decisions was 9,231,929, active users were 32,775, the total amount of expenditure posted online was 63,574,705,473 €. Monthly traffic was 247,043 visits and 6,156,358 hits.

The implementation problems that were identified up to now concerned system performance and the searching function (due to the substantial increase in the number of users and data). Current upgrades mainly concerns the development of the second generation system, with faster response times, increased availability and many new features that make the system "citizen-centered" ensuring effective citizen service, the cleansing of data (a process of checking and cleansing gathered data is planned to start in order to facilitate users' search functionality) and the simplification of document circulation procedures of government entities. Based on the new legislative provision, the uploaded electronic documents have the same valid-

ity as the originals, reform that would allow the exclusive documents circulation of documents via the Transparency Portal. (OGP, Greek Self Assessment Report 2013; OGP, Independent Reporting Mechanism Greece 2014). As far as the use from the public authorities in the beginning the resistance and questioning about the potential value for the public administration was raised by the public officials, claiming that such a mechanism would only add burden to their already overloaded work prorgamme. Such resistance seems now to have been minimized and public officials are supporting more and more the mechanism (Karamagioli et al. 2013; EKDDA 2014b).

Reinforcement of Public Participation in Governmental Decision Making Processes

We refer to the online consultations of legislatives acts to be adopted available via www.opengov.gr. From October 2009 to September 2013, 358 consultations took place, gathering 99,750 comments. The texts that were submitted for consultation concerned the Legislative 52% the Pre-Legislative 27%, and Others 23%.Since 2010 revision of the Standing Orders of the Parliament, every proposed legislation submitted must also be accompanied by a report on the results of the public consultation that took place prior to this submission. The mean duration of consultation was 18 days (3–71 days), the mean number of comments per consultation: 278 (0–13,741 comments), the median of the number of comments per Consultation: 80, the mean number of consultations per month: 7.5 (1–11 months), declining during July and August (OGP, Greek Self-Assessment report 2013).

So far what is seen is that citizens consider an online public consultation system very useful, especially today, they have reservations if their opinion and comments are taken into account during the formulation of legislation. However the exclusion of certain groups of persons with disability from the consultation process since the eConsultation platform has not implemented the necessary accessibility procedures and tools needs to be mentioned. The average consultation time is much less than the statutory. A high percent of bills are given for consultation in their final stage. Almost 50% of the number of consultations is about final stage bills and not pre-legislative texts. There is no common and rigorous mechanism in place, to ensure that citizen comments and suggestions are fully utilized. This reduces citizen motivation to participate in future consultations. Furthermore there is no possibility of moderation of the comments. The texts are too long and frequently very technical or the language used is difficult for the average citizen to understand. Most of the times there are no supporting explanatory documents (OGP, Greek Self Assessment report 2013; Karamagioli et al. 2014; OGP, Independent Reporting Mechanism Greece 2014; Gouscos and Staiou 2010). Finally there is no standardized official procedure to inform citizens about the opening of the consultations.

Discussing the Greek Open Data Effort in Light of Open Data Policy Requirements

In spite of attention given to open data policies worldwide, research is an early stage and there is no available framework for comparing open data policies on a broad range of aspects (Zuiderwijk and Janssen 2013). Our analysis will therefore be based on a series of set of principles developed over the last years.

In 2007, December 7th and 8th, 2007 30 open government advocates gathered to develop a set of principles of open government data. The meeting, held in Sebastopol, California, was designed to develop a more robust understanding of why open government data is essential to democracy. The group is offering a set of eight fundamental principles for open government data. By embracing the eight principles, governments of the world can become more effective, transparent, and relevant to our lives. Government data shall be considered open if it is made public in a way that complies with the principles below:

1. Complete. All public data is made available. Public data is data that is not subject to valid privacy, security or privilege limitations.
2. Primary. Data is as collected at the source, with the highest possible level of granularity, not in aggregate or modified forms.
3. Timely. Data is made available as quickly as necessary to preserve the value of the data.
4. Accessible. Data is available to the widest range of users for the widest range of purposes.
5. Machine processable. Data is reasonably structured to allow automated processing.
6. Non-discriminatory. Data is available to anyone, with no requirement of registration.
7. Non-proprietary. Data is available in a format over which no entity has exclusive control.
8. License-free. Data is not subject to any copyright, patent, trademark or trade secret regulation. Reasonable privacy, security and privilege restrictions may be allowed.

Additional principles issued from the Sunlight Foundation Open Data Policy Guidelines include the need for open data be online in a permanent way and & free of cost (or at least no more than the marginal cost of reproduction). Data should be made available at a stable Internet location indefinitely and in a stable data format for as long as possible. Documentation about the format and meaning of data is also necessary. Finally open government data need to be designed with public input. According the Sunlight foundation the public is in the best position to determine what information technologies will be best suited for the applications the public intends to create for itself.

The Association of Computing Machinery's Recommendation on Open Government in February 2009 mentioned that the published content should be digitally signed or include attestation of publication/creation date, authenticity, and integrity.

David Eaves has set out The Three Laws of Open Government Data:

1. If it can't be spidered or indexed, it doesn't exist
2. If it isn't available in open and machine readable format, it can't engage
3. If a legal framework doesn't allow it to be repurposed, it doesn't empower

Finally Tim Berners-Lee, the inventor of the Web and Linked Data initiator, suggested in 2012 a 5 star deployment scheme for Open Dataproposing to organizations the following actions in order to ensure the success of such initiatives

1. Make data available on the Web (whatever format) under an open license
2. Make it available as structured data (e.g., Excel instead of image scan of a table)
3. Use non-proprietary formats
4. Use URIs to denote things, so that people can point at the data that are opened
5. Link the open data proposed to other data to provide context

The aforementioned sets of guidelines point out to the need for open government information that should be complete, objective, reliable, relevant, and easy to find and understand in order to achieve their double scope (a) ensure that the policy making process is open, transparent and amenable to external scrutiny can help increase accountability of, and trust in, government and (b) strengthen active citizenship and civic engagement in political processes.

As far as Greece is concerned we see that although there are important steps are made there is a long way to go. The Action plan constitutes a promising start along with the participation in the OGP procedure however there are a series of barriers that need to be overcome that have to do with organizational, technical, cultural, legal issues (EKDDA 2014a).

Major concerns include on the one hand that the implementation of the law 3979/2011 that allows electronic filing of Freedom of Information Requests (or Access to Information Requests), makes the procurement of Free/Open Source Software (FOSS) mandatory for the public administration and provides a framework for the opening up of public data by public sector bodies is weak as the necessary ministerial decrees have not been issued yet (Tsiavos 2012) and on the other that the public is not well-informed, there may not be enough citizens who are motivated to engage in public policy deliberations and who are capable of doing so, most public participation may come from special interest groups, open government applications are considered from the public officials end to cause delays in government action. The resource requirements (dedicated employees, work hours) are not always available especially nowadays due to the cuts in the public sector and there are legal constrains and "dark" areas (EKDDA 2014b).

The single most important innovation of the Diavgeia program of the Greek government may well be its holistic approach towards the objective of electronic government. Diavgeia constitutes one of the rare examples in Greece in which an

eGovernment project is not conceived around a mere ICT system, but rather around a combination of closely interrelated legal frameworks, operational processes and technological instruments. These elements differentiate the Diavgeia program from similar public initiatives in international and European level. The key factors for success of Diavgeia, as cited in the literature, include the following (Tsiavos et al. 2012):

a. Launch of the system has been a very quickly and well-executed operation, with specific limits on budget and time for completion;
b. The project has received political support at the top level, also due to the fact that its main features and offering were easy to grasp;
c. The legal framework did not require any further layers of regulatory instruments to be put in place;
d. The technological platform of the project was almost immediately available after its legal platform was complete; and
e. The project addressed a real social and political issue.

Until now, free access to information is guaranteed constitutionally in Greece and provided by law. But what finally finds the essence of the right is not only the legal framework but also the organizational and technological choices which implement it. Government needs to be more agile in making use of modern technologies. Cultural and economic investment is going to be required to move the existing professional and technical capabilities of the civil service to the necessary levels. There is also a significant political dimension to the routine disclosure of all public information pioneered direct citizen participation and feedback during the formulation of policy feedback mechanisms to improve services (Zuiderwijk and Janssen 2013).

Some of the potential blockers to achieving open government in the case of Greece include: the poor quality of some existing data—and the associated fear of exposing it to wider public scrutiny, the lack of interoperability between the authorities, the inexistence in other cases of data, or the nonconformity of their formats, the lack of a clear point of ownership of data, the pushback from civil servants, the reality that public data cannot always necessarily be effectively anonymised, with the potential for aggregated data to lead to invasions of personal privacy, the need for open data to be available in a permanent way, the lack of training manuals and supporting aid tools for interested parties to re use the data, the lack of a holistic communication strategy about the added value of open government applications for the everyday life, the need for a series of organizations changes that go hand in hand with the introduction of open government mechanisms last but not least the lack of open government culture (EKDDA 2014a, b) in the way governmental agencies are providing their services and the way citizens and other interested parties interact with them.

Clearly Open government is not about technology, but about politics. Openness should be applied to processes not just technology. Many of the public sector's overly complex business processes are the cause of inefficiency, and have a knock-on effect in terms of how well IT can assist the operation and admin of public services removing the wider culture of information being "closed by default" in the civil service will take time and strong political will. The release of public data needs to be a routine by-product of everyday processes, not a burdensome for civil servants. Therefore government should take advantage of better approaches, collecting and keeping as little personal data as possible: the bare minimum needed to deliver public services. Significantly less personal data is often required than is generally assumed. This is not a technical issue. It's about a culture that has often forgotten that personal data is the citizen's private information, not the government's (Centre for Technology Policy Research 2010).

6.2 Concluding Remarks

Open data initiatives have by definition a social and political aspect, challenging governmental authorities in the way they can engage with constituents. The different ways of presenting, combining and analyzing open data from government organizations and other public sector institutions lead to new civic attitudes, different expectations and behavioral patterns in the way governmental action is perceived and evaluated.

It is clear that public sector organizations by providing open data will have to deal with their unplanned or unintended use, which can and will challenges established policies and processes. Web 2.0 technologies provide the tools for that, but need to be considered alongside with appropriate processes.

It should become a two-way exchange. In the same way that the Internet was designed to be open by default, government too needs to redesign itself to be open by default. But it will take a strong political will and the implementation of a series of practical steps to get there. So as to ensure the technological, political and cultural shift

Or the success of putting government decisions to public scrutiny through open data services is governed by socio-economic variables. Educational issues, motivational structures and specific political conditions are all factors likely to affect citizen engagement and input in this process.

Until now, free access to information is guaranteed constitutionally in Greece and provided by law. But what finally finds the essence of the right is not only the legal framework but also the organizational and technological choices which implement it.

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Chapter 7
Towards the Understanding of Success in E-Participatory Budgeting Projects

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Abstract During the last years e-Participation initiatives have been launched by many countries and e-Participatory Budgeting (e-PB) is one of them. e-PB includes the use of Information and Communication Technologies (ICTs) in democratic decision-making processes regarding the spending for a defined public budget where ICTs are used in order to enable more citizens to participate. In this study we investigate which the success factors (SFs) are for implementing e-PB projects and if they are actually used in practice. For that purpose a literature review identifying success factors was undertaken, followed by case studies at three Swedish municipalities that have implemented e-PB. Our findings show not only that the eleven SFs mentioned in previous research are met in practice in most cases, but also that additional factors arise in practice. The additional success factors relate to: size of budget, size and spectrum of target group participants, design of proposals, theme area of the budget, and civil society's involvement. Our study also revealed that just the "e-dimension" by itself does not ensure success or increased participation.

7.1 Introduction

Citizen engagement in decision-making processes is recognized as an urgent need by governments and international organizations (OECD 2001), but many European Union (EU) citizens feel that their concerns and opinions are not being listened to or acted upon (EC 2010). Against this backdrop EU and its member states have started several e-Participation initiatives at both national and local level (Momentum

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I. Boughzala et al. (eds.), *Case Studies in e-Government 2.0,*
Changing Citizen Relationships, DOI 10.1007/978-3-319-08081-9_7,

2009). Additionally, during the last years there is a lot of discussion on Government 2.0. According to O'Reilly (2009) it is all about using e-Government as platform surrounded by Web 2.0 technologies allowing thus the creation of innovative, citizen-oriented services, sometimes even by the citizens themselves. E-Participation could therefore be regarded as one of Government 2.0 aspects. By using Web 2.0 technologies in e-Participation initiatives the hopes are to increase participation and to improve the democratic practices (Chang and Kannan 2008; PACE 2008; Tambouris et al. 2012). Whereas the use of computers as support for decision-making is nothing new, the advances made in technology, accompanied by an accumulated knowledge in the fields of decision theory, cognitive science and information science, have made it possible to use ICTs in "more expansive 'advisory' roles to the decision making" (Saunders-Newton and Scott 2001). E-Participatory Budgeting (e-PB) is one of these initiatives which are applied at municipal level and it is said to be of great promise for enhancing direct decision- making processes.

e-PB is the next step of Participatory Budgeting (PB) projects. PB can be defined as "a direct, voluntary and universal democracy where people debate and decide on public budgets and policy" (Global Campaign on Urban Governance 2004), but for e-PB there is no commonly accepted definition. The terms "e-PB", "online PB" and "digital PB" are used by researchers and exist in municipal documents (Peixoto 2008; United Kingdom's Participatory Budgeting Unit 2007). For the purpose of this study we give the following definition of e-PB which is mainly based on the terminology used by United Kingdom's PB Unit (UK PB Unit) and Peixoto (2008): e-Participatory budgeting is the use of ICTs in the democratic decision-making processes on the priorities and spending for a defined public budget to reinforce accountability at local and regional level by adding value and not replacing the traditional face-to-face Participatory Budgeting processes.

In believing that ICTs and especially Web 2.0 technologies have the potential to increase citizen participation we need to investigate how we make these projects successful. Consequently, it is important to study the experience that comes from cases where PB and especially e-PB have been implemented in order to guide future implementations. According to Codagnone and Wimmer (2007) research that belongs under the umbrella of e-Participation, citizen engagement and democratic processes theme should focus on the development of an e-Participation public value measurement framework during the years 2009–2015. Since e-PB is under this umbrella, with this study we believe that we will contribute towards this direction. Recent studies on deliberation systems implementation (Rose and Sæbø 2010) and on PB/e-PB (Paganelli and Giuli 2010; Paganelli and Pecchi 2013; Scherer and Wimmer 2012) show that research efforts in the field are moving towards the identification of models and guidance regarding e-PB implementations. Their study, as well as the plethora of case studies and recommendations, imply the need to clearly summarize and determine on what makes e-PB projects successful. As research on PB covers already a great aspect of issues it remains to investigate if e-PB differs from PB in terms of project success and where to pay attention when we will try implement e-PB projects in the future.

Therefore this study aims to find out which are the success factors (SFs) for implementing e-PB projects. We investigate this by identifying SFs in existing literature and by undertaking case studies in three Swedish municipalities that are

running e-PB projects. In this paper we regard the success as engagement and increased participation. "Engagement" according to the definition of Caddy et al. (2007), is the ultimate objective of the "Social Accountability" initiatives relevant to the decision making processes. We also adopt Cooke-Davies (2002) perspective of project success (distinguishing it from project management success) and success factors (in contrast to the concept of success criteria): "project success measured against the overall objectives of the project" and success factors "those inputs to the management system that lead directly or indirectly to the success of the project" (Cooke-Davies 2002).

Sweden is an interesting unit of analysis because it has a long-standing tradition of citizen engagement in decision-making processes (The official site of Sweden 2014). Additionally, the Internet use in the country is one of the highest in EU (Seybert 2011) and the use of ICTs is included in the political agenda for innovative ways of participation (Coleman and Gotze 2001).

The remaining of the paper is organized as follows: The second section describes the methods used. Then, we describe the three municipalities under study. A presentation of the results (literature study and case study) follows. Thereafter, the results are discussed and conclusions are drawn.

7.2 Research Approach

Two different research methods were used in the study: literature review and case study.

The state and local authorities in their effort to intervene and create a comprehensive reform to society are particularly interested in case studies and especially on how to evaluate interventions and policies to be able to take actions (Yin and Davis 2007). Among others, such actions include engaging citizens and the public at large in meaningful roles (Yin and Davis 2007). The importance of a rigorous case study as well the need for more and of better quality case study research is highlighted by many researchers, e.g., on Gibbert et al.'s work (2008) and Flyvbjerg (2006). These reasons were a motivation for us to use case study.

Case study as a research method is usually used when we try to answer a question of "how" regarding a contemporary set of "events" over which the investigator has little or no control (Yin 2009). In our case the contemporary set of "events" includes "events" strongly connected to the implementation of e-PB projects. Since we try to give an answer to the question of how e-PB projects are implemented and how we could make them successful, case study method was considered appropriate. Using case study, we were able to describe and explain the phenomenon of pioneering e-PB projects in Sweden. Since case study as a method relies on multiple sources of evidence it ensures triangulation. Moreover, such a method benefits from the prior development of theoretical propositions to guide data collection and analysis (Yin 2009). Therefore, case study was considered to be a suitable method after the literature review we conducted. Based on the literature review we developed propositions. The propositions were used as a guide during our data collection. We

collected data from various sources in the swedish municipalities under study. Our data analysis was also based on the propositions.

The type of case study design we followed is based on Yin's (2009) 2 × 2 matrix and corresponds to the type of multiple case design. The argument for this design is that we were interested to study e-PB projects and we did so by looking at three case-municipalities. In general, we adopted the traditional view on case study as a methodological choice (Yin 2009; Yin and Davis 2007; Creswell 2012) in contrast to Stake's point of view who considers case study as a choice of what is to be studied (Stake 2000).

Literature Review

The literature study of this paper includes scientific papers and documents published by municipalities, research centers and national and international associations and organizations. For this study the authors used two search engines: Google Scholar and ELIN@Örebro. Google Scholar has become a powerful online citation analysis tool during the last years (Kousha et al. 2010) and ELIN@Örebro is an electronic library which includes 14 academic databases[1] and several thousands of journals in our field. In order to cover as many relevant papers as possible, the literature review included research on both e-PB and PB (not specifically using ICT). The selection of key words is based on the definitions and the scientific field that e-PB belongs to and they were used in isolation as well as in combinations: "Participatory Budget", "Budgeting", "online", "digital", "citizens", "engagement", "decision-making", "processes", "projects", "case studies", "eParticipation", "local governance". The selection criteria of papers and reports were firstly based on title and abstract. We also assessed the origin of the papers where first priority was given to scientific documents. However, because there has not been a lot of research in the field of e-PB, research documents published by research centers and well known international socioeconomic organizations were also included (e.g.: EU, UN and OECD).

The search of the literature study finished when there were repetitions in the search results, i.e., when we had reached a level of saturation. This means that when the same success factors appeared again and again the searching came to an end.

Case Study

Swedish Association of Local Authorities and Regions (SKL) has created a network to coordinate the efforts of Swedish municipalities to launch PB projects. By the time of interviews taken there were only three municipalities that were implementing PB and e-PB projects: Örebro, Uddevalla and Haninge. Örebro did not use advanced technologies in the decision making process and preferred to use them in a future run. However, because they had this in mind, we regarded their insights fruitful and their case worthy to study as well.

[1] e.g., ABI/Inform, Blackwell Synergy, Ebsco, Emerald, Sage, ScienceDirect, SpringerLink and Wiley.

We gathered background information for each case from the project documentation as well as from interviews. The documents could be municipal documents, presentations used to promote the projects, leaflets and brochures. Moreover, at the point the study was conducted we had access to web pages relevant to the project, blogs or online discussion forums.

In order to get an overall picture of the projects (the beginning, the end, the challenges, success factors and so forth) we decided to interview the project leaders and their assistants, four in total. The interviews were semi-structured, lasted between 50 and 100 min, conducted in English language and concerned the following themes: the investment budget, duration of PB projects, stakeholders, processes, problems, success factors, and visions for the future about e-PB projects. The interviews were conducted by personal meetings between the first author and the project leaders. Notes and recordings were kept during each interview with the consent of all the interviewees. The questions were sent to the interviewees in advance, and served as a ground for discussion.

Analysis

For the analysis of the data, each document derived from the literature review was studied thoroughly and what was considered to be a success factor was kept in a list. There were cases where a success factor was mentioned directly in the text but in the most cases success factors were implicit. Each document revealed a list of factors. Thereafter, the similar factors were grouped as they are presented and described in Table 7.2. Based on these factors we ended up with 19 propositions for PB/e-PB project success.

For the analysis of interview data we used OECD's and World Bank's Institute study about social accountability (Caddy et al. 2007) as analytical tool. This study examines social accountability of initiatives in 40 countries according to their ultimate objective, which in the case of PB and e-PB initiatives was "engagement" (Caddy et al. 2007). Therefore the results categorized according to the parameters mentioned in that study. As it is mentioned in introduction section success was considered as engagement and increased participation.

7.3 Introduction to the Cases

Örebro municipality In Örebro, it was the city's executive committee (CEC) that decided to run an e-PB project. Under city's executive committee there are steering groups. The decision for the subject was made "traffic and environment" and it came from the steering group called "democracy and civil society" after discussions with the PB project group. The CEC had to confirm that proposal. After that, the project group was responsible to plan, find out how to run the project and finally how to implement it. The target group was students of the second grade of high

school (three schools took part). Student involvement in the project started with a meeting in the Town Hall where the project was described to the students. Then students had to work on their proposals as part of their course syllabus and they had a time frame. Under the period during which the students had to prepare their proposals they could ring or send e-mails to the members of the project group to ask them questions and receive assistance about the cost estimates of their suggestions. Students presented their proposals and voted internally in their schools. After each school had ended up with one proposal, all students were gathered again in the Town Hall in order to vote. The students decided on how to vote and each student could vote on one of the three proposals. The winning proposal received two-thirds of the votes.

Haninge municipality Based on the SKL (Swedish Association of Local Authorities and Regions) suggestion, Haninge municipality decided to run an e-PB project. The "democracy group" of the municipality (with representatives of the all political parties) decided to start the project. The subject of the proposal was the city's park. The democracy group assigned the project to an external consultant who was to become the project leader. In order to plan the project, the she invited many different organizations from civil society to get ideas. One theatrical group and a youth organization responded. Citizens did not decide on how they would like participate. Politicians had already made a time frame for the PB project and the project leader had to work and plan according to that. At first there was a communication campaign. Citizens started to get involved by the time they had to send their proposals. Before the deadline for submissions an open event took place where citizens could get informed, ask questions and participate in workshops. 101 proposals were received. Thereafter they were grouped into 21 groups that were announced on project's web page. Citizens could get informed, ask questions, log in and discuss on the proposals as well as vote on line. In the last day Internet access points were available in public places were citizens voted online with the assistance of civil servants.

Uddevalla municipality Uddevalla initiative did not start from SKL, but was a part of an EU funded project called "Meeting point citizens" (MSM). The municipality asked the youth council (YC) to participate in the project from the planning phase. The YC decided the age of the students, the details of the process and how they wanted to vote. The YC made the decisions but the project group was in continuous cooperation with it. A political committee accepted their proposals. The project group sent a letter to every teacher with examples on how to work with this project in their schoolwork. The members of the youth council visited each school, informed and discussed with the students, and thereafter an opening meeting and press release was held. In another meeting students could come with their proposals. The whole project group was present and available to answer students' questions. The students submitted their proposals via e-mail. 21 proposals were received and the similar ones were grouped. In a following meeting those who had handed in the similar proposals were asked if they agreed to make them one and if they would be comfortable to work together. They had 2 weeks to refine their proposals. An exhibition of the final proposals took place for one and a half week. The students voted online. The results were announced on the Internet and a press release took place.

Table 7.1 presents a summary of case study characteristics.

Table 7.1 Summary of case study characteristics (the budgets are in SEK (Swedish Kronor))

	Örebro	Haninge	Uddevalla
Population	~130,000 inhabitants	~76,000 inhabitants	~50,000 inhabitants
Duration of the projects	~1.5 years	~1 year	~2 years
Target group	Students 16–17 years	All the citizens of Haninge	Students 13–19 years
Investment budget	250,000 SEK (municipality's total investment budget: 417,000,000 SEK)	400,000 SEK (municipality's total investment budget: 173,936,000 SEK)	200,000 SEK Funded by European Union
Operational budget	~20,000 SEK	~170,000 SEK	10,000–15,000 SEK
Subject	Traffic and environment	City's park	"Uddevalla: a better place for young people"
Objective	Involve students in decision-making processes	Not very clear	Increase citizen engagement; increase the role of the youth council. (Collect at least 10–20 proposals)
Project group	Project leader and 5 persons from 5 different departments: infrastructure, environ. & nature, city planning, traffic security planning and 1 economist	Project leader, a political secretary and 1 secretary from the democracy group. Occasionally 6 people mainly from the Park depart; culture and leisure departments	5 persons of "democracy committee" (politicians), 6 civil servants (from different departments) and 2 projects leaders
Final proposals	3 in total	22 in total	6 in total
Campaign	Press release, leaflets and brochures, information on the internet	Posters, flyers, ads in press, web site, a starting event including slide show and workshop	Press release, emails, leaflets, brochures, posters, web site, videos, Facebook group, blog, presentations and discussions

7.4 Success Factors

The search on the online data bases described above generated 29 documents[2]. The literature review of these documents revealed 11 success factors for the implementation of e-PB in a municipality. These are factors classified into three groups. The first group consists of factors that are related to people, the second group consists of factors relevant to politics and the third group includes technology related factors (Table 7.2).

[2] The references mentioned in the table are not exhaustive. For further references please contact the authors.

Table 7.2 Success factors according to the literature

Groups	Factors
Group 1: People related factors	Experience (Sintomer et al. 2008) Time (Allegretti and Herzberg 2004; Roeder et al. 2005; United Kingdom's Participatory Budgeting Unit 2009a; CLG 2010) Evaluation (Allegretti and Herzberg 2004; Caddy et al. 2007) Communication Campaign (Allegretti and Herzberg 2004; Roeder et al. 2005; Keskinen 2004; Phang and Kankanhalli 2008)
Group 2: Politics related factors	Local government perception of democracy and political/administrative system (Unit 2007; Sintomer et al. 2008; Alonso 2009; United Kingdom's Participatory Budgeting Unit 2009b; He 2011; Keskinen 2004) Vision, Objectives, Goals (Caddy et al. 2007; Peixoto 2008; CLG 2010; Phang and Kankanhalli 2008) Rules (Caddy et al. 2007; CLG 2010) Commitment (United Kingdom's Participatory Budgeting Unit 2007; Sintomer et al. 2008; United Kingdom's Participatory Budgeting Unit 2009b; Alonso 2009; Panopoulou et al. 2009)
Group 3: Technology related factors	Online Platforms (Roeder et al. 2005; Alonso 2009; United Kingdom's Participatory Budgeting Unit 2009a; Paganelli and Giuli 2010; Ferretti and Lener 2008; Keskinen 2004; Phang and Kankanhalli 2008; Märker et al. 2002; Allegretti and Herzberg 2004) Accessibility (Peixoto 2008) Integration of online process with the traditional ones (Allegretti and Herzberg 2004; OECD 2001, 2003)

Experience P1: The experience the local government and citizens have in decision-making processes and especially in PB is positively related to e-PB project success. P2: Citizens' experience in discussing local issues online using a community portal or social networks is positively related to e-PB project success.

Time Firstly, time refers to the time of planning phase. Secondly, it can be the time the citizens start to get involved in the process. Thirdly, it can be the time needed for the development and testing of the software tools and finally it can be what we can call the big "window frame" for the voting process (the time between the announcement of the final proposals and the voting). Therefore, we propose: P3: The earlier the planning phase starts the better for the e-PB/PB project success. P4: The earlier the citizens start getting involved in the process the better for the e-PB/PB project success. P5: The sufficient time devoted for the development and testing of the software tools is positively related to e-PB project success. P6: The big "window frame" for the voting process is negatively related to e-PB/PB project success.

Evaluation After the end of an e-PB it is important to take the feedback from the people involved to the process and mainly the citizens. It creates trust and ensures transparency. P7: Evaluation of the project is positively related to PB/e-PB project success. P8: Publishing both the results from the decision making process and the results of the evaluation is positively related to PB/e-PB project success.

Communication campaign P9 The use of multiple channels and different ways of communication is positively related to e-PB/PB project success. Events and development activities such as workshops both attract people and help them learning about the decision-making process. Online availability of greater and deeper information was mentioned also many times in bibliography.

Local government's perception of democracy and political/administrative system The way each government perceives the concept of democracy affects the implementation of PB. Also, the political/administrative structure of a municipality plays an important role because bureaucracy, the multiple levels of committees and the way they are organized involve risks such as delay and corruption. P10: Bureaucracy and the multiple levels of committees involved in the projects are negatively related to e-PB/PB project success.

Vision, objectives, and goals This factor refers to the formulation of clear objectives and goals as well as to the existence of a clear vision about what local government wants to succeed with e-PB and if it is shared by all the different stakeholders. P11: The existence of clear objectives, goals and vision shared commonly by all stakeholders is positively related to e-PB/PB project success.

Rules Setting clear rules prevents frustration among participants. These rules should specify procedural aspects, rights and duties of participants. Clear rules are very important when technology and online tools are used in the process. Moderation and specific rules in the discussion forum are also necessary for the implementation of e-PB. P12: Setting clear rules for each different stage of the process especially when ICTs are used is positively related to e-PB/PB project success.

Commitment This factor refers to commitment building among the different stakeholders: politicians, public servants, project leaders, citizens etc. It can be commitment (1) to the provision of the funding; (2) to offer clear information to the citizens; (3) for consultation provision; (4) to participation in the decision-making processes. P13: Stakeholders' level of commitment to the project is positively related to PB/e-PB project success.

Online platforms P14 Testing the online platforms before the use is positively related to e-PB project success. P15: E-voting and active online discussion forums are positively related to e-PB project success. P16: User-friendly and at the same time simple interface is positively related to e-PB project success. P17: Software that ensures data protection is positively related to e-PB project success. Some indicators of success when online software is used are the number of users registered on the forum, hits on the web site, hits connected directly to the forum, and voters' turnout.

Accessibility This factor refers both to citizens' access to the Internet but also to their ability to use it. The provision of Internet access points by municipalities enhances their participation on the processes of e-PB. P18: Online accessibility is positively related to e-PB project success.

Integration of online process with the traditional ones Only citizens' online participation is not considered success for an e-PB. Face-to-face procedures are

regarded necessary prerequisite for e-PB. P19: Integration of online process with the traditional ones is positively related to e-PB project success.

Success Factors in Practice

Having developed 19 propositions based on previous research on success factors we will now use them for discussing the findings of the case studies:

As these municipalities were the pioneers in PB and e-PB projects in Sweden, they had a few experiences in decision-making—but in Uddevalla they had implemented projects for citizens' engagement founded by EU before. The target groups in Örebro and Uddevalla had little experience of online discussions about local issues since they consisted of students exclusively (local issues and politics are usually not of that much interest of teenagers). On the other hand Haninge's target group was really broad, so, according to the project leader, there were citizens that were used to having online discussions about social and political issues, however, not only limited to local issues.

The planning phase of the PB project was really long in Örebro municipality (approximatelly a year). As a result, the project team was well prepared about what they were going to do, who they wanted to involve and how they could handle the result of their involvement. Therefore, they were able to explain the process to the students in a clear way in order for all of them to have the same vision. On the other hand in Haninge, because the initiative came from the politicians, they first decided the time frame and then left the thinking about the planning and implementation to the project leader. This fact had a negative impact on her work. Furthermore, the project leader was hired part time:

> I found it also difficult to be an outsider because I work part-time; I'm not based on the council all the time and it is difficult to understand when I'm there only twice a week.

Additionally, the civil servants who would be involved in the project were not asked if they would be able to handle the additional workload within the time frame:

> … the politicians made this decision but they didn't ask the civil servants first if it is a good idea, so for the civil servant it is suddenly to have all this additional work. Also some things have being rushed because of the time frame.

Uddevalla case shows that when a PB project is part of a larger project about citizens' engagement then it is easiest to start planning and running it:

> …this is the difference between us and the other two municipalities because they joined the network because they were curious about what is this, but we had a project plan in the bottom, so they were match. And this was good because we could start immediately when/ by the time we joined the network.

In all the three cases an evaluation of project results was conducted and the results announced on Internet and in the press. This created transparency, satisfied the students and the citizens who had worked on the proposals and created the feeling that citizens' voices are listened to.

Regarding communication campaign, in Haninge the importance of a continuous communication campaign with different means and events is made visible. In Haninge they focused on how to make citizens submit proposals and not so much on making them discuss and vote. There was a gap in communication campaign from 7th of February the last day of proposals submission and 1st of April the launch of online discussion forum. In Uddevalla a good communication campaign was considered very important for the success of the project; so, they focused on using multiple channels for that purpose. However, trying to make students vote on the final proposals by sending e-mails was considered a wrong choice of communication tool since the students rarely used schools' email accounts. Another drawback was the lack of an online discussion forum and the failure to make the facebook group and the blog active:

> But there was a big group of students that they didn't even know about the opportunity they had to vote. Because they do not check regularly their e-mails…There were very few comments on the facebook group. In the blog there were some comments, not a lot.

As for local government's perception of democracy and political-administrative system slight differences were noticed among the cases as well. Haninge's politicians approach to democratic processes was of the kind "we decided you have to implement":

> It was the politicians who decided. The group is called 'demokratiföreningen', it is a strategy group or committee … they decided that they want to run a PB project… I got employed to do the job once they had decided to do it.

This is in contrast to Uddevalla where the decisive role was transferred to the students from the planning to implementation phase:

> they came/were included very early in the process, before we had any regular plans for the project. So they have been a part of it from the very beginning.

Also, the initiative of e-PB started from the local government while in the other two municipalities it was SKL's initiative (Bottom-up vs top down-approach). The PB process in Örebro showed that the local government took all the students' points of view into account and that politicians wanted to understand students and participate more with discussion in the processes:

> …we want and the politicians want to be involved in the process… Their role in the meeting is actually to listen to. Off course they give their point of view but most of all to listen and see how the citizens thinking.

In Örebro the rules of the whole process reveal a well-organized decision-making process. They ensured engagement and at the same time freedom to the students to decide on how they wanted to decide:

> From our side, the project, we said you are free to have a process as you want it. What we want is just one proposal from each school. How will you do that it is up to you.

However, in the final voting this freedom led students to actually vote for their school and not for the proposal. In Haninge, due to the fact that the project leader worked part time and sometimes at a distance, she did most of the work for the project by her own. However, her presence in the municipality's offices would ensure

regular co-operation with the other members of the project team and separation of duties. Also, the case study of Haninge showed that for the success of a project it is important that the project team has a clear understanding of what is going to happen and to share the same vision as well:

> But they really didn't have any clear idea, they said slightly different things.

The case of Uddevalla shows that when a PB project is part of a larger project about citizen engagement then the general objectives are already defined and can become even more specific. Therefore, Uddevalla was able to go one step further and be able to quantify PB project objectives:

> And we had a goal the number of the proposals will be some- thing about between 10 and 20 and we had 21.

Notably, the importance of quantifiable goals for an e-PB was not mentioned as a success factor in the literature that was reviewed.

Regarding to commitment, Uddevalla managed to engage the students during all the phases of the project: not only in planning, formation and submission of the proposals but also during the implementation phase. Furthermore, as it was pointed out by all the interviewees—but not mentioned in literature—was that in order to build citizens commitment politicians' presence during meetings is necessary. Moreover, they realized that more often face-to-face meetings increase citizens' commitment.

In Örebro the use of ICTs in the project was almost non-existent. Internet (e-mails) and telephone were used only to ask questions about the process and to submit proposals and not as a way to discuss or decide. However, the project leader is very positive to the idea of an online tool for discussions and voting for the next project. She mentioned, though, the importance of tools as supplements to face-to-face processes. In the case of Uddevalla the use of new technologies to include more people was regarded absolutely necessary. Project leaders believed that online discussion forums and e-Petitions increase citizens' participation. Their future vision is to include citizens and not only students in the process. They are already working at the neighborhood-level asking citizens to mention local problems. The thought is to create a list of what can be done, to allocate a budget and ask the people to prioritize the list. The challenge, however, is that in the current system the municipality cannot distinguish residents from different city neighborhoods. Therefore, project leaders believe that an e-identification system would contribute to the success of e-PB. In this way online participation will be enhanced by enabling the identification of the different target groups according to their areas.

Table 7.3 shows whether the case studies are in accordance with the propositions derived from literature study and therefore which of them meet the success criteria.

More importantly, besides the factors above the interviews revealed five other factors that affect the implementation of e-PB (Table 7.4). The first one is the amount of investment budget compared to the municipality's total investment budget. Allocation of small budgets minimizes the risk of failure. For example in Uddevalla, despite funding from EU, they preferred to keep the investment budget very small. Örebro followed the same strategy:

> You can criticize that this amount of money is nothing, it is very small…it has never done in Sweden before, we can't really go to another municipality and see how did you do it, so it is better to start in a small level to be safer, that was why we worked with it.

The second factor is the final proposals. Creative and innovative ideas tend to stimulate citizens interest and make them willing to vote and work for the implementation of the proposals. For example, in order to stimulate students to propose something innovative and attractive for the rest to vote on, Örebro municipality chose to offer very few examples of proposals:

> we didn't want to give them too many examples of this because we want be open-minded … we want them to have sort of creative, and freedom at the same time.

Moreover, including civil servants from different departments in the project group, proved to be a good work practice as it offered flexibility. Therefore, the final proposals were attractive and this resulted in higher turnout and engagement in the implementation phase.

The third new factor revealed by the cases was the target group spectrum. If it is small, it is easier to reach it and to involve the people behind it. In Örebro and Uddevalla they focused on small groups. The fact that they included students as target groups ensured high involvement in the process and high levels of engagement as students had to work on the proposals as part of their schoolwork. Haninge, on the other hand, had no previous experience of PB and aimed at every citizen. Hence, project leaders concluded that they should have focused on a smaller, more specific target group for easier reach.

The fourth factor is the thematic areas (subjects) where the investment is to be made. This factor affects the choice of the target group, the ways the project team will work and communicate with the group, and also helps citizens to have a focus and an orientation on what they propose. For instance, in Örebro where the subject was traffic and environment students focused on proposing specific ideas finally they decided to reconstruct an area close to the city river (responding to the subject "environment").

Finally, civil society's involvement is regarded crucial for e-PB because it leads to creative ideas for proposals and contributes to social web networking. Despite the fact that the result in Haninge municipality was not the desirable one, what they kept from the e-PB project experience is the civil society's involvement:

> I already had a plan and they gave me some ideas on how to make it better but I wasn't really able to change many things (time limit).

7.5 Conclusions

This study investigated what the success factors are for implementing e-PB projects. We investigated this by identifying factors in existing literature and by undertaking case studies in three Swedish municipalities running e-PB projects. From the

Table 7.3 Summary of case study findings

Group		Örebro	Haninge	Uddevalla
	Successful	Yes	No	Yes
G1: People related factors	P1 experience in decision-making	Low	Low	Low
	P2 experience in online discussions about local issues	Low	Low	Low
	P3 planning phase	Long	Short	Long
	P4 start of citizens involvement	In a good time	Late	Early
	P5 time for testing online tools	–	Not enough	Adequate
	P6 "window frame"	Small	Big	Small
	P7 evaluation	Yes	Yes	Yes
	P8 publishing the results	Yes	Yes	Yes
	P9 use of multiple channels	Yes	Yes	Yes
G2: Politics related factors	P10 bureaucracy, multiple levels of committees	Normal level	High	Normal level
	P11 clear objectives, goals, visions commonly shared	Yes	No	Yes
	P12 clear rules	Clearly defined	Unclear	Clearly defined
	P13 commitment	High	Low	High
G3: Technology related factors	P14 testing online software	–	No	Yes
	P15 e-voting, online forum	–	Yes	Yes
	P16 user-friendly and simple interface	–	Yes	Yes
	P17 software that ensures data protection	–	Yes	Yes
	P18 accessibility	Adequate	High	Adequate
	P19 integration	No	Yes	Yes

literature study we found 11 factors related to people, politics and technology and from our case studies we found 5 additional factors. Those relate to: size of budget, size and spectrum of participating groups, design of proposals, thematic area of the budget and civil society's involvement. In this way we have increased the understanding of what make e-PB projects work.

Regarding the "e" in e-PB we have come to three conclusions. Firstly, while it would be expected that Örebro would be lagging behind the other two municipalities in terms of success, as it is the municipality that represents the traditional implementation of PB projects, this study showed that traditional PB projects can be successful. Moreover, this study showed that when ICTs are used, they should be leveraged by the beginning of the project. This ensures better planning and enough time for testing the tools. This is one of the reasons, why despite both Haninge and Uddevalla municipality implemented e-PB projects, in Haninge the project was not successful. Furthermore, the great challenge regarding e- PB projects seems to be citizen engagement in decision-making processes. Therefore, ICTs without continuous communication campaigns, user-friendly interfaces, as well as the conduction of physical presence assemblies at the same time, cannot guarantee success of the project. Furthermore, when the target group is small it is easiest to be reached and convinced to use the ICTs throughout the process.

Table 7.4 Additional success factors noticed in the case studies

	Örebro	Haninge	Uddevalla
Amount of investment budget	✓		✓
Final proposals	✓		
Spectrum of the target group	✓		✓
Thematic areas (subject)	✓		
Civil society's involvement		✓	

We believe that this study is of interest for both research and practice. As for practice, since the list of factors can lead to the formulation of guidelines for successful implementation and for research, since the factors can be used for the creation of models and theories regarding e-PB project implementation.

We characterized our cases based on our data that among others included the objective opinions of our interviewees and maybe this is a limitation of our study. Moreover, an important issue that has been addressed by many researchers is how success can be measured. This study could be an interesting starting point for future research efforts trying to quantify or measure the success of similar projects based on the success factors we mention here. Check lists and evaluation forms could be created based on this study and thereafter they could be tested in practice, in a larger number of similar projects.

Furthermore, as communications in the public sector are changing, an interesting suggestion for future work could also include use of social media as a way of citizen input instead of or as complementary to a well-defined and structured process regarding e-PB implementation.

It might now seem that "e" in e-PB has a supplementary contribution to the success of participatory budgeting projects but we have to consider how technological evolutions will transform future societies and how substantial this "e" will finally become. This is a reason why we encourage researchers to focus on it in order to be prepared for the future.

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Chapter 8
Brazil Towards Government 2.0: Strategies for Adopting Open Government Data in National and Subnational Governments

Ricardo Matheus, Manuella Maia Ribeiro and José Carlos Vaz

Abstract Open Government Data (OGD) is a stream in which raw data is published for manipulation by others. This chapter presents the State of Art of OGD in Brazilian National, State and Municipal governments, describing benefits that OGD have been promoted on governments and society such as transparency promotion, social control and citizen participation. In addition, strategies used by governments are outlined aimed at boosting usage and the creation of chain value of OGD usage. Exploratory research is conducted by investing websites in accordance with the eight principles of OGD and the five stars of open linked data. Brazilian initiatives adopt almost all the principles of OGD and are in the third stage of a completely open linked data (three stars). Further, the strategy used by governments is the usage of citizen's participation on contests and hackathons improving usage of OGD available by governments and created several applications for social control, transparency and better provision of public policies (transport, health, education, etc.). This work also adds an element inexistent on the literature known: strategies of dissemination and incentive of open data usage. The results indicate the existence of virtuous cycle of information when using public policy of open data is aligned with the implementation of the collection, analysis and opening data for several branches of city hall, and even that little data, but organized, can offer the possibil-

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ity of citizen conduct social control, suggest improvements of the public service through studies and applications connected to processes performed by the city and local economic development.

8.1 Introduction and Contextualization

The Federative Republic of Brazil is the biggest country of South America, with around 190 million of habitants spread in 8,514,876 km^2 (IBGE 2010). Brazil is also the first economy of Latin America and the seventh of the world (IMF 2011). The capital is Brasilia, situated at the very center of the country, but the biggest city is São Paulo, at the Southeast, with 11.8 million inhabitants (IBGE 2010). The country is divided in 26 States and 5565 cities (IBGE 2010), which are federative units—which mean they are autonomous and have their own Legislative and Executive branches. The cities became autonomous after the Constitution of 1988, which marked the end of military dictatorship in the country, after 21 years.

On the Brazilian aspects of Information and Communications of Technologies (ICT) usage for transparency by government, it is possible to describe two developments stages: The first crescent usage of ICTs and the second the legal framework.

The first stage, the crescent usage of ICTs, is described as the Internet usage since its opening to civil society, in 1995, to current days. The access of personal computers reached 51% of households and over than 264 million of mobile phones active lines (ANATEL 2013), which helped to lower the cost of information dissemination and shorten distances between people in a country of continental size as Brazil (Diniz et al. 2009). From this it became possible to make available a huge amount of data from governmental services provided to citizens, enterprises and to government agencies.

The second characteristics is the legal framework such as the creation of laws created that are related to transparency, specifically focused on information about Public Administration. During the 2000s a series of laws were created affecting the production of administrative actions of the State to promote the transparency of income and expenses (Mello and Slomski 2010), including in the creation of the national policy of open data. The Complementary Law 131, also known as Capiberibe Law or Transparency Law, came into effect and was aimed at as a means of dissemination of public information on the Internet. Since May 2010, municipalities with more than 100,000 habitants are forced to create portals to publish real time, detailed information on the budgetary and financial execution. Already before the creation of this legislation, several government initiatives popularly called as "portals of transparency" emerged (Matheus et al. 2010).

In 2011, the Access to Information Law (LAI)[1] came into effect. This law regulates to access to public information in all Brazilian government agencies. This legislation sets out the procedures for requests information from the general public

[1] http://www.planalto.gov.br/ccivil_03/_ato2011-2014/2011/lei/l12527.htm.

and personal. Request for the public should be freely disseminated, whereas personal data such as name or elements that can identify people, which will be released for a while more than 100 years from the date of its production and sensitive, with maturities of 5, 15 and 25 years for documents considered reserved, secretive and ultra-secrets respectively (Ventura 2013). This legislation also has introduced the open data in the Brazilian government. The LAI presents that all data available to the public, either actively—provided automatically by the government, or passive—via requests for access to information, they should be formatted according to some rules of open data.

Brazil has become one of the first countries to join the International Open Government Partnership (OGP), with governments' pioneers in implementing policies of open government data as the United States of America (USA) and United Kingdom beyond the founders Indonesia, Mexico, Norway, the Philippines and South Africa. The pioneering example is United States of America, and its federal government created a level of openness of government information by creating a memo on transparency and open government requiring that all actions of the ministries themselves should be based on transparency, citizen participation and collaboration between government and society (Obama 2009). In addition, the Ministry of Science and Technology created the Open Government Initiative to effect the availability of open government data (Fung and Weil 2010). In practice, Open Government Partnership and Open Government Initiatives do not have to result into OGD. However, the more open is a government, the more is the probability of more initiatives appear on National and Subnational governments and the more data is opened (Matheus et al. 2012).

Supported by the development of ICTs, OGD can go further publication of reports or queries to access the databases. It became possible to offer database in its raw state, to be freely manipulated, filtered or mixed with others, including allowing the construction of new knowledge and applications by civil society. Some of consequences of this new possibility of governmental transparency are social control and citizen participation through collaboration (Nam 2011; Parks 1957; Parycek and Sachs 2010; Robinson et al. 2009; Sherida and Tennison 2010; Yildiz 2007; Dawes and Helbig 2010).

This article explores the state of the art of OGD in Brazil. The methodology used was

- Literature eview of OGD
- An exploratory search of initiatives of OGD in Brazil on national and subnational levels.
- Structured visit of selected websites from the exploratory search of Brazilian OGD initiatives, in format of check-list from the theory.
- Further that, it was observed theirs strategies to boost usage and creation of chain value of OGD, such as the creation of Contests, Challenges and Hackathons.
- Also the usage of OGD to creation of applications web-based and on cellphones were observed.

This chapter is structured as follows. First, the paper presents a concept discussion about the concept of OGD on the Theoretical Background, which the analysis of websites and impacts is based. An exploratory search based on the main institutional websites is presented. The portals that fit the OGD concept were selected to be analyzed in the context of Theoretical Background.

The findings show initiatives on federal, state and local level, which were evaluated through structured inspection of each one of OGD portals found based on the eight principles of OGD and the five stars of open linked data. This evaluation shows that Brazilian initiatives adopt almost all principles of OGD and are on the third stage of a completely open linked data (three stars). Further, the strategy used by governments is the usage of citizen's participation on contests and hackathons improving usage of OGD available by governments and created several applications for social control, transparency and better provision of public policies (transport, health, education, etc).

8.2 Literature Review

Open Government Data (OGD) is a term used to denote governmental information available via the Internet in the public domain for free use by society. This concept refers to the unrestricted access to government information, excluding personal information and security sensitive data from governments (Davies 2010). For example, information about where are the police stations are freely distributed in Brazil, however, the position of policemen will not be show and probably never will be know the amount of guns and ammo with every policemen. Those cases will appear on almost every area of government: Health, Education, Transport, etc (Matheus et al. 2012; Torkington 2010).

The benefits of adopting the OGD in the field of transparency and social control are, at least in theory, evident. The provision of OGD tends to contribute to the increased transparency of government, creating better opportunities for social control of government actions. However, given the relative newness of the topic, yet there have been no studies that show the whole of this possibility (Conradie and Choenni 2012; Janssen et al. 2012). A second category of benefits can also be addressed by literature. It is the possibility of creating new information and applications from the OGD. In this case, transparency is not only encouraged, but also new services may originate from the interaction between government and society through the exploitation of OGD (Helbig et al. 2012). These services can be generated through new ways of working collaboratively across the participatory government and private institution, going further the concept of OGD that views citizen as a mere recipient of public information (Lathrop and Ruma 2010; Zuiderwijk et al. 2013).

The World Wide Web Consortium (W3C), international consortium created to develop Web standards, defines OGD as publication and dissemination of public sector information on the web, shared in raw format and open, understandable of course, to allow its reuse in digital applications developed by society (Diniz 2010).

In addition, the W3C considers that governments should encourage citizens to use the open data available by governments, ie, they should be encouraged to reuse the data according to their needs and wants. Protection of open data as a promoter of transparency is due to the possibilities of making government records accessible to eliminating all restrictions concerning technology, accessibility and legislation to International Initiatives of Open Government Data Portals (Matheus et al. 2012).

Around the world, is possible to verify this dissemination. The pioneer countries are Australia, New Zealand, United Kingdom and United States. With National policies on access to public data on web portals, they have been encouraging citizens to create new applications and ways of using information published in their portals. Until the finish of this chapter, there were 59 countries on the OGP list that already did actions plans for open government and endorsed the open government declaration (OGP 2011).

Further from the theory, it is important to highlight some discussions and theories that have been applied on the open data public policies. Firstly, O'Reilly's with others specialists joined by 30 supporters of open government to discuss OGD and its importance to democracy (O'Reilly and Malamud 2007). At this meeting of experts and advocates of OGD, it was developed the eight principles OGD. These principles state that the OGD should be:

1. **Complete**: All public data is made available. Public data is data that is not subject to valid privacy, security or privilege limitations.
2. **Primary**: Data is as collected at the source, with the highest possible level of granularity, not in aggregate or modified forms.
3. **Timely**: Data is made available as quickly as necessary to preserve the value of the data.
4. **Accessible**: Data is available to the widest range of users for the widest range of purposes.
5. **Machine understandable**: Data is reasonably structured to allow automated processing.
6. **Non-discriminatory**: Data is available to anyone, with no requirement of registration.
7. **Non-proprietary**: Data is available in a format over which no entity has exclusive control.
8. **License-free**: Data is not subject to any copyright, patent, trademark or trade secret regulation. Reasonable privacy, security and privilege restrictions may be allowed.

Inside this perspective of how theory can influence practice, Eaves (2009) created three laws of open government data, based on his work at Vancouver City, in Candá. This works is quite similar of what O'Reilly did in 2007 and advance on the thematic:

1. If it can't be spidered or indexed, it doesn't exist;
2. If it isn't available in open and machine readable format, it can't engage; and,
3. If a legal framework doesn't allow it to be repurposed, it doesn't empower.

Deepening methods to measure the level of OGD in governmental Portals, Berners-Lee (2012) created five stars of open linked data. Actually, this method was created to explicit categories of open data publication on the Web in levels of increasing usefulness, that encapsulate the present shared vision of the Semantic Web as a Web of Linked Open Data, and that individuals can use to rate their own data publication. It was divided in five categories (Shotton 2012)

- **One star**: available on the web (whatever format) but with an open license, to be open data.
- **Two stars**: available as machine- readable structured data (e.g. excel instead of image scan of a table).
- **Three stars**: as (2) plus nonproprietary format (e. g. CSV instead of Excel).
- **Four stars**: all the above plus, use of open standards from W3C (RDF or SPARQL) to identify things, so that people can point at your stuff.
- **Five stars**: all the above, plus: link your data to other people's data to provide context.

8.3 Research Approach

The objective of this chapter is to present the State of Art of the OGD in Brazilian National and Subnational governments and how are they publishing data in accordance with the international rules of open data (eight principles and five stars classification). To achieve this goal, firstly, a literature review was conducted that guided this study focused on the key concept: Open Government Data (OGD) and an exploratory search to identify the initiatives already undertaken by governments in Brazil. This exploratory search was conducted through engine searchers (Bing, Google and Yahoo), from the literature review, international prizes of public administration, mainly about OGD and also using the method of snow ball, asking for expert people on specialized websites and lists during the months of April and May of 2012 and also during the months of March and April of 2013.

Thereafter, an analysis was carried out to verify the compliance with eight principles of OGD (O'Reilly and Malamud 2007) and the five stars (Berners-Lee 2012), in accordance with the two kind of measures found on the literature review and presented on below: Eight Principles and Five Stars of Open Linked Data. These series of structured inspections on these websites was done between 02/04/2013 and 18/04/2013.

For the eight principles, it was conducted a structured inspection on the OGD Portals collecting information on each principle, building a table where we had three options: yes, no, or info not provided. For yes, of course, the principle was identified at least one time on the structured search. For no, the principle was not identified anywhere. Info not provided happened when information about the principle was not provided by the portal.

In the case of the five stars of Open Linked Data (Berners-Lee 2012), a structured inspection on the OGD Portals was conducted by collecting information about the data available, and categorizing this data how open is it toward the maximum level, when every data is automatically in an open format and connected.

Finally, doing a small contribution to the theory around Open Government Data, a description of strategies used by governments' initiatives to boost usage was made and the creation of chain value of OGD usage as applications web-based and on cellphones, such as contests, hackathons, were analyzed. This update was based on the work of Zuiderwijk and Janssen (2013). Below on the Table 8.1, the list of websites accessed for the website survey.

8.4 Results of Exploratory Search of Initiatives, OGD Principles Adhesion and Strategies to Boost Usage and Creation of Chain Value of OGD

OGD Portals Found in Brazilian Federal Level Government and OGD Principles Adhesion

The exploratory search to find open government data portals found three initiatives that call themselves as open data portals. There are other initiatives transparency portals, fruit of the Brazilian law as pointed out in Chap. 1 introduction and contextualization, however, they were not used as references and initiatives as not suitable for storage of datasets open data, so only static pages and spreadsheets of financial results of the Federal Government.

The Federal Executive Branch portal also was a bottom-up approach evidence on the initiative, where several civil society organizations and civil servants have been reunited to create policies and the Open Data National Infrastructure (ODNI) (Miranda and Silva 2010). For example, Open Knowledge Foundation Brazil (OKFn-Br), W3C Brazilian Office, Transparência Hacker Group (THacker) and others volunteers from civil society helped constructing datasets, guidelines and promoting discussions and prizes around Open Data in Brazil through the Federal Executive Branch Open Data Portal.

In relation to the principles of open data, it was identified that all of open data portals have challenges to improve data complete and primary. In the case of the portal of the Senate, another challenge for improvement was identified. It asks for the registration of users, which characterizes not meet the principle of non-discrimination.

Furthermore, we identified a small number of initiatives, considering the direct and indirect public administration of the Federal Government, with more than 30 ministries and various public entities within the Judiciary Power. Nevertheless, it is possible to understand that different database that could be on specific OGD Ministerial portals, are inserted into the portal of the Executive Branch, and what a positive factor for citizens that can find to use and re-use makes in one only portal (Table 8.2).

Table 8.1 List of websites accessed. (Source: Made by the Authors (2014))

Website name	Website address
Federal Executive Branch	http://www.dados.gov.br
Federal Senate	http://www24.senado.gov.br/
Federal Chamber of Deputies	http://www2.camara.leg.br/transparencia/dados-abertos
Executive Branch of São Paulo State	http://www.governoaberto.sp.gov.br/view/
Executive Branch of Pernambuco State	http://www.dadosabertos.pe.gov.br/
Court of Accounts of Rio Grande do Sul State	http://dados.tce.rs.gov.br/
Court of Accounts of Ceará State	http://api.tcm.ce.gov.br/
Court of Accounts of Paraíba State	http://portal.tce.pb.gov.br/dados-abertos-do-sagres-tcepb/
Legislative Assembly of Minas Gerais State	http://www.almg.gov.br/sobre/dados_abertos/
Legislative Assembly of São Paulo State	http://www.al.sp.gov.br/transparencia/dados-abertos
Legislative Assembly of Rio Grande do Sul State	http://www2.al.rs.gov.br/transparenciaalrs/DadosAbertos/tabid/5584/Default.aspx
City Council of São Paulo Municipality	http://www.camara.sp.gov.br/index.php?option=com_wrapper&view=wrapper&Itemid=219
City Hall of the Municipality of Rio de Janeiro	http://riodatamine.com.br/#/homepage
City Hall of the Palmeira Municipality	http://www.palmeira.pr.gov.br/home/AtosOficiais/125/1/
City Hall of Novo Hamburgo Municipality	https://dados.novohamburgo.rs.gov.br/
National Institute of Educational Studies (INEP—Ministry of Education)	http://portal.inep.gov.br/visualizar/-/asset_publisher/6AhJ/content/8-equipes-sao-escolhidas-para-hackathon
Ministry of Justice	http://portal.mj.gov.br/transparencia/data/Pages/MJ2774919DITEMID-5DAF2FE3A3124A1485758E9369D-F12A9PTBRNN.htm
Prize Mário Covas—Category Open Data by Citizens	http://www.premiomariocovas.sp.gov.br/2012/index.html
Rio Grande do Sul State	http://gabinetedigital.rs.gov.br/post/2721/
Rio de Janeiro City Hall	http://ideias.rioapps.com.br/landing
São Paulo City Hall	http://www.camara.sp.gov.br/index.php?option=com_content&view=article&id=9488&Itemid=219
W3C—Brazilian Office	http://t.co/ZYHahnLnKY

OGD Portals Found in Brazilian State Level Government and OGD Principles Adhesion

At the state level, it was possible to identify eight initiatives found on the exploratory search. There is important to highlight that Legislative, in Brazil, have an auxiliary system to verify the financial execution of Executive Branch. They are called Court of Accounts, and some of those initiatives found are based on data from Executive Branch analysis. Further that, Executive Branch and Legislative Power had initiatives of OGD portals.

Table 8.2 OGD portals found in Brazilian federal level government and OGD principles adhesion

Name of portal	Principles							
	Complete	Primary	Timely	Accessible	Machine understandable	Non-discriminatory	Non-proprietary	License-free
Federal Executive Branch	NO	NO	YES	YES	YES	YES	YES	YES
Federal Senate	NO	NO	YES	YES	YES	NO	YES	YES
Federal Chamber of Deputies	NO	NO	YES	YES	YES	YES	YES	YES

In relation to the principles of open data, it was identified that all of open data portals have challenges to improve data complete and primary. In the case of the portal of São Paulo and Pernambuco Executive Branch States, another challenge for improvement was identified. They ask for the registration of users, which characterizes not meet the principle of non-discrimination. Further, Court of Accounts of Ceará State, Legislative Assembly of Minas Gerais and Rio Grande do Sul States, don't have any citation of data being Licensed Free, not meeting one of the principles.

Furthermore, we identified a small number of initiatives, considering the direct and indirect public administration of the State Level Government, with a big quantity of secretariats (health, education, Social Aid, etc.) and various public entities within the Judiciary Power. Nevertheless, it is possible to understand that different database that could be in secretariats on specific OGD portals, are inserted into the portal of the Executive Branch, and what a positive factor for citizens that can find to use and re-use makes in one only portal (Table 8.3).

OGD Portals Found in Local Level Government and OGD Principles Adhesion

At the local level, it was possible to identify four initiatives found on the exploratory search. It is important to highlight that there is only one Executive Branch and Legislative Power. There is no Judiciary agencies at local level. São Paulo and Rio de Janeiro are the two most bigger and developed in Brazil, and theirs OGD portals have a small quantity of datasets. Furthermore, it was discovered two small cities on the Southern of Brazil. Palmeira Municipality, on Paraná State, and Novo Hamburgo Municipality, on Rio Grande do Sul State, also have OGD portals.

Table 8.3 OGD portals found in Brazilian state level government and OGD principles adhesion

Name of portal	Principles							
	Complete	Primary	Timely	Accessible	Machine understandable	Non-discriminatory	Non-proprietary	License-free
Executive Branch of São Paulo State	NO	NO	YES	YES	YES	NO	YES	YES
Executive Branch of Pernambuco State	NO	NO	YES	YES	YES	NO	YES	YES
Court of Accounts of Rio Grande do Sul State	NO	NO	YES	YES	YES	YES	YES	YES
Court of Accounts of Ceará State	NO	NO	YES	YES	YES	YES	YES	Info not provided
Court of Accounts of Paraíba State	NO	NO	YES	YES	YES	YES	YES	YES
Legislative Assembly of Minas Gerais State	NO	NO	YES	YES	YES	YES	YES	Info not provided
Legislative Assembly of São Paulo State	NO	NO	YES	YES	YES	YES	YES	YES
Legislative Assembly of Rio Grande do Sul State	NO	NO	YES	YES	YES	YES	YES	Info not provided

Table 8.4 OGD portals found in local level government and OGD principles adhesion

Name of portal	Principles							
	Complete	Primary	Timely	Accessible	Machine understandable	Non-discriminatory	Non-proprietary	License-free
City Council of São Paulo Municipality	NO	NO	YES	YES	YES	YES	YES	YES
City Hall of the Municipality of Rio de Janeiro	NO	NO	YES	YES	YES	NO	YES	YES
City Hall of the Palmeira Municipality	NO	NO	YES	YES	YES	YES	YES	YES
City Hall of Novo Hamburgo Municipality	NO	NO	YES	YES	YES	YES	YES	YES

In relation to the principles of open data, it was identified that all of open data portals have challenges in accordance with the literature review (O'Reilly 2007; Berners-Lee 2012; Zuiderwijk and Janssen 2014) to improve data complete and primary as well State and Federal levels.

In the case of the OGD portal of Rio de Janeiro City Hall, another challenge for improvement was identified. Rio OGD portals asks for the registration of users, which characterizes not meet the principle of non-discrimination. Comparing all the local level in Brazil (5565 municipalities), four is a really low number of cities found, being a challenge of improvement for local level transparency in Brazil (Table 8.4).

Table 8.5 Five stars of open linked data adhesion

Sphere	Name of portal	Star stage
Federal	Federal Executive Branch	Level 3
	Federal Senate	Level 3
	Federal Chamber of Deputies	Level 3
State	Executive Branch of São Paulo State	Level 3
	Executive Branch of Pernambuco State	Level 3
	Court of Accounts of Rio Grande do Sul State	Level 3
	Court of Accounts of Ceará State	Level 3
	Court of Accounts of Paraíba State	Level 3
	Legislative Assembly of Minas Gerais State	Level 3
	Legislative Assembly of São Paulo State	Level 4
	Legislative Assembly of Rio Grande do Sul State	Level 3
Local	City Council of São Paulo Municipality	Level 3
	City Hall of the Municipality of Rio de Janeiro	Level 3
	City Hall of Palmeira Municipality	Level 2
	City Hall of Novo Hamburgo Municipality	Level 3

Five Stars of Open Linked Data Adhesion

In the case of Tim Berners-Lee method, the Brazilian cases are in the following phase:

- One Star: the first stage requires that the website contains data available independently of the format, but with an open license. All the cases studies presented data available and an open license.
- Two Stars: All portals presented data available as machine-readable structured data, but only the City Hall of Palmeira, a small municipality on the countryside of Paraná State (Southern of Brazil);
- Three Stars: The Portals use mainly non-proprietary archives such as XML, CSV and HTML, so, they achieved the third stage, and;
- Four Stars: Only one portal, Legislative Assembly of São Paulo State has the RDF file type, that enable people to identify things and point at your own applications (Table 8.5).

Unfortunately, it was not found the five star level of open linked data. To achieve this level, the governmental portals have to link their data to other data to provide context.

Strategies used by Brazilian Governments to Boost Usage of OGD

The exploratory search to find strategies to boost usage of OGD by civil society found six initiatives from government and one initiative from the civil society organization W3C Brazilian Office. The strategies are divided in two types: hackathons and contests.

Table 8.6 Strategies used by Brazilian governments to boost usage of OGD

Sphere	Name of institution holding strategy	Strategy
Federal	Education (INEP)	Hackathon
	Minister of Justice	Contest
State	Prêmio Mário Covas—Category Open Data by Citizens	Contest
	Rio Grande do Sul State	Contest
Local	Rio de Janeiro City Hall	Contest
	São Paulo City Hall	Hackathon
Other institutions	W3C—Brazilian Office	Contest

The hackathons, or also called as Hack Day, are events in which computer programmers and others involved in software development collaborate intensively on software projects. In Brazil, generally they are fast, mainly about one weekend focused on the development of the application, called as API. It is important to highlight that are prizes in money or any other values for the best APIs. In some cases, the prizes are the financial assistance for the developers develop, test and run the APIs.

The other type of strategy found was the use of contests. The initiatives of contests have the focus on the development of APIs for the institution where the data was published or even a category of prize inside another big prize of Public Administration Innovation—the case of Prêmio Mário Covas (Prize Mário Covas). As well the hackathons, there are prizes in money or others values offered by governments (Table 8.6).

8.5 Discussion

The emergence of the OGD requires a shift in thinking about the transparency of governmental actions and information. The very practice of social actors involved is creating new demands for transparency, not served by traditional practices in electronic government towards the massive usage of internet and ICTs but without the conception of governance, social control and participation of citizens on the public management. In other words, too much technology and a few transparency (Pinho 2008; Frick 2005).

There is a major change in the principles that guide the handling of demands for transparency. So far, everything that was not confidential should be made available to the public upon request, or kept available as possible. The new framework from Open Government Data (O'Reilly and Malamud 2007; Berners-Lee 2012) gives rise to a new level of demand for transparency: everything that is not confidential should be available on the Internet as open data in a way people cannot just access data, but also create new services and analysis with these open data.

Obviously, implementing broader OGD programs will face huge barriers, because most governments would not be mobilized to increase the level of social control over them. However, the complexity of the issue makes it impossible to

reduce it only to the interest of governments in promoting transparency through the OGD. Civil society has an important role, too. In addition, comprehensive programs to spread open government data require using data formats and technologies are not always employed by governments themselves. Therefore it will be a difficult task even for well-intentioned governments and surely will took many years to reach a high level of open government data availability.

The scenario shows that technology already exists for governments and civil society to use government data as they decide. Available technology can support new ways and new indicators of thinking about public administration. In this way, civil society could generate more innovation from unrestricted access to public data. The development of open government data depends on a clear policy of the Administration in regard to access to public information, changes in public sector strategies aiming to foster transformation of relations between state and society. "Moreover, it depends on a change in the central locus of public organizations as interpreters of social needs" and also as service delivery agents (Matheus et al. 2012).

Further governmental portals of open data and its strategies to citizen usage, W3C Brazil (W3C 2013) argues that to achieve the goal of providing open government records should be observed three fronts: Map of Youth and Adults School (EJA), a map showing the openings of adult education in public schools in Brazil; Tr3e: website that crosses over the information of deforestation in Brazil, and; Open Parliament: website designed to facilitate access to information about MPs in Brazil. These civil society initiatives demonstrate how the issue is increasingly taking up space on the agenda of organizations and groups interested in using IT to promote democratic developments in Brazil. Taken together with the emergence of new government initiatives, these initiatives show a clear sign of an expanding supply of OGD in the coming years.

Despite the existence of few theoretical and empirical data on open government in Brazil, there is a clear expansion of national initiatives and discussions. The Open Data National Infrastructure (ODNI) has great potential to accelerate the adoption of open government data initiatives in the country (Miranda and Silva 2010). The ODNI has great potential to accelerate the adoption of open government data initiatives in the country and can also influence beyond the limits of the Federal Government and stimulate initiatives at the subnational level, offering standards and guidelines, made with citizen participation, which can be adopted by States and Municipalities to improve theirs levels of OGD. Besides the few public open data portals that adopt the open government data, the LAI also helps to promote open data, regulating access to government information as provided on Brazilian Federal Constitution.

Among the required data are public expenditures and the general data for the monitoring of programs, activities, projects and public works. There is an obligation of public agencies not only to disclose such information, but also make them available so that they are easily accessed, understood and updated. Open government means that public data should be disclosed in the most disaggregated level possible and in different formats. Disclosure must attain the raw data which should be able to be viewed on any type of machine for anyone who want to make use of such data.

Thus, the law has principles of open government (even if not explicitly quote) for the dissemination of public information.

From the perspective of the quality of data and its publication, the results of exploratory search of initiatives in Brazil and the OGD principles adhesion reveals that Brazil has not yet fully developed your OGD portals. For example, the majority of websites do not have complete and primary data, which are considered important for open data principles. Further, some of websites do not have any mention about the license, if it is free or not. This missing could take citizens not use, or use thinking they are doing illegal usage of data. For suggestions of development, governments could simply put all the data online and put online that all the data can be downloaded and worked, showing the rules for usage, or, using the sign of open data, what automatically means that the website really support this principles.

On the other hand, we have the open linked data and the majority of the initiatives with three stars (level 3), what means that they have data in open format. Further that, we have a small municipality, Palmeira, on Paraná State, with two stars (level 2), with data on closed format (spreadsheet of Excel). The highlight of this dimension of analysis goes to the Legislative Assembly of São Paulo State, which provides access to Resource Description Framework (RDF format of file). With this file freely on internet, citizens can do general method for conceptual description and save time on coding or using the data for other purpose.

However, governments are not only publishing data and adhering open data principles. They also have been trying to promote ways to boost usage and creation of chain value of OGD. On the initiatives, or related to them, we found two main strategies to disseminate and boost usage of the OGD published by them: hackathons and contests. The two ways are similar, but not identical. They have differences mainly about how long they are open to receive and develop applications, for example. While hackathons take no longer than one weekend, contests have more than 1 month of preparation or working.

Further these strategies and theirs methodologies, it can be realized that the more time and more money are on the contest, specially, the more specialized the team are and the results are well constructed. For example, the website of the City Council of São Paulo Municipality was “hacked” in open format during a hackathon lasting a weekend. It is simple and helped a lot, however, if we can compare the results of the contests on Rio de Janeiro Municipality called “Rio Ideas”, they are more developed and have support from universities, media, local governments and others groups and citizens focused on OGD.

From this point is important to highlight also some groups that are on the majority of the initiatives working or even participating as “hackers”. The THacker group have been working together the National level, regional level of São Paulo State and local region level of São Paulo State. They already helped to construct guidelines for publishing OGD, publishing OGD and training people on the government, organizing prizes and judging them. Another institution important to some of those initiatives and for the emerging topic of OGD is the Brazilian Office of W3C. They have been financing several initiatives related to OGD since 2009. For example, the guideline created by THacker, a group with list discussion and face meetings with

people from all the Brazilian regions, with the most different interests and from different spheres (government, enterprises and civil society organized). Further that, they also have been judging and sponsoring local and national conquests, including one on the area of Journalism (Matheus et al. 2013).

From this Brazilian puzzle, future additional studies would be useful for better understanding the demands/needs for OGD and evaluate impacts of present and new initiatives of OGD to promote transparency, social control and citizen participation. In future studies, it would be also important to check what are the challenges of Brazilian governments to achievethe five stars, adopt the eight principles and boost usage of all the data published by OGD portals. Further, from the perspective of citizens, it is also important to keep monitoring what the usage of OGD have been doing, at least checking contests and hackathons, specially verifying what new is happening in terms of social control, transparency and applications for better delivery of public services.

8.6 Conclusion

The results reveal that there is a usefulness of evaluating the websites based on the eight Principles and the Five Stars Framework of implementation. For example, it is possible, for civil society control governments using this metric and for the municipality showing that the work has been doing based on international standards. This pattern can also improve the possibility of creating linked data through international network. If, at least every country creates a portal with data from Education, studies will be easily done because of the patterns around open data.

It is important to highlight that the overview of strategies in Brazilian National and Subnational governments can inspire other initiatives in brazil, such as the pioneer National Open Data Portal inspired the others, and also the creation of spaces of network for political, as the Open Data Network and for technical, at Open Data National Infrastructure (ODNI) (Miranda and Silva 2010).

Lastly, this work also adds an element inexistent on the literature known: strategies of dissemination and incentive of open data usage (Zuiderwijk and Janssen 2013). The results indicate the existence of virtuous cycle of information when using public policy of open data is aligned with the implementation of the collection, analysis and opening data for several branches of city hall, and even that little data, but organized, can offer the possibility of citizen conduct social control, suggest improvements of the public service through studies and applications connected to processes performed by the city and local economic development.

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Chapter 9
Twitter and 2013 Pakistan General Election: The Case of David 2.0 Against Goliaths

Saifuddin Ahmed and Marko Skoric

Abstract This study followed the online activity on Twitter during Pakistan's landmark 2013 General Election, also hailed as Pakistan's first Twitter election, which marked the first ever transfer of power between two elected civilian governments. This election saw the unexpected emergence of Pakistan Tehreek-i-Insaf (PTI), the political underdog which followed close at the heels of well-established dynastic parties to grab the third-largest number of seats in the National Assembly. The rise of this party and its leader is attributed to the estimated 30 million young Pakistanis who voted for the first time and the advent of social media, as well as the leadership of Imran Khan, the most famous sports celebrity in the country. This study focused on the Twitter campaigns of Pakistan's political parties with the aim to investigate how the medium was used by political parties for information dissemination, interaction, mobilization and engagement of voters. Our investigation was related and discussed in the context of the actual success achieved by each party. The approach followed was systematic automatic and manual content analyses and a social network analysis of the tweets (n = 10,140) posted by the top four political parties and their leaders in the month leading up to Pakistan's general election. Our findings identify that every party used Twitter for different purposes. PTI used Twitter in the most diverse ways—they interacted with voters, provided real time detailed campaign updates, discussed specific social and political issues and called for a greater mobilization of citizens to vote. Through triangulation of our findings with the publically available election data provided by the Election Commission of Pakistan we further conclude that the success story of PTI, especially at the provincial level, was a blend of the party riding on personality politics paradigm with a combination of an increase in voter turnout and strategized online-offline campaigning targeted at the youth.

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9.1 Introduction

Twitter, the social networking tool, has emerged to be a powerful medium to connect, influence and engage its audience. Political landscapes throughout the world have been affected or altered by the political force which is Twitter; the uprisings in MENA region are an example. There is a radical transformation in the ways citizens and governments connect with each other. The design of the Twitter platform allows citizens to interact with each other, exchange messages enmasse and participate in a global debating arena. On the other hand, the medium also provides governments and politicians with an opportunity to connect with the citizens in new and effective ways and in the process eliminates the heavily mediated communication offered by the traditional media (Harfoush 2009; Posetti 2011). Appreciating this fact, politicians across the world have openly embraced Twitter; academic research too has established how Twitter has been extensively used by political candidates in United States of America (Christensen 2013; Conway et al. 2013; Hong and Nadler 2011), United Kingdom (Graham et al. 2013), Finland (Strandberg 2013), Sweden (Grusell and Nord 2011), Australia (Bruns and Highfield 2013) and New Zealand (O'Neill 2010) to connect and reach a wide audience base.

However, much of the exploits of Twitter as a political engagement tool have been in technologically advance democratic societies with high Internet accessibility and a large numbers of new media users. The usage of the medium for politician-citizen exchanges in a country like Pakistan, with low Internet penetration rates and the looming threat of terrorist attacks, has never been explored before. Because of the dangers to lives in face-to-face campaigning, Twitter plays a special role—as a convenient refuge and a more secure platform to connect with citizens. It is here we present a study first of its kind—investigating the usage of Twitter as a political engagement and campaign tool for Pakistan political parties and their leaders during the 2013 General Election.

Pakistan is an interesting case study for several reasons. Since its creation in 1947, Pakistan, the fifth largest democracy in the world, has seen three periods of martial law, extra-constitutional removal of civilian governments and disturbed civil-military and continuous political instability. Three attempts at an effective democratic transition of power in the past produced an assassination, a military coup and an imposition of martial law. However, the 2013 General Election witnessed the first ever democratic transfer of power in the country's political history. The elections were marred by violence but that did not stop the citizens from voting in large numbers and recording one of the highest voter turnout rates in Pakistan's election history.

These elections also witnessed the emergence of social media, including Twitter, as a tool of election campaign and electoral mobilization (Masood 2013). For the first time in Pakistan's politics, social media played an active role, partly because violent attacks on political rallies in the past forced political parties to place a greater emphasis on the internet campaigning during this election.

Pakistan's political affairs in the past have been dominated by old style dynastic politics and though the 2013 General Election result signaled a victory of sorts of the same it also saw a change. The social media campaigning combined with a vastly improved voter turnout has much to do with the emergence of a (non-dynastic) third national party, Pakistan Tehreek-i-Insaf (PTI). PTI, a political party under the leadership of Imran Khan, a former cricket star whose appeal as an anticorruption crusader combined the party's extensive social media campaigns helped them come out of political backwaters and establish themselves as a major force in the political reckoning of Pakistan.

Thus by exploring the usage of Twitter by Pakistani political parties during the 2013 General Election with a special emphasis on PTI, a rising political power, we will investigate the strength of Twitter as a campaign tool. We will also present an analysis of PTI's Twitter approach and relate it to their success in the General Election with an aim to foster greater understanding of how social media campaigning in emerging democracies can contribute to success in the ballot box.

9.2 Background

Political Use of Twitter

With a projected social network of 500 million users in 2013, Twitter is growing as a conversational medium connecting ordinary people to celebrities, the commons to influential and citizens to governments. In recent years a number of studies have examined the use of Twitter in politics; Bruns and Burgess (2011) identified the key patterns and themes in public conversations related to elections. Kim (2011) found that Twitter was being used by citizens primarily for political information-seeking, entertainment and social utility. Larsson and Moe (2012) identified different user types based on how high-end users utilized Twitter during the 2010 Swedish election. A number of scholars have also used the networks generated within Twitter during electoral campaigning as a validated tool to predict election results (Bermingham and Smeaton 2011; Skoric et al. 2012; Sang and Bos 2012; Tumasjan et al. 2010). All these studies suggest the widespread Twitter involvement of citizens during elections.

Twitter has been widely used in recent years to support electoral campaigning (Hendricks and Kaid 2010). Scholars specifically have analyzed the use of Twitter by politicians and party organizations during election campaigns. Grusell and Nord (2011) highlight the need of Twitter examination in relation to election campaigns due to the newness of the medium. Strandberg (2013) raises the purpose of Twitter as a political mobilization tool and in doing so agrees with Norris (2001) who emphasizes the use of online tool for the purpose of engaging the citizens. A majority of such studies deal with Twitter usage in the US political environment. Metzgar and Maruggi (2009) established the facilitating role of Twitter in unfolding of the

2008 US elections. Livne et al. (2011) found significant differences in Democrats, Republicans and Tea Party candidates' Twitter usage pattern during the 2010 mid-term US elections; they suggest that conservative candidates had used the medium more effectively for campaigning. Ammann (2010) in analyzing the same data found that most tweeting by Senate candidates was informational and had no correlation to voter turnout.

A spike in Twitter research in the US context happened last year when we witnessed the 'most tweeted' political event in history, the 2012 US presidential elections. Studies (Conway et al. 2013; Hong and Nadler 2011) measuring the potential impact of Twitter on 2012 US presidential elections found that while Twitter expands possible modes of election campaigning, high levels of Twitter usage by election candidates did not result in their greater popularity or greater level of public attention they received online. Christensen (2013) went beyond the two-party constructs of most other studies and built a broader framework identifying Twitter usage by minority party or 'third party' presidential candidates during election. He found that third parties were more frequent in discussing marginal issues and their tweets were a useful indicator of the topics and issues important to minorities within the US political system.

Zhang et al. (2013) investigated the impact of different types of social media tools on voters' attitudes and behavior during the 2012 U.S. presidential campaign. Based on their findings, they suggest that political parties can utilize the political activism fostered by social media tools like Twitter to empower and mobilize their supporter.

In other parts of the world, Bruns and Highfield (2013) tracked specific interactions between Australian politicians and the public during 2012 election in the Australian state of Queensland and found different approaches adopted by specific candidates and party organizations during the state elections. Graham et al. (2013) analyzed tweets by the candidates in the 2010 UK General Election and found that some candidates specifically used Twitter as a tool for mobilization and relationship formation with the citizens, but Aragón et al. (2013) suggest most parties usually tend to use Twitter just as a one-way flow communication tool. Vergeer et al. (2013) studied the micro blogging during the 2009 European parliament elections in the Netherlands and found low rate of Twitter usage as a campaigning tool. Vaccari and Valeriani (2013) analyzed the 2013 Italian general election and noted that the average followers of even the most followed politicians were inactive and not well-followed; very tiny minorities accounting for the vast majority of retweets and information dissemination.

The Case of the 2013 Pakistan General Election

Pakistan is a federal parliamentary democratic where at the national level, citizens above the age of 18 elect a bicameral legislature, the Parliament of Pakistan, which comprises of a directly elected National Assembly (lower house of the Parliament) and Senate (upper house of the Parliament), whose members are chosen by elected

provincial legislators. On 11th May 2013, Pakistan elected the members of its 14th National Assembly. This was an important landmark in Pakistan's political history, because for the first time the country witnessed a civilian transfer of power after the successful completion of a 5 year term by a democratically elected government. It suggested that Pakistan had finally overcome the clutches of the military dictatorship which overshadowed more than half its 66-year history.

Since its independence, Pakistan has seen epic socio-economic changes; but the politics in the country has been characterized by the dominance of old political parties who continue to engage in dynastic 'family' politics to keep their vote bank intact. Pakistani politics over the years has been dominated by Bhuttos and Zardari of Pakistan People's Party (PPP) and Sharifs of Pakistan Muslim League Nawaz (PMLN) with support from secondary parties such as Muttahida Quami Movement (MQM), Awami National Party (ANP) and Jamiat Ulema-e-Islam (JUI). The stability of the government and the organization of parliamentary elections is challenged and threatened by the domestic militant and separatist groups. The umbrella group of Pakistan Taliban, Tehreek-e-Taliban Pakistan (TTP) urged the public to boycott the 2013 general elections and warned the candidates of political parties' such as PPP, MQM and ANP. Despite the unprecedented level of violence during the campaign, the 2013 General Election in 272 constituencies across four provinces of Baluchistan, Khyber Pakhtunkhwa (KPK), Punjab and Sindh along with Federally Administered Tribal Areas (FATA) and Federal Captial of Islamabad saw a record voter turnout of over 60 %, a marked improvement over the 44 % turnout during the 2008 elections.

The elections saw the return to power of former Prime Minister Nawaz Sharif, once a political exile deposed by the military. Notably, the elections marked the prominent rise of the 'unknown factor' Imran Khan and his non-dynastic centrist party PTI. Throughout the election campaign PTI spelled out a vision of transparent government in a modern Islamic republic focusing on the power of the youth in Pakistan. Also as outlined from their policies PTI appealed for a true democracy involving active participation of the people in elections—a call to vote and constantly criticized the US drone attacks in tribal areas of Pakistan demanding for strong protests by political parties. PTI last won even a single seat in the national assembly in the 2000 General Elections; however, the 2013 elections saw the party emerging as the third most successful national party securing second highest number of votes, winning a major province, KPK, and also winning key seats in three provincial capitals. Building on his surging popularity as a nationally revered cricketing hero, Imran Khan won three out of four seats he contested for.

As of this article, social media usage is a rising trend in Pakistan, with 8 million Facebook users and 3 million Twitter users. As a result, the 2013 elections in Pakistan was also the first 'social media' election (McKenzie 2013) when the well-known, dynastic political parties such as PMLN, PPP and MQM as well as the challenger, PTI, turned to Facebook and Twitter to promote and connect with citizens before and during elections. This move to social media platforms was motivated not only by the aim to connect to wider audiences and optimize party visibility, but also as a safeguard to deter acts of violence. Violent attacks on political rallies are a

common occurrence in election campaigns in Pakistan, and social media helped as a convenient and safe campaign platform for parties to limit holding political events in sensitive areas (McKenzie 2013).

9.3 Research Questions

A well-crafted social media campaign hugely led by Twitter has become a norm in the elections of most modern democratic societies which have high Internet and social media penetration; but what role Twitter can play in the general election of a society like Pakistan, with over 80 million voters and less than ten percent Internet penetration? This study is a step towards answering this question, with the aim to characterize the Twitter campaign strategy of the top four political parties in Pakistan during the 2013 General Election, with a special emphasis on the online campaign strategies of PTI. We posit the following research questions:

- RQ1: Which political party was most frequently using Twitter during the elections in Pakistan?
- RQ2: To what extent and with whom were the political parties interacting on Twitter?
- RQ3: How was the interaction (a) between parties and (b) within parties and their sub-organizations on Twitter?
- RQ4: What functions did the tweets by these political parties serve?
- RQ5: What were the key societal and political issues discussed by these parties on Twitter?
- RQ6: How did PTI's usage of Twitter differ from that of other political parties and how did this relate to their success in the national election?
- RQ7: What is the relationship between PTI's provincial success and the increase in voter turnout?

9.4 Methodology

Data Collection

The present analysis involved two stages of data collection. The first stage of analysis was conducted on an archive of tweets posted from midnight on 10th April, 2013 (Pakistan Standard Time) to midnight on 14th May, 2013. We started to collect the data from 10th April, 2013 in order to collect data for 1 month period before the general elections which was scheduled for 11th May, 2013. In the process, we collected a total of 10,140 tweets posted by the top four political parties (PMLN, PPP, PTI and MQM) and their leaders. The tweets were downloaded in tab-delimited text format from Topsy (http://www.topsy.com/), an archive of the public Twitter stream. For this time period, we downloaded 10,140 "significant" tweets,

Table 9.1 Coding scheme for Stage 1: identifying type of tweet

Category	Category description
Mention of party leader (@partyaccount)	A tweet which referenced (or mentioned) other Twitter account(s) belonging to the party's leader(s)
Reply (@xyz)	A tweet which was a reply addressed to the Twitter account(s) mentioned within it
RT (Retweet)	A tweet which was a re-posting of a tweet from a different source
Normal post	Any tweet which did not fall under the above categories

i.e., tweets containing links or retweets. Every tweet included information about the tweet's text, its timestamp, username, type of tweet (tweet, link, image or video), hits, trackbacks, embedded links and mentions.

For the second part of our analysis we collected the publically available statistical data related to Pakistan General Election 2013 provided by the Election Commission of Pakistan (ECP) at their official website www.ecp.gov.pk.

We focused on Twitter data only, because we anticipated that a telecom-Twitter tie-up in Pakistan, allowing free Twitter posts by mobile subscribers, gave Twitter wider outreach and more accessibility than other social networks such as Facebook. We considered only English language tweets and filtered out tweets in other languages such as Urdu, which accounted for 158 or 1.5 % of the total tweets collected. Clearly this is a small number compared to the total number of English language tweets, so we anticipate that discarding them will not impact our findings.

Coding Categories

A manual content analysis was employed as the principal mechanism for examination where an individual tweet was the unit of analysis. The first stage of coding scheme focused on the type of tweet. In Twitter terminology, a tweet is a micro-blog post. Besides posting original content in a normal post, a tweet could also be a mention of a different Twitter user, a reply to a tweet by another Twitter user, a retweet or reposting of a tweet posted by someone else. In the context of Twitter political campaigning, the following four tweet types were established (Table 9.1):

Once the types of tweet were established we moved to the second stage of coding scheme where @ replies were consequently coded to understand with whom were the parties interacting through their tweets. For assurance of classification of a user's profile the coders first checked the user's profile and then if needed clicked on the user's profile details to find more information and then classify the user accordingly into respective category. The categories are mentioned in Table 9.2.

At the final stage of the coding scheme, partly based on approach tested previously in Twitter research (Graham et al. 2013) the tweets were coded for their function. In cases where the tweet could fall into two or more functional categories, coders were asked to pay attention to the dominant functional category. These cat-

Table 9.2 Coding scheme for Stage 2: identifying Twitter accounts with whom interactions are taking place

Category	Category description and example
Politics	Twitter account of any political party or politician from Pakistan
Media	Twitter account of a journalists or news source within or outside Pakistan
Public	Twitter account of a citizen within or outside Pakistan
Other	Any Twitter account which did not fall under the above categories

egories are presented in Table 9.3. A team of four coders were employed to code the tweets for the above mentioned categories. The inter-coder reliability was tested by randomly selecting 25 % of the coded tweets by each coder and the reliability was found to be satisfactory.

Word Cloud and N-Gram Phrase Extractor

For a preliminary frequency analysis of words in text, we generated word clouds from the tweet streams of individual parties. Word clouds are a method of visualizing text frequencies, in which the more frequently appearing words in a source text are rendered in bigger sizes to give them greater prominence in display. We used an online word cloud generator hosted at Wordle.net; the developer describes that this tool is useful to get the "portrait" of interests mentioned in the text (Feinberg 2010). We anticipated that the visualization would give us a convenient way to compare the main concerns and interests of the political party Twitter accounts.

Similarly, we compared the frequently recurring phrases in the tweet streams by using the N-Gram Phrase extractor hosted at the website, Compleat Lexical Tutor (http://www.lextutor.ca/tuples/eng/). N-grams refer to contiguous phrases of "N" length which are generated from provided text. The N-Gram Phrase extractor tool is suitable for analyzing really short texts, such as those in a tweet, and extracting recurring phrases and displaying the output in varying spans of co-text (usually 17–20 words) with the phrases centered and listed in alphabetical order. Information about how many times a phrase, or a "lexical bundle" occurs in the text is reported to the left of the page with phrases listed alphabetically. Since this program reports only those lexical bundles that recur in the text or file submitted by the user, it provides a good way to examine the extent and type of lexical bundles that their political parties are applying in their writings. To improve the counting of repetitious phrases, the N-Gram Extractor notices and discounts up to three intervening words so that phrases like "a car" and "a big car" are counted as repeated units. Furthermore, by reducing all words to their family headwords, the software is able to identify and collate phrases such as "I go home" and "He goes home". Accordingly, we set the program to extract and count all phrases ranging from two to four words in length and to consider intervening words and family headwords. We anticipated that iden-

Table 9.3 Coding scheme for Stage 3: functions of the tweets posted by party Twitter accounts

Category	Category description and example
Campaign updates	Tweets comprising updates on upcoming political rallies or events in the political campaign e.g: *Historical Campaign officially starts tomorrow 20th April as @ImranKhanPTI will lead the Tabdeeli Express -car, bike rally in Lahore*
Promotion	Tweets to promote self-interests e.g: *If the Internet were the only electorate, @ImranKhanPTI would be victorious by a landslide @InsafPK most used political website*
Criticism	Tweets which criticize the current government's policies e.g: *Why the current caretaker govt is not taking notice of the killings of workers?*
Call to vote	Tweets which made a proclamation for citizens to come out and vote e.g: *Vote for any party but GOTV-Get Out To Vote*
Political news	Tweets comprising news updates pertaining to Pakistan or world politics e.g: *News: Rehman Malik offers condolences to Quaid Altaf Hussain on the killing of Fakhrul Islam*
Other news	Tweets comprising news updates which were not from the political domain e.g: *Gallup Pakistan is an assoc with UK-based Gallup International Association, which works primarily through its website!*
Party details	Tweets which provided details about constituents, nomination or candidates e.g: *PTI is the only party that has given 35% of its electoral tickets to youth*
Other	Any tweets which did not fall under the above categories e.g: *Salman Ahmed (Junoon) performs at AvariTowers for NA252.Sun 5th May. 2 pm*

tifying and analyzing lexical bundles would reveal a lot more about the central issues or claims which political parties were iteratively targeting in their Twitter campaign.

Social Network Analysis

To better understand the characteristics of the online network community formed by the Pakistani political parties and their leaders on Twitter, we conducted a social network analysis. We used Gephi 0.8, a tool developed by Bastian et al. (2009), to analyze formed network and visualize it. For social network graph rendering, we wanted to identify how the Twitter accounts were connected to one another, which is why we chose to visualize the network with the Harel-Koren Fast Multiscale layout.

Table 9.4 Twitter followers and social influence score of parties and their respective leaders

User	Twitter ID	Followers	Klout score
PTI	@PTIofficial	140714	73
Imran Khan	@imrankhanpti	627651	78
PMLN	@pmln_org	17499	63
Nawaz Sharif*	@MaryamNSharif	93592	66
PPP	@MediaCellPPP	2299	60
Bilawal Bhutto	@BBhuttoZardari	51496	61
MQM	@OfficialMqm	11770	64
Altaf Hussain	@allaboutmqm	10389	62

*Nawaz Sharif did not have a Twitter account before the election. However his daughter Maryam Sharif (@MaryamNSharif) regularly used Twitter to post tweets related to Nawaz Sharif, hence, we included her tweets for our analysis

9.5 Findings

Our findings are presented in two parts. First we analyzed the collected data from Twitter API and the respective results are presented as Tweet Analysis in Sect. 5.1 and secondly the analysis for the election results data gathered from ECP's website are presented as Election Analysis in Sect. 5.2.

Tweet Analysis

Table 9.4 provides the descriptive statistics for the parties and their Twitter accounts. Evidently, PTI and its leader, Imran Khan, have the greatest number of followers as compared to other parties and their respective leaders. The Table also provides the Klout scores for the individual Twitter accounts. Klout measures users' online social influence based on how others engage with their content. Although the algorithm behind Klout, which is based on more than 25 variables, has not been published, it is based on a user's interaction with others in their social networks and the networks' reaction to the user's activity. The Klout scores for the Twitter accounts of PTI and Imran Khan were higher than those of other parties and politicians.

The answer to the first research question, RQ1, required a simple frequency analysis of the tweets posted by the top four political parties. Figure 9.1 provides a timeline illustrating the distribution of tweets throughout the observed period of 10th April to 14th May 2013 for PPP, MQM, PMLN and PTI.

The trendline for each party is characterized by several small spikes in frequency, leading up to the highest spike on Election Day itself, on 11th May. The smaller spikes before the Election Day likely correspond to offline events including major political campaigns. From the Fig. 9.1, PTI emerges as the most active party on Twitter during the campaign period and the day of election. There was an exception on 18th April when PMLN announced its candidates list.

Figure 9.2 shows trendlines for only PTI's tweets, specific to the five provinces of Baluchistan, KPK, Punjab, Sindh and FATA/Federal Capital. Tweets specific to KPK were found to be consistently high in this analysis.

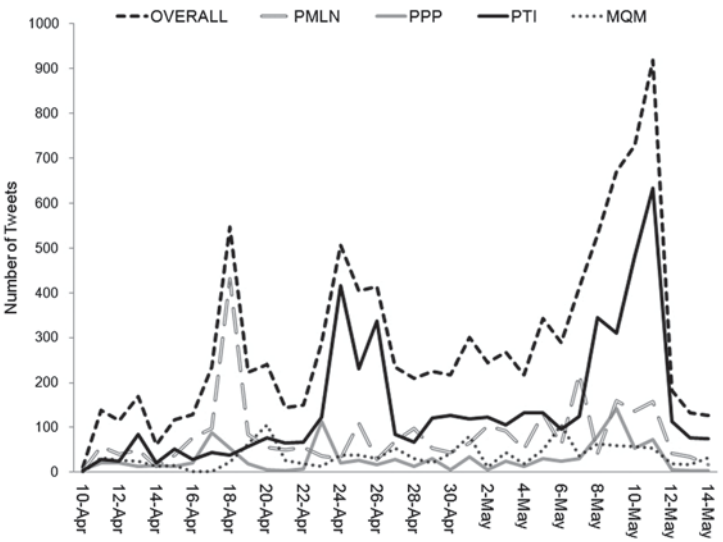


Fig. 9.1 Timeline of tweets

To answer the second research question, RQ2, we identified the types of tweets and their percentage distribution for each of the four political parties and the findings are provided in Table 9.5. We found that political parties were using Twitter quite differently from each other. PTI was again the leader in interacting with users (21% of their tweets were replies). They were second to PPP in mentioning their party leader in their tweets. They may have been highlighting their party leader, Imran Khan, because his popularity and fan-following—as of this study, he is the most followed Twitter user in Pakistan. On the other hand, PMLN and MQM used Twitter to moderately interact with their followers.

It was imperative to understand with whom were these parties interacting on Twitter. Figure 9.3 reveals the results as the two most frequent parties on Twitter, PMLN and PTI were largely interacting with the public while PPP and MQM interacted with politicians. It is noteworthy that PTI were once again ahead of other parties in interacting not only with the public but also the media. This can be explained by the fact that PTI is the only non-historical party in Pakistan politics and is more in need of traditional media presence as well.

To answer RQ3, it was necessary to identify the prevalence, if any, of discussions between and within party Twitter accounts. We followed the approach adopted by most scholars (Grant et al. 2010) and constructed a network based on instances of conversations (at least one tweet in either direction) involving the Twitter accounts of one or more political parties or their leaders or their regional branch. To render the social network, the Harel-Koren Fast Multiscale layout was used to cluster tightly connected users to one another. Clusters appear to exist in the network graph but they are largely exclusive and not much interaction between parties was visible. However,

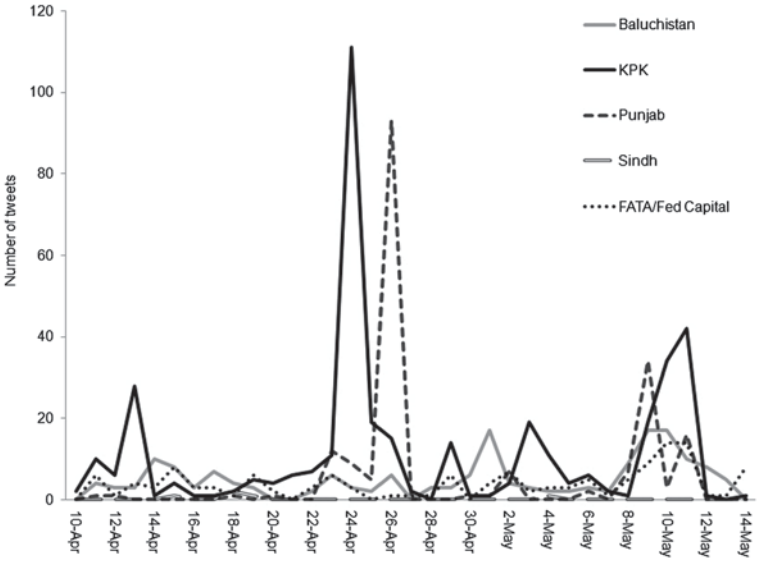


Fig. 9.2 PTI tweets specific to provinces

Table 9.5 Tweet type break up

Tweet type	Party account			
	PMLN	PPP	PTI	MQM
Normal post	2230	723	3499	1039
	78.4%	67.9%	70.5%	81.9%
@-Replies	387	35	1020	190
	13.6%	3.3%	20.6%	14.9%
Mention of party leader	166	256	355	37
	5.8%	24.0%	7.2%	2.9%
Retweet	62	51	88	2
	2.2%	4.8%	1.8%	0.2%
Total	2845	1065	4962	1268

when we focussed only on PTI tweets we did find interaction between PTI's official account and its leader (@imrankhanpti) and other sub-organisations (@ptikpkofficial, @ptipnjbofficial) as visible in Fig. 9.4. We tested the PTI network for actual clustering coefficient (C) and average path length (L). The results showed L=2.937, C=0.891 signifying a small world network. This reveals that PTI used the medium for unmediated connection amongst their sub-divisions and leader, Imran Khan.

In preliminary analysis for RQ 4–5 to identify what Pakistani political parties and politicians were tweeting about, we first generated word clouds from their parties' tweets. Word clouds are a method of visualizing text frequencies, in which the more frequently appearing words in a source text are rendered in bigger sizes

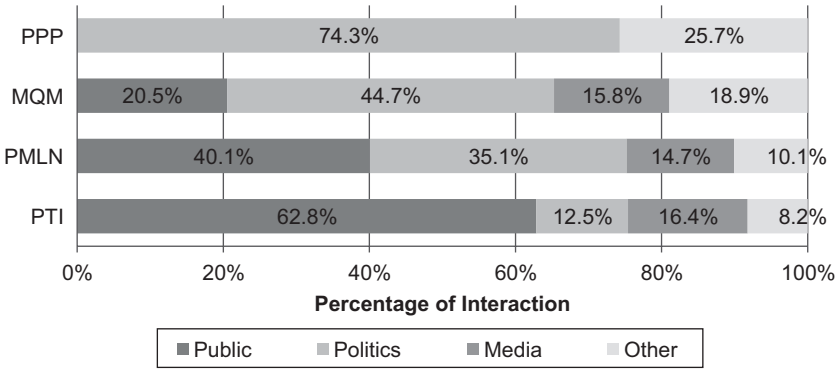


Fig. 9.3 Percentage of interaction

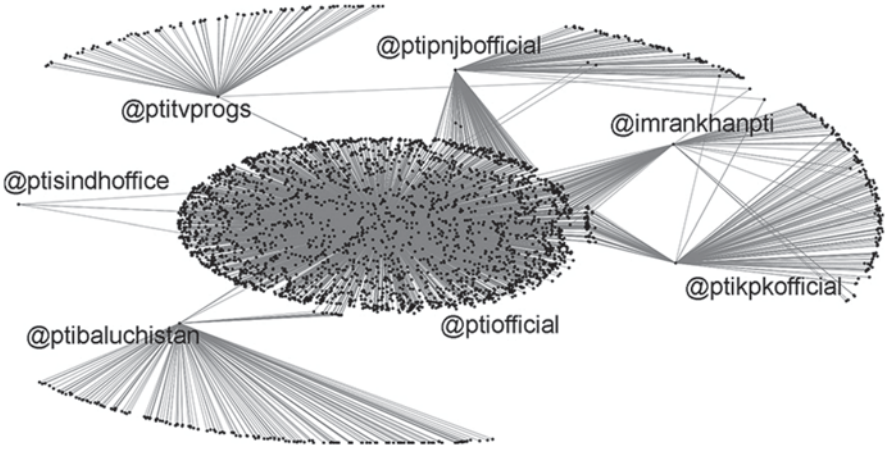


Fig. 9.4 Dialogues amongst PTI members in Twitter. (with a minimum of one tweet in each direction. Image generated using NodeXL, using Harel-Koren Fast Multiscale)

to give them greater prominence in display. Figures 9.5, 9.6, 9.7, 9.8 present word clouds of Pakistani political parties' tweets and provide an emblematic illustration of the topics discussed in their tweets.

A deeper content analysis was then conducted to identify the functions of tweets posted by each of the political parties. Figure 9.9 reveals that the top three parties PMLN, PPP and PTI predominantly used Twitter for posting updates about their campaign and also as a platform for campaign promotion. It shows that PTI were ahead of other parties in campaign updates via Twitter but used it less as a criticism tool to criticize other parties and politicians, while MQM used the platform more for criticism than any other function. The most significant finding was the use of Twitter to call out the voters to exercise their right to vote. While most other parties rarely used Twitter to urge citizens to vote, approximately every one out of ten PTI tweets urged the users to vote.

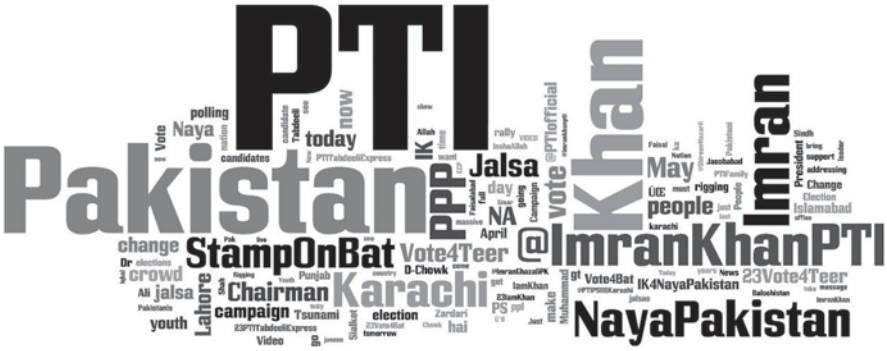


Fig. 9.5 Word cloud of PTI's tweets

Fig. 9.6 Word cloud of PMLN's tweets

RQ5 investigates the other key issues of development being discussed by political parties. First, we used N-Gram Phrase Extractor to extract the most frequent terms and keywords used in the subset of tweets from each party. From the overall results, we limited our analysis on the top 25 two-word and three-word strings as these accounted for maximum repeated usage and would reveal the importance of issues in party discussions. We then removed the terms related to campaign updates and promotions (e.g.; "Campaign coverage by", "from NA-128", "today polling station") to focus only on issues (if any) discussed by the parties. We then manually clubbed the frequently occurring words into common themes. The top discussed themes (issues) and the common frequent words (two-string and three-string) are listed in Table 9.6.

Fig. 9.7 Word cloud of PPP's tweets

Fig. 9.8 Word cloud of MQM's tweets

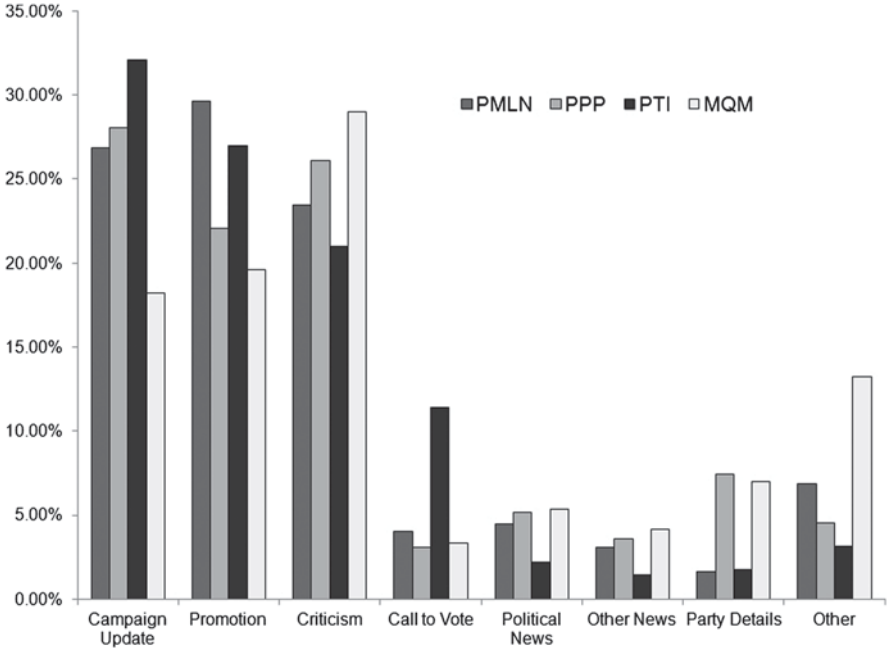


Fig. 9.9 Major functions of tweets

Table 9.6 Twitter followers and social influence score of parties and their respective leaders

Party	Themes and related frequent phrases
PMLN	1. *Energy Crisis*: Energy problems, load shedding, power cut 2. *Health Issues*: Eradicate dengue, eradicate malaria, dengue loss
PPP	1. *Women Empowerment*: Treats women equally, deprived her rights, equal status, Benazir Bhutto attack 2. *Bomb Blasts (Karachi)*: Karachi bomb blasts, expressed grief, strongly condemns, incidence of violence
PTI	1. *Voting Rights*: Overseas Pakistani vote, postal ballot option, voting tsunami wave, cast your vote, election rigging 2. *Youth*: PTI youth policy, PTI youth candidates, youth to vote, support for youth 3. *Drone Attacks*: Drone strikes illegal, drone if it, deal allowing drone
MQM	1. *Bomb Blasts (MQM office)*: Demonstration against Taliban, Taliban claims responsibility, attack on, condemns bomb blasts, blasts near, we strongly condemn

Table 9.7 Seats and votes won per party

Rank & party	Total seats	Seats per province					Votes won	Candidates	
		Baluch-istan	KPK	Punjab	Sindh	FATA/ Fed cap		No. fielded	Avg votes secured
1. PMLN	126	1	4	117	1	3	14,794,188	220	67,246
2. PPP	33	–	–	2	31	–	6,822,958	226	30,190
3. PTI	28	–	17	8	1	2	7,563,504	232	32,601
4. MQM	18	–	–	–	18	–	2,422,656	205	11,818

Election Analysis: Seats and Popularity

Considering the actual results of the 2013 Pakistan General Elections, Table 9.4 shows that PMLN was the most successful (126 National Assembly seats) and the most popular party (14.8 million votes). PTI was third on the number of seats won (28 seats) and the second most popular party in Pakistan with nearly 7.6 million votes.

Table 9.7 shows that other than the leader PMLN, PTI also gathered more votes per candidate (32,601) as compared to other parties. In the detailed party performance to understand the voting patterns across provinces, it is evident that each province favored a particular party. PMLN won the majority at the national level—but their performance was largely based on the success in Punjab. PPP were largely successful in Sindh while MQM won all their seats from Sindh. PTI dominated KPK, but it also won some seats from Punjab, Sindh and FATA/Fed Cap.

Election Analysis: Voter Turnout and Increase in Votes Polled

The Election Commission of Pakistan declared that the overall voter turnout in the Pakistan general elections 2013 was 55.02%—an approximately 11% increase since the last general elections in 2008. We compared the province-wise voter turnout for 2008 and 2013 to check whether this had a role to play in PTI's success.

Keeping the voter turnout for the 2008 general elections as base (100%) we plotted the turnout for the 2013 general elections to identify the increase in number of votes polled per province. The results are displayed in Fig. 9.10. There was a jump of 29.68% in the number of votes polled nationally in 2013 compared to the polled votes in 2008. Notably, the most prominent increase in votes polled was in the province of KPK (53.12% increase). This was also where PTI achieved the most success and won 17 National Assembly seats. KPK was followed by FATA/Fed Capital where the increase was 40.50%. Also PTI was the second most successful party in Punjab, FATA/Fed Capital which recorded a significant increase in votes (34.1 and 40.5%). The two provinces which faired below the national average of increase in votes, Sindh (13.1%) and Baluchistan (−4.9%) were the provinces where PTI

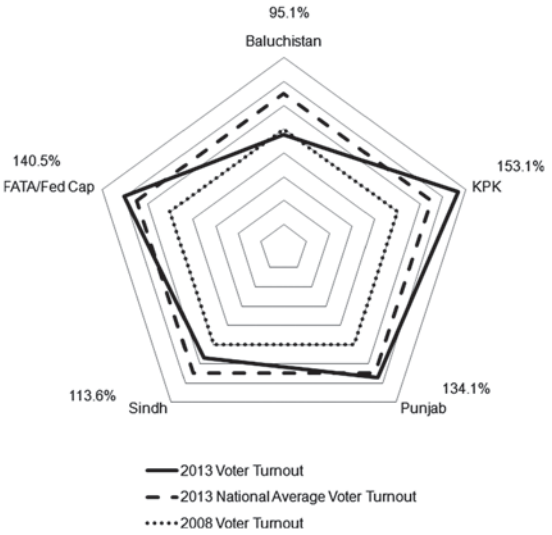
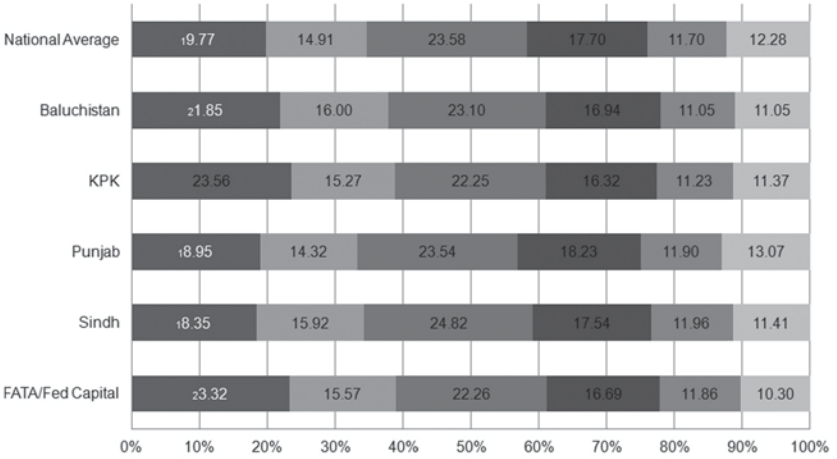


Fig. 9.10 Increase in votes per province



	FATA/Fed Capital	Sindh	Punjab	KPK	Baluchistan	National Average
18-25	23.32	18.35	18.95	23.56	21.85	19.77
26-30	15.57	15.92	14.32	15.27	16.00	14.91
31-40	22.26	24.82	23.54	22.25	23.10	23.58
41-50	16.69	17.54	18.23	16.32	16.94	17.70
51-60	11.86	11.96	11.90	11.23	11.05	11.70
61+	10.30	11.41	13.07	11.37	11.05	12.28

Fig. 9.11 Province-wise voters' age distribution

did not fare as well, by winning just one National Assembly seat in Sindh and not recording victory in Baluchistan.

Election Analysis: Voter Age Group

2013 was deemed as Pakistan's first 'youth election'. When we analyzed the data for the voter age group, our results established the same. On the national level, about 35 % of the voters were under the age of 30 years. 20 % of the total comprised youth in the age group of 18 to 25 years (Fig. 9.11). At the province level, we found the majority of the youngest eligible voter population in the province of KPK, with approximately 24 % of the population between the age group of 18 to 25 years. This was a major difference when compared to other significant provinces of Punjab and Baluchistan.

9.6 Discussion

This study focused on the usage of Twitter in the general elections of a democratic society which is not only characterized by low social media penetration but faces threats of ethnic and political violence in its dynastic political environment. The question posed here was if Twitter as a campaigning tool can make a difference in the general elections of such a society?

Our findings revealed that a new and upcoming political party, PTI, used the medium in an effective manner and were the most benefitted by their social media participation, which helped them to win nearly 30 seats in the National Assembly in 2013 elections, as compared to none in the previous election. PTI applied a combination of strategic online and offline campaigning led by the youth, which emphasized a call for action against corruption in the country. Imran Khan led extensive on the road campaigns in Punjab, a province where PMLN historically holds a strong hand. On 26th April, Imran Khan attended 32 public gathering within six hours to cover large grounds and all the updates related to campaigns were regularly updated on Twitter. However in Karachi, a city with a population of 20 million people that saw all the parties holding extensive public rallies, PTI stayed away and did not organize even a single campaign event during the elections. PTI strategically and solely focused on online activities in Karachi as the city has disproportionally high percentage of youths within its population who are actively connected to the Internet. This proved successful as the party became the second largest party in the city after winning an important national assembly seat and three provincial assembly seats. Thus what we observe is Twitter presenting itself as a direct force in election campaign in some provinces while acting as an additional facilitator in others.

Overall, PTI evolved as the most dominant party on Twitter and this is in accordance with previous arguments too (Christensen 2013; Lassen and Brown 2011) which suggest that minority parties are usually most active online after being drawn

to the medium for lack of television and mainstream media exposure. These parties (PTI in the case of Pakistan) face incredible challenge in reaching out to the public, and thus voters, partially due to the symbiotic relationship between the traditional mass media channels and the leading political parties.

If we compare PTI's online campaign to the election studies in the US, we note that their approach seems to be inspired from Obama's social media team in 2008, who also favorably exploited Twitter to their advantage and in a way set a trend of using the tool for election campaigning. PTI was most active in uploading a large selection of campaign photos and videos and providing real time updates of Imran Khan's campaign activities from the ground. This is reflected in the trendline for PTI in Fig. 9.1, when we see a mini peak for PTI on the 24th April, the day when Imran Khan held press conferences discussing a more credible polling system. Similarly we see another mini peak on 8th May just before the Election Day, as this was the day when Imran Khan was injured after falling from a makeshift stage during a campaign rally in Lahore. The correlation of online and offline activity concurs with other Twitter-politics research (Bruns and Highfield 2013; Larsson and Moe 2012) which shows that the online social media activity peaks in relation with major offline events, including campaigns and wide political events.

The political social media campaign of Obama and Khan are also similar in the way they emulate the personality politics paradigm. Political campaigns emphasize the personalities of their candidates to capture the voters' attention, exemplified in Obama's campaign and subsequent triumph in the 2008 and 2012 US Presidential Election (Wayne 2011). The popularity of political actors also impinges on personal relationships in numerous ways, often with significant consequences. Imran Khan is the most followed Twitter user in Pakistan and this speaks volumes about his popularity, at least in the online sphere. PTI's political campaign on Twitter was built around the Khan persona, being moderately frequent but not overwhelming in direct mentions of their leader in their tweets. A similar approach was followed by PPP whose former leader and late Prime Minister Benazir Bhutto, the first woman prime minister of Pakistan, was assassinated during a campaign rally in 2007.

Political parties use Twitter primarily as a tool for interaction. Our analysis found that almost every party focused on a different issue based on their party agenda. PMLN raised concerns about the energy crisis within the country and criticized PPP due to frequent electricity breakdowns (sometime up to 18 h a day at the peak of summer. PPP built on the agenda of its former Prime Minister Benazir Bhutto and concentrated on their work and importance of socio-economic development and empowerment of women. MQM were critical of the bomb blasts by Taliban near its office in Karachi. PTI's tweets focused on issues of drone attacks. However, quite different to other political parties, PTI were also extremely active in promoting voting behavior and focusing on youth. Their focus on capturing the youth's attention is a tactical move considering the overwhelming numbers of young voters in Pakistan; a majority of them were likely connected to the online world and helped to turn the party's luck. Out of an electoral list of 83 million voters, 47 % of the voters were under the age of 35 and 30 % under 30 years. According to the National Database Registration (NADRA) 30 million voters were newly listed in the electoral rolls,

out of which a high proportion turned 18 years only in the last 3 years. Hence, PTI maximized the medium to connect to youth and discuss their issues.

Our finding revealed that PTI maintained a strong online interactive presence at two levels: internal and external. Primarily, the party was active in connecting between the main account and its sub-organization accounts with a strong focus on interaction with KPK and also its chairman, Imran Khan. Where most political parties had one or maximum two Twitter accounts to connect with the public and others, PTI had one main account (@ptiofficial), four regional accounts (@ptipnjbofficial, @ptikpkofficial, @ptibaluchistan and @ptisindhoffice), one account dedicated to television program (@ptitvprgos) updates along with Imran Khan's account (@imrankhanpti). With these accounts, PTI created a small world network consistently engaging citizens and others within and outside of their network.

At the secondary level, PTI interacted with the public; in fact, they were the most active in interacting with the electorate and promoting the character of Imran Khan as a potential prime minister. Interaction over Titter bypassed traditional media "gatekeepers" such as newspaper or television journalists, which are responsible for filtering, editing and interpreting a party's messages to the citizens.

9.7 Conclusion

The 2012 General Election was one of the most successful elections in Pakistan's political history. Although we cannot establish prime causal factors, but our analysis did find PTI to be ahead of all other parties in calling out the citizens to exercise their voting rights. This action reflected their election manifesto where they had criticized the low voter turnout figures and urged the citizens to contribute toward the democracy in Pakistan. Their offline action of pushing the ECP to grant voting rights to overseas Pakistanis (present day Pakistani constitution does not enable Pakistanis settled abroad to vote in general elections) supplemented their online action and political intention of bringing Pakistan closer to a true democracy.

PTI's success at the provincial level and more specifically in KPK reflects the way they successfully wielded Twitter as a political campaign tool. Probably the greatest contributors to their win were the high percentage of voting population under the age of 25 and the overall increase in number of votes. These factors combined with PTI's focus on KPK through their Twitter activity and on the road campaigns resulted in a strong success in the region.

To sum up, our findings indicate that Twitter can play a significant role even in a fragile societal and political environment like Pakistan. PTI's offline strategies and their online involvement on Twitter signifies that the medium can be robustly used to involve more people in a democratic process, especially the youth, by providing them with campaign updates, interacting with them and mobilizing them to vote.

Notes An earlier version of this study was presented at the 47th Annual Hawaii International Conference on System Sciences (Ahmed and Skoric 2014).

See [Ahmed, S., & Skoric, M. M. (2014, January). My name is Khan: The use of Twitter in the campaign for 2013 Pakistan General Election. *Proceedings of the 2014 47th Hawaii International Conference on System Sciences* (pp. 2242–2251). Washington, DC: IEEE Computer Society]

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Chapter 10
The Decalogue of Policy Making 2.0: Results from Analysis of Case Studies on the Impact of ICT for Governance and Policy Modelling

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Abstract Despite the availability of a myriad of Information and Communication Technologies (ICT) based tools and methodologies for supporting governance and the formulation of policies, including modelling expected impacts, these have proved to be unable to cope with the dire challenges of the contemporary society. In this chapter we present the results of the analysis of a set of promising cases researched in order to understand the possible impact of what we define 'Policy Making 2.0', which refers to 'a set of methodologies and technological solutions aimed at enabling better, timely and participative policy-making'. Based on the analysis of these cases we suggest a bouquet of (mostly ICT-related) practical and research recommendations that are relevant to researchers, practitioners and policy makers in order to guide the introduction and implementation of Policy Making 2.0 initiatives. We argue that this 'decalogue' of Policy Making 2.0 could be an operational checklist for future research and policy to further explore the potential of ICT tools for governance and policy modelling, so to make next generation policy making more 'intelligent' and hopefully able to solve or anticipate the societal challenges we are (and will be) confronted today and in the future.

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10.1 Introduction

The world has become increasingly interconnected, complex, and fast evolving, with the effects of policy choices and individual behaviour becoming much less predictable (Misuraca et al. 2010; Osimo et al. 2010; Charalabidis et al. 2010). Despite the thoughts and visions of previous generations, the first signs of the twenty-first century show that human society faces not only challenges that are deeply rooted in the past, but also a fairly new set of issues that are global in scale and highly dynamic, following the globalisation trend and the fast paces of our economies. In this respect, uncertainty and complexity are two distinguishing characteristics widely recognized in the literature of complexity science, chaos theories and non-linear systems. Highly improbable events (Taleb 2008) and "wicked problems" (Rittel and Webber 2008), which are outside the range of predictability based on past behaviours, dominate our lives as the (still on-going) financial and economic crisis has proven. To formulate adaptive policies for the future of the globally connected world, and for responding to today's crises, requires the simultaneous consideration of many factors, different types of data and how these interact (Bishop and Baudains 2010).

In such an evolving governance landscape, Information and Communication Technologies (ICT) are important enablers for handling complexity and for driving state re-organization, openness and effectiveness in collaboration with citizens, businesses and society. In this regard, the concept of "Policy Making 2.0" emerged in the recent years and it can be defined as 'a set of methodologies and technological solutions aimed at enabling better, timely and participative policy-making' (CROSSOVER 2012b; Mureddu et al. 2012; Misuraca et al. 2014).

As a matter of fact, 'Policy Making 2.0' can be considered as an umbrella term enfolding a number of ICT-based applications which can be mapped into several overlapping areas: Web Technologies, Systems and Services Technologies, Social Informatics and Management tools, the boundaries among which are not well defined. Moreover, it is expected that the combination of emerging Web2.0 and ICT-enabled applications for collaborative governance which are largely practice-led and market-driven, with the domain of 'modelling' which includes different academic traditions (e.g. econometric forecasting tools, sociology of social networks analysis, societal simulation, engineering, mathematics and artificial intelligence involved in system dynamics and multi-agent modelling) could have a potential positive impact on how governance and policy-making operate (CROSSROAD 2010; Charalabidis et al. 2012; CROSSOVER 2012b; Misuraca 2012; Mureddu et al. 2012).

In general terms, in fact, modern approaches in policy making, taking into account political, economic, social, technological, environmental and legal repercussions, consider a variety of different disciplines ranging from complex systems, decision support systems, and public administration concepts, to operational research models. However, the current tools available for policy design, implementation and evaluation still seem ill suited for capturing the society's complex and interconnected nature (Charalabidis et al. 2012; CROSSOVER 2012b; Misuraca 2012).

At the same time, social media appear as a global phenomenon around cooperation (Khan and Park 2013), collective intelligence, users generating content, sharing and connecting, with a disruptive impact on all aspects of society, government, and business (Chadwick 2009; Chang and Kannan 2008; Kavanaugh et al. 2012; Millard 2009). Furthermore, during the last years, a plethora of bottom-up initiatives (Bertot et al. 2010a; Lampathaki et al. 2010; Osimo 2008; Barkat et al. 2012; Leighninger 2011) to promote transparency, collaboration and better policy making have also emerged creating a new landscape of communication between society and the governmental authorities.

As it becomes obvious, a new age of engagement has emerged, leveraging social media for policy making as they facilitate the requisite level of collaboration both globally and locally to solve complex issues that would otherwise be impossible to address (Bertot et al. 2010b; Macmillan et al. 2008). Such communication channels make the process of engaging citizens in policy easier and less costly than ever before (Mergel et al. 2009), and citizen engagement is introduced into the policy process by using citizen sourcing to enlarge and enhance policy-advisory processes, policy making, and policy feedback (Nam 2012). As a result, a vast array of ICT-based applications, often referred to also as Government 2.0, can now provide new sources for policy advice, enabling policy makers to bring together divergent ideas that would not come from traditional sources of policy advice (Lukensmeyer and Torres 2008).

In this context, it can be considered as highly important and beneficial to study a set of best cases regarding Policy Making 2.0. Through the identification and objective verification of high impact or highly promising case studies, the dominant research directions towards Policy Making 2.0 can be recognized, reported and possibly even strengthened. Such a type of analysis has not been performed in the past, leading to non-evidence based research directions and to uncoordinated research efforts, while stakeholders see various elements that can fit under the Policy Making 2.0 umbrella as disjoint members that might belong in other domains.

This chapter presents an analysis and discussion of these issues and provides a set of practical and research recommendations addressed to all stakeholders of the domain. To this end, the remainder of the chapter is structured as follows:

Section 2 presents a quick overview of the landscape of Policy Making 2.0.

Section 3 presents the methodology through which candidate cases were collected, prioritized and the most suitable and outstanding ones were analysed in depth.

Section 4 provides a brief presentation of the selected cases, and the findings from the cross-analysis conducted.

Section 5 outlines the principles of what we have called the Decalogue of Policy Making 2.0, that is a set of practical recommendations suggested for designing and implementing interventions in the domain of Policy Making 2.0. It is complemented by recommendations for future research.

Section 6 presents some concluding remarks.

10.2 A Changing Landscape for Policy Making

The public sector collects, produces, reproduces and disseminates a wide range of information in many areas of activity, such as social, economic, geographical, weather, tourist, business, patent and educational information, commonly known as Public Sector Information (PSI) (European Commission 2003). In recent years, open data initiatives providing public sector information in "free-as-in-speech" manner for public, private and non-profit/civic consumption have flourished at an international and pan-European level. Numerous web and mobile applications exploiting open data have emerged leading to the characterization of open data as an effective engine of economic growth, social wellbeing, political accountability and public service improvement (Cabinet Office 2012). It is now well accepted that such open data also serve as a significant key ingredient in the policy making process for understanding the existing situation and feeding policy models.

However, the open challenge is how to elicit such information from open data initiatives and social media in real-time and based on reliable visual analytics and sentiment analysis techniques. During the overall model construction and use, legitimate open and social data (as two sides of the same coin (CROSSOVER 2012a) will assist decision makers and citizens to learn how a certain system works and ultimately gain insights (knowledge) and understanding (apply the extracted knowledge from those processes) in order to successfully implement a desired policy.

It is indicative that during the last years, the European Commission has decided to invest heavily in research on these areas, mainly through the FP7[1] Objective "ICT for Governance and Policy Modelling". One of the flagship projects for shaping the future research directions was CROSSROAD[2], which after following an open, crowd-sourced based iterative and technology-focused approach, bundled the open research questions in ICT for Governance and Policy Modelling for the years to come into four (4) Grand Challenges: (a) Model-based collaborative governance, (b) Data-powered collective intelligence and action, (c) Government Service Utility and (d) Scientific base of ICT-enabled governance. A follow-up project in the same direction was CROSSOVER[3], which advanced the results of the CROSSROAD project, adopting a demand-driven approach and rather than focusing on the technology, as it started from the needs and the activities of policy-making and then linked the research challenges to them, while additional emphasis was placed on cases and applications for each research challenge. CROSSOVER concluded with the proposition of two major Research Challenges, namely RC-1 "Policy Modelling", and RC-2 "Data-powered Collaborative Governance".

The work presented in this chapter has been based on the results of a study commissioned by the European Commission's Joint Research Centre, Institute for Prospective Technological Studies, as part of the CROSSOVER project, for collecting

[1] http://cordis.europa.eu/fp7/home_en.html.

[2] http://is.jrc.ec.europa.eu/pages/EAP/CROSSROAD.html.

[3] http://www.crossover-project.eu/.

and analysing a representative set of case studies in Policy Making 2.0, and distilled them into solid proposals for future research directions and policy recommendations for the Policy Making 2.0 domain.

10.3 Methodological Approach

In order to reach the results and implications that are presented in this chapter, a pragmatic and coherent methodology was designed and applied for safeguarding the transparency, openness and proper documentation of the whole exercise. In these terms, the methodology chosen consisted of the following seven (7) discrete steps:

1. Identification of a large number of sources for relevant cases/initiatives, through an extensive desk research and peer-to-peer brainstorming
2. Formulation and enrichment of an initial extensive, yet not exhaustive, list of candidate cases (more than 300 entries, deriving from almost every continent and applied in various policy domains).
3. Design and implementation of a suitable Cases' Description Template, in order to capture all the necessary information regarding each case in an effective and efficient manner.
4. Definition and application of a set of "1st Round Criteria" in order to filter the initial set of candidate cases and limit their number to 25.
5. Description of the 25 selected cases, followed by the selection and further analysis of a limited set of the 10 most relevant cases, identified through a second set of criteria.
6. Definition and application of a third set of selection and prioritization criteria, in order to identify the four (4) most suitable and promising cases.
7. Extensive description of and elaboration on the four selected cases (through extensive desk research, interviews with members of each one of the four selected cases, interviews with actual users, etc.), in order to derive valuable feedback, policy implications and recommendations.

For each of the selection steps mentioned above, different criteria were used in order to filter out cases that did not seem promising or showed a low impact. The final set of criteria was constructed in an effort to identify the four outstanding cases which needed to be quite broad, but complementary to each other in order to cover various dimensions of the domain. In this context, the criteria selected tested whether the cases correspond to the Research Grand Challenges identified in the above mentioned roadmaps, whether they altogether covered the Local, Regional and International dimensions, whether they targeted different application areas than the others (e.g. Environment, Finance, Labour, Youth, etc.), etc. The final four cases selected are briefly described in the next section.

10.4 Presentation and Cross Analysis of the selected cases

2050 Pathways Analysis

2050 Pathways[4] is a platform built by the UK Department of Energy and Climate Change (DECC) to help policy makers, the energy industry and the public understand policy choices regarding alternative energy consumption options. For each sector of the economy, four alternative trajectories have been developed, ranging from little or no effort to reduce emissions or save energy (level 1) to extremely ambitious changes that push towards the physical or technical limits of what can be achieved (level 4).

GLEAM

GLEAM[5], the global epidemic and mobility model, is a discrete stochastic epidemic computational model based on a meta-population approach in which the world is defined in geographical census areas connected in a network of interactions by human travel fluxes corresponding to transportation infrastructures and mobility patterns. The GLEAM 2.0 simulation engine includes a multi-scale mobility model integrating different layers of transportation networks ranging from the long range airline connections to the short range daily commuting pattern. Real-world data on population and mobility networks are used and integrate those in structured spatial epidemic models to generate data driven simulations of the worldwide spread of infectious diseases. GLEAM moved beyond research in the H1N1 epidemic case; the forecast derived from the application of GLEAM was considered particularly accurate and successful, compared to any previous effort.

Opinion Space

Opinion Space 3.0[6], launched by the U.S. Department of State, bridges the worlds of politics and social media in an interactive visualization forum, where users can engage in open dialog on foreign affairs and global policies. It invites users to share their perspectives and ideas in an innovative visual "opinion map" that will illustrate which ideas result in the most discussions and which ideas are judged most insightful by the community of participants. Using an experimental gaming model, Opinion Space incorporates techniques from deliberative polling, collaborative filtering, and multidimensional visualization. The result is a self-organizing system

[4] https://www.gov.uk/2050-pathways-analysis.

[5] http://www.gleamviz.org.

[6] http://www.state.gov/opinionspace/.

that uses an intuitive graphical "map" that displays patterns, trends, and insights as they emerge and employs the wisdom of crowds to identify and highlight the most insightful ideas.

UrbanSim

UrbanSim[7] is a software-based demographic and development modelling tool for integrated planning and analysis of urban development, incorporating the interactions between land use, transportation, environment, economy and public policy with demographic information. It simulates in a 3D environment the choices of individual households, businesses, and parcel landowners and developers, interacting in urban real estate markets and connected by a multi-modal transportation system. The 3D output of the aforementioned process is presented using indicators, which are variables that convey information on significant aspects of the simulation results. UrbanSim differs from these approaches by drawing together choice theory, a simulation of real estate markets, and statistical methods in order to achieve accurate estimation of the necessary model parameters (such as land policies, infrastructure choices, etc.) in order to calibrate uncertainty in its system. UrbanSim has proved its acceptance by the targeted end users as it has been already applied in many cases (mostly in the US), including Eugene-Springfield—Oregon, Detroit—Michigan, Salt Lake City—Utah, San Francisco—California and Seattle—Washington. In Europe, applications of the UrbanSim system include Paris, Brussels, Belgium and Zurich.

Cross Analysis of the Case Studies

The four cases identified have been investigated in depth and a cross-analysis took place to compare findings and distil key recommendations towards policy makers who embark on a "Policy Making 2.0" case.

Emerging from the need to solve real problems, all cases have been initiated either by governments or as a result of collaboration between researchers and governments, in a top-down approach. In particular, GLEAM and Opinion Space 3.0 were initially introduced as research initiatives that gathered significant attention and subsequent funding from public authorities. In fact, all cases build on a wide range of research techniques and exemplify how research can be applied in real-life settings.

Multi-disciplinarity in the teams behind all cases has brought together different perspectives and ensured appropriate modelling of policy options and interpretation of outcomes. Building a dynamic dialogue with the policy makers and all external stakeholders (from NGOs, academia, industry, experts) has provided significant in-

[7] http://www.urbansim.org.

sights and feedback to all cases. The real support by public officials has been though instrumental in the success of all cases.

To address the targeted needs of policy makers and citizens and to allow them to contribute in a more efficient and productive way to the policy issue at stake, dedicated tools have been developed. Simple interfaces (like gaming environments in the 2050 Pathways Analysis, or interactive visualizations in GLEAM, Opinion Space 3.0, and UrbanSim) have proved effective in engaging and keeping the interest of people with not a specific case-related background (such as in simulation, modelling, etc.) and have been strongly endorsed in practically all cases. Through the visual interfaces, users are in a position to create their own models and investigate specific issues that they are interested in. Naturally, in each case, the required learning curve to understand and use a policy model significantly varies (and is depending on the complexity of the policy model(s) running in the background for policy makers).

In all cases, the power of high-quality data at an appropriate level and format to be incorporated into policy models is indisputable. Open data have been exploited to an extent in the case of 2050 Pathways Analysis and GLEAM. In Opinion Space 3.0, the necessary data are in effect provided by the users and policy makers. UrbanSim on its behalf and GLEAM up to a degree take stock of proprietary data that had acquisition cost and limits on distribution.

Despite recognizing the network effect of social media and Web2.0 technologies, the four cases confirm that their use for the policy-making domain is often accompanied by some scepticism or too much enthusiasm. Interaction with social media is limited to publishing relevant stories in the user's social media accounts while a more efficient exploitation of social data is envisaged as a future research challenge in most cases studied.

Funding has also been a non-negligible factor for keeping the cases live as various additional functionalities and components have been gradually introduced in the course of each case's life span.

All cases have succeeded in informing policy makers in a documented manner. The use of policy models seems rather diverse, focusing at different abstraction levels and ranging from elaborate stochastic models (in GLEAM and UrbanSim) to more lightweight models (that can be depicted in excel spread sheets like in 2050 Pathways Analysis). As anticipated, behind each model, there are assumptions, modelling compromises, incomplete/missing data, etc. so looking at solely the numbers is not sufficient. The role of policy makers and field-experts (acting e.g. as consultants) indeed remains crucial across the policy making procedure.

To measure impact, typically, no specific KPIs were set from the inception of the cases. However, the numbers of visitors and of interactions have demonstrated their success and impact that has been reinforced with the help of appropriate stakeholders' engagement strategies that have been put in place. It needs to be noted that in some cases (GLEAM) users resorted to the corresponding platform as a result of a natural phenomenon (i.e. H1N1 pandemic) whereas in others (Opinion Space 3.0 and 2050 Pathways Analysis), it was the outcome of large press coverage.

By studying cases that had strong internalization aspects (i.e. transferring experience from national to international level in 2050 Pathways Analysis, from US to EU

in UrbanSim), the different culture dimension emerges and should not be neglected as it may decide the success of a case in different geographic settings.

As end users and stakeholders testify, in order for these cases to become popular and to be actively used, the teams working behind the tools have organised a high number of workshops, surveys and other demonstrations and dissemination events have been carried out. In addition, on-going research and applied collaborations with public administrations, research institutes and other types of organisations evince the usefulness and existing impact of the selected cases and have helped the teams to further innovate on their initial idea and elaborate on how to provide a continuously improving product/service.

In these lines, it has been also reported that all of the four cases consider further dissemination of their concept, tools and results; social channels/media should play an active role towards this direction, while visualization of findings/results is considered as key in the quest to attract end users, as it has the potential to turn complex issues to digestible and comprehensible results.

10.5 Discussion and Recommendations

The analysis of case studies conducted in the period between September 2012 and February 2013, provided the authors with a comprehensive and detailed view of the Policy Making 2.0 domain. It has also to be noted that Policy Making 2.0-oriented initiatives are not something that has come up only in the last few years; many of the recognized cases (including UrbanSim that is amongst the selected four and can be definitely considered innovative still today) have their origins about 15 years ago, or even more.

As the extensive desk research and the interviews proved, achieving an actually large number of end-users is more challenging than initially thought almost in every case. New technologies (e.g. simulation and visualization technologies) constitute a catalyst towards more end-user friendly interfaces; nevertheless, targeted effort has to take place in order both to attract and sustain end-users.

This and other insights that have been gained in the course of the analysis underpinning the chapter are summarised in the form of practical recommendations for policy makers and other stakeholders as the ‘Decalogue of Policy Making 2.0’, which is further complemented by a set of high-level research recommendations.

The Decalogue of Policy Making 2.0

On the basis of the experience of the four cases as studied and elaborated by the authors and as reflected in the interaction with stakeholders, a set of policy implications has been derived. Such implications have been formulated into the following concrete recommendations (“the Decalogue of Policy Making 2.0”) that should be taken into account by policy makers and stakeholders when initiating similar endeavours.

This set of recommendations is addressed towards not only policy makers, but also modellers, practitioners, researchers and Policy Making 2.0 case development teams, which should all work together in a collaborative manner towards delivering effective and added value applications and methodologies to advance policy making. With this audience in mind, the study presents in the following paragraphs the complete set of recommendations characterized as the "Decalogue" as it aims at infusing a very practical and applicable philosophy to all stakeholders. It is crucial for all of them to understand and acknowledge all recommendations for a complete case, even if some of them refer to specific actors and not to the overall set of stakeholders. Such a mutual understanding will allow more fruitful collaborations in the future and more result-oriented activities, where both parties will be able to comprehend the requirements and the work carried out by each set of actors.

As such, the recommendations that are presented below are also classified:

- Based on the stakeholder groups they refer to, which are:
  - Policy Makers
  - Modellers
  - Researchers
- Based on their scope regarding the overall case development that can be divided in the following phases
  - Business Model and Strategy definition of the case
  - Implementation and Technology Aspects
  - Engagement of Stakeholders

The practical recommendations identified, which represent the proposed Decalogue of Policy Making 2.0 are depicted in the Fig. 10.1 below, classified per stakeholders involved and scope of intervention.

1. *Build your case in Policy Making 2.0 in an agile manner*

Capitalizing on the experiences gained in the Web 2.0 era, cases in Policy Making 2.0 should follow the agile pattern implementing light-applications with constant, iterative cycles of design, development and testing. Since building a generic model to cover all aspects is impossible and specialization in certain domains and application of already established knowledge is the most recommended way to go, platforms/apps and their accompanying policy models should be gradually developed incorporating feedback received in each major and minor release.

2. *Continuously embed high-quality (open) data into your policy models*

No matter how well-defined or detailed a policy model is, high-quality data represent the holy grail of policy making. Particular attention thus needs to be given to collect, filter, curate and intelligently tap bottom-up data, available from multiple sources, i.e. through open data initiatives, social media and participatory sensing tools. As current policy making cases typically struggle to cope with too much or too little data, reliable data sources need to be foreseen from the very beginning and incorporated in policy models in a real-time manner to allow for pragmatically informed decisions.

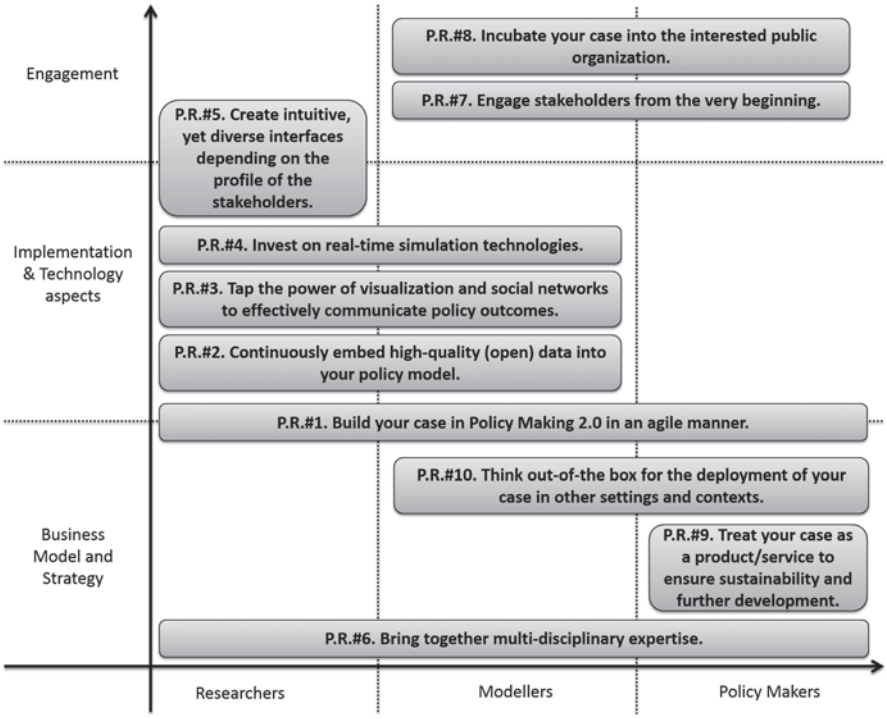

Fig. 10.1 The decalogue of policy making 2.0

3. *Tap the power of visualization and social networks to effectively communicate policy outcomes*

Policy models typically hinder such a high level of complexity that tends to discourage stakeholders from trying to understand the policy issue at stake. In essence, visualization holds the promise of providing valuable insights to non-specialists while social networks provide an unprecedented opportunity for spreading knowledge. By taking the best of breed out of both research streams, a case is by-design more tuned to solicit concrete inputs from its stakeholders.

Stakeholders Addressed: Researchers, Modellers

Scope of Recommendation: Implementation & Technology Aspects

4. *Invest on real-time simulation technologies*

In a rapidly moving world, the importance of real-time data and simulation for quick decisions gains more and more momentum. To this end, it is necessary for a case not only to gather real-time data, but to allow for the direct experimentation with the policy models to anticipate the outcomes of various policy alternatives. Only through advanced simulation capabilities, different models can be calibrated at a satisfactory degree and eventually converge to best policy options.

5. *Create intuitive, yet diverse interfaces depending on the profile of the stakeholders*

Policy models by their nature depict part of the reality as conceived by policy makers and interpreted by policy modellers. In order to bridge the gap of modelling literacy, though, all stakeholders irrespectively of their background need to understand the effect of their own actions on the models. Finding the balance between complexity which is required for the policy making purposes and simplicity to ensure high engagement is always a challenging task. To this direction, intuitive interfaces (which are also accessible from multiple devices and platforms) in order to engage a wide range of stakeholders (policy modellers, policy makers and citizens) seem a crucial success factor.

6. *Bring together multi-disciplinary expertise*

The need for multi-disciplinary approaches in policy making has been long debated during the last years. With policy challenges that are both global in nature and local in required action, it is more necessary that ever to bring in a wide range of expertise that will not only construct a solid and close to reality model, but also interpret the results correctly and catch the realm of citizens. It needs to be noted that such expertise should emerge from research, practitioners, policy makers, NGOs and other stakeholders who are motivated to be heavily involved. Significant added value is attached to a case in Policy Making 2.0 by establishing a balance between research activities and real-life applications to constantly improve the actual impact of the ICT tools.

7. *Engage stakeholders from the very beginning*

In order to consider a case in Policy Making 2.0 as successful, a wide range of innumerable stakeholders needs to be involved at various engagement levels: from active, everyday participation to merely briefing. Opening up dialogue with all stakeholders is a time consuming task that should not be underestimated. To this end, an engagement strategy with targeted activities for each stakeholder group needs to be outlined and put into effect from the very beginning, although it might seem difficult when dealing with pure research concepts. Successful cases get known one way or another via word of mouth/Web2.0 and satisfied users are the best ambassadors of a case.

8. *Incubate your case into the interested public organization*

Typically, research is conducted in kind of “sterilized” laboratory environments with little interaction with the end-users. In the case of Policy Making 2.0, research needs to go hand-in-hand with practice in order to allow for quick implementation of ideas in real-life settings. Along these lines, research teams should incubate in public organizations with a policy agenda in order to ensure smooth communication and seamless advancement of research through its direct application.

Such an approach will also help to research teams to validate their assumptions based on real-life data and policy makers will be able to propose requirements, as captured during operation, which will help to further optimize the offered solutions.

Public organisations should thus build specialized teams within their structure that will consist of not only policy experts but also from researchers that have developed the offered solutions in order to streamline the process of exploiting the full potential of the offered tools and for connecting practice with research.

9. *Treat your case as a product/service to ensure sustainability and further development*

Following the paradigm of enterprise software (i.e. ERP or CRM) and services, cases in Policy Making 2.0 should be viewed under a long-term perspective for their target audience and potential clients that are no others than policy makers. They should not represent a one-off effort that may become obsolete and deprecated, but rather represent the commitment of the corresponding public organization to keep the initiative live through periodic funding injections.

By treating a case as a service/product, the interest of the research and stakeholder community can be more effectively maintained, the underlying models can be further elaborated and optimized and the sustainability of the offered solution can be maintained in a more proper and effective manner. Of course, alternative sources of funding may be also discovered and utilized. At the bottom line, policy makers should realize that Policy Making 2.0 cases, in other ICT domain (such as Social Media), possess a ROI that cannot be measured and witnessed directly, however benefits do exist and they can only be sustained by the proper funding instruments.

10. *Think out-of-the box for the deployment of your case in other settings and contexts*

The team responsible for a case in Policy Making 2.0 should keep its horizons open and ensure its maximum outreach both within and beyond the organization for which it was originally developed. Interaction with stakeholders from different domains may pave new directions for the application of a case and cover diverse needs of policy makers that had not been originally foreseen. As such it is important to spread the knowledge and the overall experience of a case with as many stakeholders as possible in order to trigger their eagerness and explore new horizons that may lie ahead.

Research Recommendations

Based on the analysis performed and briefly presented in this chapter the authors also came up with a short list of high-level recommendations that could be used to engrave future roadmapping of research in the domain of Policy Making 2.0.

1. *Think of the composing Elements not as Individual Elements, but as Nodes in a Connected Graph*

Highly complex environments have a unique characteristic: the elements they include are related and linked to each other based on various types of relationships.

Such behaviour seems natural as Policy Making 2.0 is a domain that contains diverse research fields that should however be combined and tackled in parallel in order to deliver working and usable applications and methodologies that could support the everyday policy making procedures. This is also a need that derives directly from the fact that such applications target many different stakeholder groups, with diverse backgrounds and thus it is necessary to combine different parts of the identified research challenges.

2. *Build Clusters of Research Challenges and Define Policy Making 2.0 "Enablers"*

Based on the findings of the four case studies and taking the CROSSOVER Roadmap as a reference point, it seems that research challenges "Collaborative Modelling", "Immersive Simulation", "Output Analysis and Knowledge Synthesis", "Open Government Data", "Big Data" and "Visual Analytics" are met more times than the rest. This could lead to the creation of different clusters around them, as they seem to be quite dominant and present in most cases.

Moreover, as also mentioned before, numerous links between the various research challenges of the two Grand Challenges exist. This reality should be considered alongside Research Recommendation #1 in order to construct clusters of research challenges that could lead to more applied research in order to move more quickly from purely theoretical investigation of issues to the development of real life applications and methodologies.

Policy Making 2.0 "Enablers" can be seen as bits of supportive technologies and methodologies that can be directly exported from neighbouring domains and could be used to support the creation of applications and Policy Making 2.0 tools. These include elements from domains such as Identity Management, Cloud Computing, Social Media, Mobile Technologies, Human Computer Interaction, etc. that are being thoroughly researched and have already delivered quite substantial results. In this context, Policy Making 2.0 should identify the best-of-breed solutions coming from these domains and directly introduce them to existing or under development cases in order to refrain from re-inventing the wheel, but focusing on the research topics and themes that are more relevant to the policy making cycle and to the decision procedures that need to be improved. To this extend the crosschecking of the existing research questions with a well-defined and structured taxonomy documenting the current knowledge of the domain and of the neighbouring ones should take place.

3. *Promote Shift from Gov Labs to Open Apps*

One of the fundamental characteristics of Policy Making 2.0 is the inclusion of citizens in the decision making process through their interaction with various tools. Of course, the direct inclusion of the complete society is not always possible (and in some cases also not desirable). Although many citizens poses skills that allow them to utilise the various tools and methods, most of them are complex enough to be used by the whole population targeted. This situation is quite evident today and up to a fact this is one of the main issues behind the lock-up situation of Policy Making 2.0 in a top-down approach, where a clearly bottom-up (crowdsourced based)

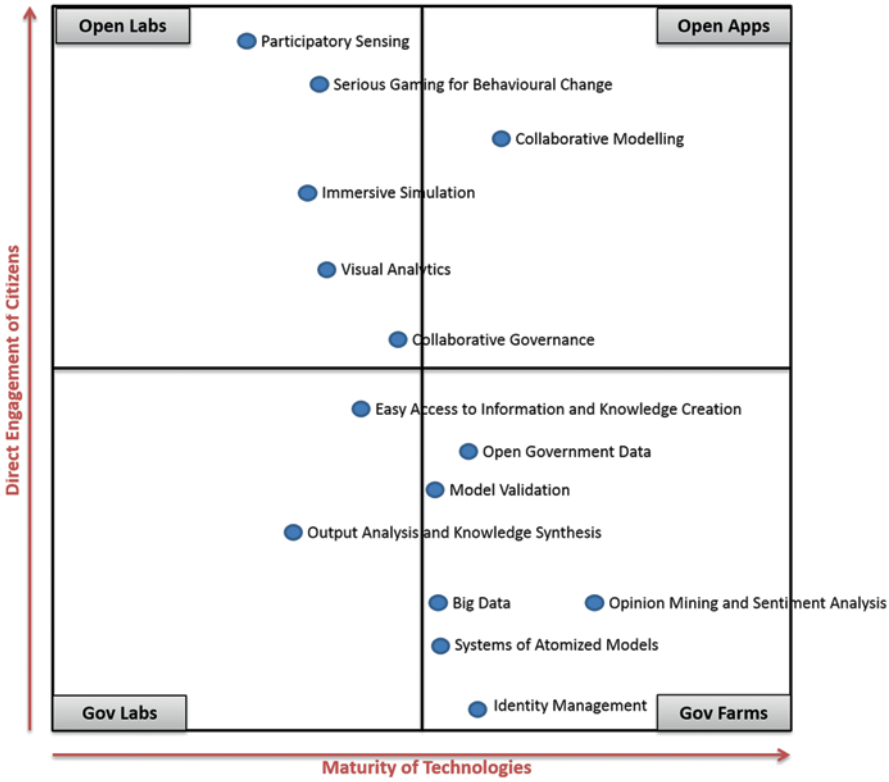

Fig. 10.2 Magic quadrant of research challenges

approach that is actively being exploited and used by high level policy makers, is severely lacking at the moment.

As the "magic quadrant" in Fig. 10.2 reveals, the current landscape could be divided in four spaces:

- "Gov Labs" where applications are still highly experimental and they are only addressed (or can be used) by policy experts,
- "Gov Farms" where again policy experts are the users but applications and tools are in a highly mature and operational state,
- "Open Labs" where direct engagement of citizens is quite high but applications are again experimental, and finally
- "Open Apps" where there exist at the same time high engagement of citizens and maturity of applications to be used for everyday purposes.

The purpose of this "magic quadrant" is to act as a "sample" of the current Policy Making 2.0 landscape, and therefore the placement of the research challenges represents the "median" value of the actual placement on this 2D area of the elements// tools/technologies/methodologies they include.

As this figure reveals, most of the research challenges that involve the direct engagement of citizens are still considered as quite immature, and this also argues for their lower utilisation and verifies their importance for the research roadmap. At the same time, the research challenges that at the moment do not engage citizens in a direct manner, are considered more mature, however they have just passed the infancy years and results of their utilisation and impact on the policy making process became evident only in the last few years.

In this context, although these are considered as more "ready-to-use", research is still required in order to put them on production platforms. The further research required will not only further improve them and integrate them in the everyday activities of policy makers, but will also enhance their social characteristics so that they will eventually engage citizens in a more direct way.

4. *Define the Timing Horizon for Research*

A final practical recommendation for future research roadmaps, which is generated as a consequence of the analysis of the four case studies and as indirect implication of the previous roadmap recommendations is that all research challenges should be clearly accompanied by a time horizon. Such a horizon shall focus research effort towards achieving measurable and quantifiable results in a given time frame.

Figure 10.3 presents a conceptual hype curve (or hype cycle) regarding the research challenges as identified in the latest roadmap on Policy Making 2.0 (CROSSOVER 2013). This hype curve is based on information that derives from:

- the current trends of the ICT (in general) and of the Policy Modelling domain
- the views that have been recorded during the interviews that took place during the study. This was possible as the interview people elaborated their thoughts on the future research activities regarding their case, the desirable improvements and the potential extensions in terms of utilisation and exploitation of emerging or existing technologies and methodologies over an horizon of the next upcoming 10 years.

By looking at the figure it should be considered that the placement of each research challenge on the curve has been performed having in mind both the mature and the immature sub-areas it contains. In general, the position of the different research challenges on the curve in Fig. 10.3 is in accordance with their maturity level as presented in Fig. 10.2.

As a result, an indicative timeframe for research can be drawn, grouping research challenges into those that are considered:

- more mature and could deliver concrete results in a short term horizon of no more than 3 years,
- on the verge of maturity and could produce results within 3 to 5 years of research and
- still in infancy and require more intense and long-lasting research efforts, putting their major concrete contribution to the domain of Policy Making 2.0 in a timeframe that lies 5 to 10 years ahead from today.

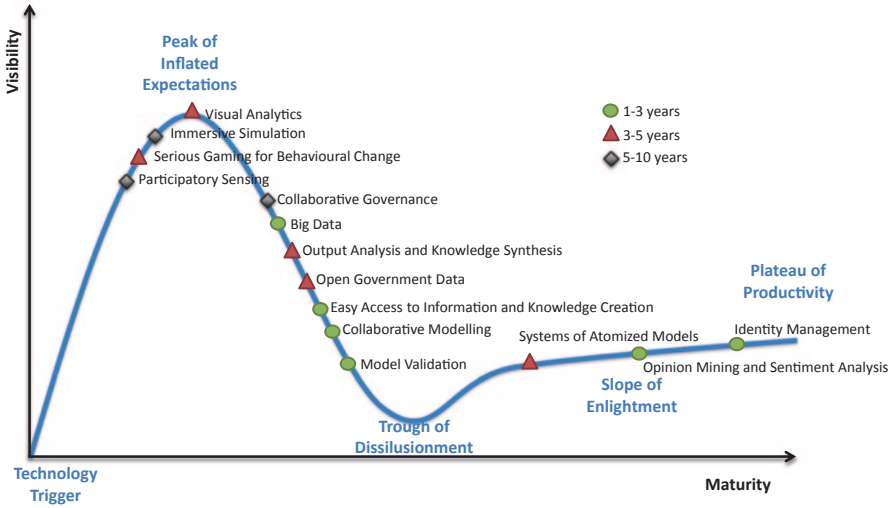

Fig. 10.3 Policy making 2.0 research challenges hype curve

Based on the previous recommendations, it has to be noted that the timeline presented in Fig. 10.3 is neither fixed, nor it represents the complete view of the domain. It is heavily based on the four investigated cases of the study and although they are considered representative enough for the Policy Making domain, opinions of experts in all these fields are necessary in order to adjust the placement of these research challenges on the hype curve.

Moreover, despite the fact that these cases are highly representative of the domain, further investigation of other cases and exploration of the links between the various research challenges is required in order to optimise the time horizon for future research. In addition, a cross analysis of these timelines, of the graph relationships of the research challenges and of their position regarding their maturity and engagement of citizens is required in order to derive to the final roadmap that will reveal well-coordinated mechanisms for exposing the potential of the domain in the most quick and efficient way.

10.6 Conclusions

All in all, the recommendations suggested in this chapter are aligned with the character of the Policy Making 2.0 domain, which calls for more open, collaborative and evidence-based decisions. These needs are still not covered, as the analysis conducted reveals that many of these prerequisites are still missing even after so many years of research. Seamless access to information and data, preferably following an open and not costly approach are still missing, while agencies are over-protective and reluctant to the idea of sharing their data while at the same time other datasets

are too expensive to be used by research teams. At the same time, policy makers are still treating emerging cases as "freeware" products and are not investing in the further development of them, nor in the necessary personnel that possess the required background to turn the results of these tools to digestible facts and figures for policy makers. Moreover, there is confusion about which tools are for citizens and which for policy makers, while almost all research efforts follow a top-down approach, neglecting the fact that open innovation and crowdsourcing is gaining a tremendous momentum in the Web2.0 era.

This study ends up with two sets of recommendations addressed both to policy makers and to practitioners/researchers of the Policy Making 2.0 domain. The first set of recommendations, which has been generated by analysing and identifying these issues, deals with the presentation of policy implications as captured by the analysis and the interviews conducted with people involved in the various cases identified.

Despite the impact and the benefits for both researchers and policy makers that future research will bring, it is inarguable that relevant communities are "not yet there" when it comes to fully exploiting the benefits of ICT for governance and policy-making and interweaving ICT within the policy domain. In fact, one of the main reasons and needs behind designing relevant research roadmaps is to deal with this reality. It is difficult to deny that there is an urgent need for better policy-making to drive Europe out of its current crisis contributing towards the achievement of the objectives of the Europe 2020 strategy; at the same time there is still a considerable gap between the potential and the real impact of ICT tools in support of governance and policy-making.

An initiative from various policy-related organisations and/or entities to agree on and formulate an integrated roadmap based on the recommendations presented in the document at hand would be consider of high added value by the authors. Effective and efficient collaboration amongst all stakeholders (e.g. governmental organisations, regional administrations, NGOs, researchers, developers, social scientists), based on the lessons learnt for successful and unsuccessful initiatives of the past, could lead to highly useful and substantial initiatives on Policy Making.

In this respect, the phenomenon defined as Policy Making 2.0 is clearly only at the beginning. The Decalogue of Policy Making 2.0 presented in this chapter is a starting set of practical recommendations that should be taken into consideration in order to address complex problems and societal challenges through the use and with the support of ICT. This should allow the 'next' generations of policy makers to rely on better evidence for policy design, tapping also on the staggering amount of interactive simulations and visualizations capabilities that emerging ICT allows. This should add to the legitimacy of the decisions taken by policy makers at all governance levels, while enabling citizens to understand, participate and even change their behaviour.

Disclaimer The views expressed in this paper are purely those of the authors and may not in any circumstances be regarded as stating an official position of the European Commission.

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Chapter 11
A Community-driven Open Data Lifecycle Model Based on Literature and Practice

Anne Fleur van Veenstra and Tijs van den Broek

Abstract Government organizations around the world have developed open data strategies to increase transparency and enable re-use of their data. However, in practice, many organizations find the process of opening up their data cumbersome and they do not know which steps to take. Lifecycle models can guide the process of opening up data. Therefore, this paper develops an open data lifecycle model based on literature and practice. First, using existing open data lifecycle models this paper identifies generic phases of opening up data. Then, investigating the process of opening up data in a semi-public organization in the Netherlands, the lifecycle model is refined. While existing open data lifecycle models focus mainly on technical aspects of opening up data to ensure publication, our case study shows that involving stakeholders within the organization as well as building an engaged community of stakeholders outside the organization—also in an early stage, is crucial to the success of open data. This stimulates re-use and allows for open data to be embedded into the organizational strategy and work processes.

11.1 Introduction

Open data gained momentum since President Obama of the United States announced his 'open government' strategy (McDermott 2010). Since then, governments around the world have adopted 'openness as a strategy' for their organizations to become more transparent and thereby accountable to citizens (Jaeger and Bertot 2010). Furthermore, open data is increasingly seen as a strategy to realize economic activity (Harrison et al. 2012) by enabling re-use of data. By now, also semi-public organizations, such as cultural heritage foundations, public transport organizations, network operators and research institutes, have adopted open data

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strategies. For these organizations the purpose of opening up their data extends beyond increasing transparency and increasing the economic value of data through re-use by others. They are also looking for ways to enhance the value of their data for their own (commercial) purpose.

One way in which organizations are able to achieve this, is by using data in such a way that it makes their internal processes more efficient or effective. Another possibility is by developing additional services or visualizations with their data. However, organizations often find the process of opening up data cumbersome (Janssen et al. 2012). They are unaware which steps to take in the process of opening up data. Lifecycle models are used to guide the development of open data (examples include Alani et al. (2007); Curtin (2010); Hausenblas (2011); Hyland and Wood (2011); Janssen and Zuiderwijk (2012)). However, few of these models have been developed based on empirical investigations. Therefore, this paper develops an open data lifecycle model that is based on literature and practice.

The development of this open data lifecycle model takes place in two steps. First, existing open data models are compared to identify generic phases that organizations opening up data go through. Then, based on a case study of a research and technology organization (RTO) in the Netherlands the model is validated and detailed, including the specific activities and roles to adopt in every phase. The next section presents existing lifecycle models and compares them, formulating five generic phases that all organizations go through to open up their data. The third section describes the case study of an RTO in the Netherlands. The fourth section presents the main findings from the case study by formulating the refined open data lifecycle model. Section five discusses these findings and, finally, section six formulates conclusions and recommendations for further research.

11.2 Lifecycle Models of Open Data

While many government organizations aim to open up their data, the process of opening up data is usually cumbersome and many challenges persist (see, for instance, Janssen et al. 2012). One way of capturing challenges and addressing them in a structured manner is by formulating a lifecycle model. A lifecycle is an examination of a system or proposed system that addresses all phases of its existence (Blanchard and Fabrycky 2006). Often lifecycle models are associated with the development of tangible products, services or assets, such as software development (Stallinger et al. 2011). In that context, a lifecycle model defines the processes that apply to software throughout its lifecycle. Alongside these processes, it also defines activities, tasks and outcomes for every phase of the lifecycle and serves as a common body of language.

The purpose of lifecycle models is twofold: they capture the development of certain phenomena (describing) and predict the next steps in the development (prescribing) (Lane and Richardson 2011). In e-government, lifecycle models help researchers to describe the process to an e-government initiative, instead of the outcome (see, for example, Tsai et al. (2009)). In contrast to maturity models (see, for example,

Kalampokis et al. (2011) for an open data maturity model), lifecycle models do not prescribe organizational stages of the software development process. Still, the process steps of developing information systems differ among situations. Hence, normative lifecycle models are often criticized as non-situational (White Baker 2010).

Also in literature on open data, a variety of lifecycle models can be found describing the process of opening up data and guiding organizations through this process. Based on an extensive literature search, we found eight open data lifecycle models: Alani et al. (2007); Curtin (2010); Ferrara et al. (2012); Hausenblas (2011); Hyland (2010); Hyland and Wood (2011); Villazón-Terrazas et al. (2011); Janssen and Zuiderwijk (2012). The number of lifecycle models urges for comparison and synthesis (Ruparelia 2010). Therefore, this paper compares existing models of open data in order to develop a lifecycle model that includes all relevant dimensions of open data and that can be validated in practice. Table 11.1 identifies the phases and activities in the lifecycle models that were found in literature. The column on the right lists the subsequent steps formulated in these models. Then, shown in the middle column of Table 11.1, we formulated common actions identified based on these existing models. Finally, we identified five common phases of opening up data: identification, preparation, publication, re-use and evaluation. These are shown in the left-most column of Table 11.1.

11.3 Case Study

Case Study Methodology

To investigate the process of opening up data we use an interpretivist methodology for in-depth research of a single organizational case study, fitting its complexity (e.g. Klein and Myers 1999). Interpretivist research is "aimed at producing an understanding of the context of the information system, and the process whereby the information system influences and is influenced by the context" (Walsham 1993, p. 4). In the previous section, the different phases of the lifecycle model and the steps to be undertaken in these phases were identified. Using a longitudinal case study approach we aim to validate and refine the subsequent phases of the lifecycle model. The case selected is TNO (www.tno.nl), the national RTO of the Netherlands. This case was selected as the organization is in the middle of opening up its data to the public. This means that data could be collected during the implementation of the open data strategy.

For analysing the case study we use a triangulation of methods (Mingers 2001), including action research and semi-structured interviews. This combination of methods aimed to capture the variety of the actions that were undertaken, and at the same time the involvement and attitude of stakeholders and evaluate the actions. The stakeholders were sampled based on their involvement in the process of opening up data as well as on their role in the organization. The action research consisted of the research team keeping track of actions that were undertaken throughout the process of opening up data, which started in September 2012 and continued until February 2013.

Table 11.1 Open data lifecycle phases and the actions that are undertaken in every phase

Lifecycle phase	Steps per phase	Activities in literature
Identification	Setting the strategy	Setting aims of open data (Alani et al. 2007)
		Data awareness (Hausenblas 2011)
		Deciding on making data available (Janssen and Zuiderwijk 2012)
	Selecting the data	Collecting databases (Alani et al. 2007)
		Approving the open datasets (Curtin 2010)
		Supporting the data selection (Ferrara et al. 2012)
		Finding data for potential re-use (Hyland 2010)
		Obtaining a copy of the models of the databases (Hyland and Wood 2011)
		Obtaining data extracts or create replicable data (Hyland and Wood 2011)
		Identifying real life objects in data (Hyland and Wood 2011)
		Identifying data (Janssen and Zuiderwijk 2012)
Preparation	Setting requirements	Analysing requirements (Alani et al. 2007)
	Modelling and describing data	Describing data and give it context (Hyland 2010; Hyland and Wood 2011)
		Specifying, defining and analysing the data (Villazón-Terrazas et al. 2011)
		Design and build an ontology for the data (Alani et al. 2007; Ferrara et al. 2012; Hausenblas 2011; Hyland and Wood 2011; Villazón-Terrazas et al. 2011)
		Defining a schema pattern for the Unique Resource Identifier (Ferrara et al. 2012; Hyland 2010; Hyland and Wood 2011)
		Planning for persistence of data, e.g., Persistent Uniform Resource Locators (Hyland 2010)
	Converting to machine-readable data format	Generating the data (Villazón-Terrazas et al. 2011)
		Convert the data to machine-readable format (Alani et al. 2007; Ferrara et al. 2012; Hyland and Wood 2011; Villazón-Terrazas et al. 2011)
		Cleaning the data (Villazón-Terrazas et al. 2011)
	Linking data	Mapping the data and ontology to existing ontologies and database (Alani et al. 2007)
		Linking data to existing data (Villazón-Terrazas et al. 2011)
	Storing data	Storing data in a datastore (Ferrara et al. 2012)
Publication	Publication of data	Publishing data (Curtin 2010; Hausenblas 2011; Hyland 2010; Hyland and Wood 2011; Janssen and Zuiderwijk 2012; Villazón-Terrazas et al. 2011)
	Publication of metadata	Attaching data provenance for tracking (Curtin 2010)
		Publishing metadata (Villazón-Terrazas et al. 2011)
Re-use	Exploiting of published data	Creating an online data catalogue of published data for data discovery (Hausenblas 2011; Hyland 2010; Janssen and Zuiderwijk 2012; Villazón-terrazas et al. 2011)
		Managing access rights to the dataset (Ferrara et al. 2012)
		Exploiting the data (Villazón-Terrazas et al. 2011)

Table 11.1 (continued)

Lifecycle phase	Steps per phase	Activities in literature
	Data management	Maintaining of data (Hyland and Wood 2011) Processing and visualizing the data (Janssen and Zuiderwijk 2012) Discussing the quality and relevance of the data (Janssen and Zuiderwijk 2012) Recommending existing and future data (Janssen and Zuiderwijk 2012)
Evaluation	Developing business propositions	Developing use cases of data (Hausenblas 2011)
	Monitoring and improving data	Monitoring data re-use (Janssen and Zuiderwijk 2012) Integrating and improving data (Hausenblas 2011; Janssen and Zuiderwijk 2012)

Subsequently, we validated these findings by conducting eight semi-structured interviews. These interviews were held with five data owners, a director or research, a strategist and an information manager who were all invited to reflect on the process of opening up data and on their role in this process. The interviews were held in November 2012 and January 2013 and lasted 45 min on average. Table 11.2 provides an overview of the interviewees. Central questions concerned the strategic choices for opening up data of the RTO, their experiences with opening up data, the actions that were undertaken and their significance, as well as the involvement of significant stakeholders. Based on the findings, the steps to be taken during the process of opening up data were identified.

Opening up Data in an RTO

TNO is the national RTO of the Netherlands and can thus be considered a semi-public organization. The organization has long opened up some of its research data to the public; for some time, the organization even was the largest contributor of datasets to the national open data portal data.overheid.nl. However, opening up data was not undertaken in a structural manner but only took place incidentally. The decision of Ministry of the Interior to build an open data portal, also spurred the attention for open data within the RTO that began to realize that it may have a responsibility to open up its data. Therefore, a first meeting was organized, bringing together those stakeholders in the organization that have an interest in opening up their data.

During this meeting the purpose of opening up data by the RTO was identified to consist of three reasons. Firstly, opening up data is seen as a necessity for transparency, for example to show how research data are gathered and how they are structured. Secondly, the data of the RTO can be re-used by others to develop new services and stimulate economic development. This is especially relevant as many research projects of the RTO are funded by the government and these data

Table 11.2 Overview of the interviewees and their functions

Function	Role in the open data process
Director of research	Top management
Strategic advisor	Top management
Information manager	Information manager
Senior research scientist 'Employment data'	Data owner
Researcher/consultant 'Employment data'	Data owner
Software engineer 'Geological data'	Data owner
Senior research scientist 'Traffic data'	Data owner
Junior research scientist 'Traffic data'	Data owner

can be considered a public good. Thirdly, the RTO also has a commercial interest in open data. Therefore, the RTO is looking for ways to use their data to develop new commercial activities, for example by forging strategic partnerships with other data owning organizations.

To develop a structural way of opening up data, during the fall of 2012 the RTO undertook a pilot project in which a few datasets were opened up. During this pilot project multiple steps were undertaken. Firstly, suitable datasets that could be opened up were identified and the data owners of these datasets were invited to participate in this pilot. Two datasets were identified and subsequently prepared for opening up. Secondly, the datasets were opened up especially to take part in a *hackathon*, a one-day workshop in which 150 participants could use the data to develop their own services. The hackathon was organized by the municipality of Rotterdam in October 2012 and aimed to promote the commercial use of public data in an urban environment. Data owners provided and pitched their data to teams of voluntary programmers. Several prizes (ranging from €500–€3000) were granted to the winning teams to stimulate the development of apps in specific areas of re-use: healthcare, business, tourism and mobility. And thirdly, these activities were evaluated with the data owners and other stakeholders that were involved. Based on these activities, a refined open data lifecycle was developed capturing lessons learned.

11.4 A Community-driven Open Data Lifecycle Model

In order to open up its data, the RTO undertook the steps visualized in the refined open data lifecycle model (see Fig. 11.1). As will be discussed below, throughout the cycle the involvement of the community was found to become more and more important. This community-driven open data lifecycle model consists of five phases: identification, preparation, publication, re-use and evaluation, each consisting of two steps. Furthermore, during the process of opening up data, it was observed that five different stakeholders within the organization were to be involved to complete the step successfully. These five organizational stakeholders are top management,

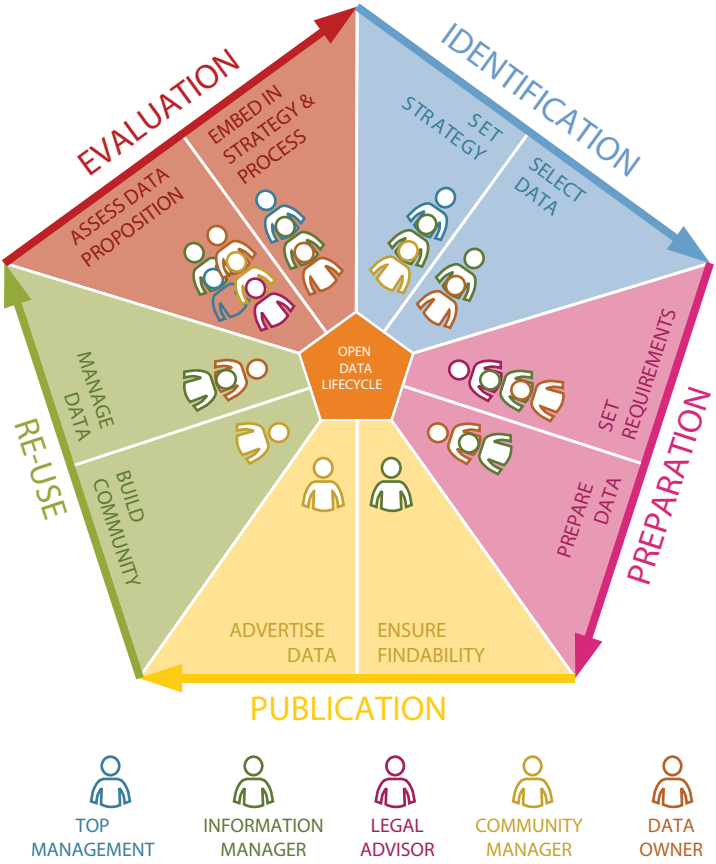

Fig. 11.1 A community-driven open data lifecycle model

information manager, legal advisor, community manager and data owner. The model and the lessons learnt in the RTO case study are elaborated step by step.

Identification

The first phase of opening up data encompassed defining the use of open data and identification of data that were to be opened up. In the case of the RTO, a meeting was organized in which all relevant organizational stakeholders participated. Furthermore, as the purpose of the pilot project was to open up data during a hackathon, contact was made with the hacking community to identify which data would be interesting for re-use. We found this phase to consist of two subsequent steps: strategy setting and identification of data for opening up.

Setting the Strategy

In the case of the RTO, the strategy setting step of the pilot project was limited. It consisted of top management deciding to undertake the pilot project to investigate how the process of opening up data takes place in practice. The roles that were involved in this step were the information manager and top management, as well as the community manager. The former two roles were necessary to define the scope of the project internally, while the latter role connected with potential users. Top management support was found to be of critical importance—even though it was only a pilot project. As there were no procedures yet that could be followed when opening up data, this support was necessary as it meant that risks could be mitigated. This was especially relevant as a result of the different types of interest the RTO has in relation to open data. The director: "Our role in the world of open data is quite interesting: we aim for transparency, but at the same time we have to make money. Open data may be even more challenging for us than for public organizations."

Selecting the Data

During the second step of the identification phase, the information manager and the data owners identified datasets to be opened up during the hackathon. To identify which data could be opened up, ePSI Platform (2013) guidelines were used. These state that datasets can only be opened up when they comply to regulations regarding ownership (including intellectual property), privacy and security. Using a longlist of available datasets that comply to the above-mentioned criteria, the most meaningful datasets were selected: the shortlist. In this pilot project, this meant that three datasets were selected from different domains: health, transport and geology. We found that in this step the support of the data owners was of great importance as they need to be willing to prepare the data. Not all data owners are familiar with open data yet, according to one of the data owners: "It would be useful to identify those data owners that have interesting data but are not yet aware of what open data is. They should be supported to open up their data."

Preparation

After the three datasets to be opened up for the hackathon were identified, the second phase of the project consisted of preparing the datasets for publication. We found that although the datasets that were identified were of high quality, it still required some work before they could be opened up. Except for the involvement of the legal advisor, who checks whether the data that are to be made public can indeed be opened up, the main work in this phase was carried out by the information manager and the data owners. This phase consisted of two steps: setting the requirements, and (technically) preparing the data.

Setting Requirements

In the first step of the preparation phase, the information manager and legal advisor formulated the requirements for the data to be opened up. These requirements include technical requirements (such as data quality level, standards and metadata), economic requirements (such as the value proposition and business model) and legal requirements (such as the license for re-use). Especially the issue of data quality was addressed as the data owners were concerned that data quality would not be high enough. At the same time they realized that the users (the participants in the hackathon) would probably not have the time to build a fully operational application based on the data. Therefore, it was decided that data quality would remain as it was. The data owners agreed that the desired data quality largely depends on the demands of users. For example, in the case of using real-time public transport data accuracy is of higher importance than when data of historic monuments are published. Still, a data owners wonders about who would be responsible for realizing re-use: "I am not sure whether it is the task of the data owner to think about this. The central characteristic of open data is that the community is in a better position to think about re-use than data owners."

Preparing the Data

The second step of the preparation phase was the technical preparation of the data. This was the responsibility of the information manager and the data owner (or the person that is made responsible by the data owner). During this step a number of issues were addressed. Firstly, ownership of the data needed to be clear, otherwise data cannot be published freely. Secondly, data that can be tracked to individuals cannot be published or the part of the data that can be linked to individuals needs to be anonymized. One of the data owners: "*We have had a discussion about privacy with the Dutch bureau of statistics (CBS), co-owner of the data. The Dutch data protection regulation is translated by CBS in rules on how to guarantee anonymity of the data, even when clever programmers work with the data.*" Thirdly, data is often captured in an unstructured way that fits its original purpose. Therefore, this step included modelling the concepts and links within the data, and labelling the data in a unique way according to an Unique Resource Identifier strategy (similar to a website URL strategy). Fourthly, to allow re-use, data is converted into a machine readable and open structured format, metadata is added, and the data is stored following a specified format (e.g. SPARQL endpoints). Finally, we found that as there are no common protocols for opening up data yet, this provided the information manager with a lot of freedom, but also with many uncertainties.

Publication

The third phase of publication co-incided in this case study with its re-use: the data was published during a hackathon and instantly used by programmers to develop applications. We found that two steps were taken during the publication phase: ensuring technical findability and advertising the data. We found these two steps to have different purposes. While many organizations focus on the technical findability of data, also engagement with the community of potential re-users and advertising the data was found necessary to ensure data re-use.

Ensuring Findability

During the first step of publishing data, the data needs to be registered in such a way that potential users can find what they need. Technically, this was done by registering the data and metadata in the data catalogue of the hackathon, similar to publishing data in a national open data portal. Registration was found essential: it allowed data users to diminish the costs of finding the correct data. This task was carried out by the information manager and the data owners. While in this case study publication of data took place in the confined environment of a hackathon, in a fully open environment this can be done, for example, in a national data portal. The data-owners stressed the importance of publishing documentation about the data: "There was no description of our data uploaded on the servers, which made the data more difficult to use".

Advertising the Data

While registration of the data in the most suitable portal and adding metadata may ensure findability, it may not be enough to actually ensure re-use. Ensuring proper advertisement of the data was the task of the community manager that communicated with potential users. During the hackathon the data owners presented the content of their data to potential re-users. Furthermore, the re-use conditions (license) were communicated to make sure that users understand them. Based on the reactions of the potential users we found this phase to be essential for realizing actual re-use. Merely publishing data is often not enough to show the potential. Still, it seems that many organizations forget this step and assume that opening up data as such is enough to ensure re-use. Data-owners need enough resources to advertise their data. One of the data-owners pointed out this problem: "The hackathon is an initiative that is not part of my daily job. So, the hackathon was a personal hobby rather than a carefully planned project."

Re-use

The fourth phase is the re-use of data. In the case study, however, we found that the data were not used during the hackathon—much to the dismay of the data owners. It seemed that the datasets that were opened did not respond to the wishes and interests of the teams of programmers. They stated that the data that the RTO opened up was often very complex and they could not easily grasp its potential during the one-day hackathon. Furthermore, there were many other datasets brought in during the hackathon. This meant that especially the step of advertising the data was essential to make sure that data would be used. What initially seemed to be a simple activity within the relative confined environment of a hackathon, thereby became a serious bottleneck in the process of opening up data. Having a community manager to guide the data owners through this step in the process was found to be essential to achieve re-use.

Building a Community

This step was not actively undertaken during the process of opening up data of the RTO and its absence was felt as data were not used during the hackathon. The data owners found during the day that fostering re-use by building a community around the data that is opened up may be necessary to enable use. They said that besides advertising the availability of data the community manager could have actively sought to collaborate with external stakeholders that may want to use the data. This could have happened in earlier phases of the process. Active community building and involving external stakeholders already in the beginning of the process may not only enable re-use, but may also spur the process of attracting feedback on the published data, which helps to improve the quality of the data. During the case study this appeared to be the major difficulty in ensuring data re-use. For example, the identification of the community and its stakeholders was very difficult, according to one of the data owners: “We tried to put ourselves in the shoes of the participants of the hackathon and found we could come up with a myriad of stakeholders.”

Managing the Data

The responsibility of the information manager and the data owners was found not to stop after publication. Although the hackathon was finished after one day and the data were only published within the environment of this one-day activity, data owners still found that they needed to make a plan for how to manage the data and make sure that the data quality remains at the desired level. They also said that they would like to attract feedback from users, and that the information manager needs to be prepared for this, as well as for requests for support during re-use. This

seemingly requires the development of some sort of platform through which data owners can interact with (potential) users. At the moment this still takes place in an ad-hoc manner, according to one of the data owners: "Open data does not have a place yet within our organization. It would be good if central servers would be installed especially for this purpose, that employees become responsible for it, and that the quality is managed." In time, the RTO is considering to open up its own data portal instead of connecting with existing portals to allow for better management, feedback and support. Activities including regularly updates of the data and metadata, asking users for feedback to increase data quality, linking the data with new datasets within the community, and tracking visitors and users.

Evaluation

The last phase of the pilot project was the evaluation of the process of opening up data. While this was not a primary activity actually ensuring that data are opened up for the hackathon, it was found to be a crucial activity in the development of an open data strategy, spurred by the lack of re-use of the data that were opened up. Furthermore, during the fall of 2012 it was decided by the Ministry of Economic Affairs that the RTO needs to adopt an open data strategy for all research carried out with public funds. Hence, open data needs to become part of the organizational process. To prepare for this, an evaluation of the pilot project was undertaken. All stakeholders were involved to see how open data can be embedded in the organizational strategy and work processes. Furthermore, the issue of community building to create more value from the datasets that are opened up was also addressed. The RTO considers open data not just as a 'compliance' issue that needs to be 'ticked off', but the organization feels the need to actively engage with the community that may want to use its data and support them in the process.

Assessing the Data Proposition

The first step of the evaluation phase consisted of assessing the value proposition of open data for the RTO. As described above, the RTO focuses strongly on enabling re-use and aims to engage more actively with the communities that could benefit from re-use. In this phase, all relevant stakeholders were involved to determine the value of opening up data. Besides financial gains, also societal gains were considered. For example, the public interest in certain datasets is considered an important reason for opening up these data by the RTO. When the pilot project was finished, a new strategy setting step took place, when top management decided to roll out an open data strategy for the whole organization. It is expected that this strategy setting will again lead to a new cycle of the lifecycle. Thus, the process of fully opening up data likely requires multiple iterations. Another aspect of open data that is assessed is linking the data to other datasets, according to one of the data owners: "Our data

will become much more valuable if it is uploaded to a local portal such as the one owned by the city of Rotterdam, in order for users to experiment with combining datasets."

Embedding the Strategy in the Organization and Work Processes

The last step of the evaluation phase is embedding open data in the organizational strategy and processes. This is the responsibility of top management. In the case of the RTO this meant that the open data lifecycle started anew, this time adjusted to fit the newer objective of opening up all data that are publicly funded. This means that on all organizational levels adjustments may be made to the work processes. As the pilot project already activated some data owners to actively become involved in communities around the data, we found that the project manager needs to balance innovations from top-down and bottom-up. A data owner: "We need top-down as well as bottom-up support for open data. From a strategy to support our activities, to a well-supported data portal: it is all necessary."

11.5 Findings and Discussion

The findings from case study support the findings from literature as we found that the five phases were also applicable to the process of opening up data in the case study. Based on the findings from the case study, however, the number of steps per phase was limited to two, refining the activities of the lifecycle model of Table 11.1 to a ten-step process. The main reason for this was to make sure that all steps of the lifecycle model have a comparable level of detail. Furthermore, the case study identified a number of additional steps to be taken that were not found in literature. The differences between the existing and the refined open data lifecycle mode are shown in Table 11.3.

In line with Ruparelia (2010) and Kalampokis et al. (2011) we found that the existing open data lifecycle models focus mainly on the technical aspects of opening up data to allow for publication in order to be compliant to open data regulations. Especially in the preparation phase focus is on the technical steps ensuring publication. However, we found that re-use is strongly determined by the involvement of (potential) users of the data. For data owners, community building in the identification phase is already very useful to make a well-informed decision about which data to open up. Involvement of users and other external stakeholders early in the process thus enhances the chance of data re-use. The RTO in the case study currently focuses on community building with stakeholders outside the organization advertising the value of the data and ensuring re-use. We found that stakeholder involvement and community building should get a more central place in the lifecycle model and therefore called our model a community-driven lifecycle model.

Table 11.3 Comparing the refined open data lifecycle model with existing models

Lifecycle phase	Steps per phase (literature)	Steps per phase (case study)	Main differences
Identification	Setting the strategy	Setting the strategy	–
	Selecting the data	Selecting the data	Data owners noted that it would be useful to understand early on who are (potential) users to select useful datasets for opening up
Preparation	Setting requirements	Setting requirements	–
	Modelling and describing data	Technically preparing the data	We found that existing models have a strong technical orientation, focusing on a lot of details this preparation phase
	Converting to machine-readable data format		
	Linking data		
	Storing data		
Publication	Publication of data	Ensuring findability	The process of publishing entails more in practice than described by the models based on literature
	Publication of metadata	Advertising the data	Rather than merely focusing on technical findability, actually advertising the data is necessary
Re-use	Exploiting of published data	Community building	Exploitation requires active involvement with the community
	Data management	Managing the data	–
Evaluation	Developing business propositions	Assessing the data proposition	The data proposition needs to be aligned with the strategic purpose of open data, and not just focus on compliance or re-use by others
	Monitoring and improving data	Embedding into strategy and work processes	Balancing top-down strategy for open data and bottom-up initiatives (e.g. community building)

Furthermore, we found that lifecycle models often focus on publishing data following the notion of compliance by making sure that they have opened up their data and that they forget to follow the steps after the data has been published. Instead of focusing on supporting the process of re-use or evaluating the process, the existing lifecycle models merely envisage steps such as managing the published data, without considering the strategic importance of open data. In this way, opening up data remains an incidental process, rather than becoming an organizational routine to be applied to all relevant data within the organization. Therefore, in addition to community building, also organizational stakeholders such as legal advisors should be involved more in the process to embed open data into the organization strategy. This likely ensures the value of opening up data for an organization.

Finally, we found that opening up data is iterative. Given the complexity, organizations likely go through multiple cycles to ensure optimal learning effects, or return to a previous step. This may help to gradually develop an open data strategy. Whereas the first cycle can serve as a pilot project for opening up a few datasets, a full strategy may be developed in a second cycle. A third cycle may be necessary in large organizations with laggards only included when the open data strategy is fully developed. Therefore, this model can serve as inspiration rather than as a prescription. Depending on where an organization currently finds itself in the process of opening up data, the lifecycle can be entered.

Further research should focus on how to align open data with the business proposition of organizations, as well as with the technology. While the lifecycle model that was developed in this paper is based on literature and practice, it was not validated for all organizations and for different open data strategies. Depending on the purpose of opening up data (e.g. compliance or commercial gains) the steps that are taken may have different consequences. Therefore, to better understand the implications of the different open data strategies for the steps to be taken, the model should be validated using different types of organizations. Furthermore, this paper found that the process of opening up data should address technical as well as organizational aspects. One important implication is that further research should look at how community building can strengthen open data strategies and stimulate re-use. Further research should thus look into how the interplay of technical and organizational aspects takes place in practice and how they can be aligned during the process of opening up data.

11.6 Conclusion

Many (semi-)public organizations are in the process of opening up their data to the public. However, they often find this process cumbersome and they do not know which steps to take. Lifecycle models for open data have been developed guiding the process of opening up data, but these are not often based on empirical findings. Therefore, we developed an open data lifecycle model based on literature and practice, using a case study of a semi-public organization in the Netherlands. Based on literature we identified five generic phases of opening up data: identification, preparation, publication, re-use, and evaluation. These were validated by the case study. We found that while most of the existing lifecycle models focus on the technical aspects of opening up data in order to be compliant, the involvement of external stakeholders for community building in the early stages of the lifecycle model is already relevant to allow for re-use. Furthermore, the involvement of organizational stakeholders was found to be essential for embedding the open data strategy into the organization. Further research should look into how community building around open data can be developed further, and at the alignment of open data with other organizational goals as well as with the technology, to allow for proper embedding of open data in the organization.

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Chapter 12
Social Web Ontology for Public Services

Mark Krijgsman, Wout Hofman and Geert-Jan Houben

Abstract In the Social Web, a large number of individuals stores and shares private data in social networks like Facebook and Twitter. By agreeing with their license agreements that support a revenue model, which is mostly advertising, occasionally combined with (premium) subscription and transactions, these individuals transfer data ownership to these social networks. As individuals, citizens store a lot of data in social networks that is also relevant to government. This chapter proposes an open peer-to-peer social network architecture, based on data ownership by each individual and a Social Web Ontology for interoperability between the peers. Security mechanisms are an important feature of such a network. By extending the Social Web Ontology with concepts and properties for e-Government Services and applying open data principles, the architecture can also be used by authorities. The proposed architecture includes an advertising revenue model that can be offered by intermediaries storing user owned data. All will prosper by sharing as much data as they are willing, thus interoperability amongst providers is required. An architecture in which a citizen not only can own its data, maintain its social network and sells its data to advertisers, but also provides data to authorities to apply for particular government services, addresses both dat but in some occasions also on subscriptions a privacy challenges and eGovernment services. Authorities can play an important role by stimulating the implementation of a Social Web Ontology, initiate the development of data privacy monitoring modules warning users of potential privacy issues when selling data, and base public services on the Social Web Ontology. It will also allow users to present themselves differently in different contexts based on access control settings, e.g. private, professional, and citizen.

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12.1 Introduction

Since the launch of the first large social networking website SixDegrees.com in 1997 (Boyd and Ellison 2007), the Social Web has seen a significant increase in its size. Rather than simply consuming websites, users began to generate their own content as well (Kaplan and Haenlein 2011), marking the start of Web 2.0 and the Semantic Web (Gormode and Krishnamurthy 2008). Social websites responded to this new trend by providing users with the ability to create their own personal profile where they could list friends, post photos, status updates and more. Later, some of these websites also provided plug-ins used to integrate their functionalities on third-party websites. One of the main issues with constructing the Social Web is data privacy (Zheleva and Getoor 2009) and data ownership: "the ability to access, create, modify, package, derive benefit from, sell or remove data [and] the right to assign these access privileges to others" (Loshin 2001).

There are already first prototypes of a distributed social network based on semantics (Tramp et al. 2012), that address issues like data ownership and— privacy, and propose rudimentary interoperability based on Application Programming Interfaces (APIs). These initiatives propose a distributed social network with advantages like increased privacy based on data ownership, increased data security based on the distributed nature of data, extensibility and reliability due to the distributed nature, and the freedom to communicate.

One of the most important aspects for constructing a distributed Social Web is its revenue model. Research in this particular area indicates that revenue management is mostly based on advertising, but in some occasions also on subscriptions and transactions (Falch et al. 2009; Enders et al. 2008). Enders et al. (2008) provide a good overview of the revenue models of a number of relevant social network providers. The management impact of specific choices are in this respect important, e.g. by including as many users as possible, a focus on advertising is achieved (the lengthening of the 'long tail'). Focus on transactions requires trust of an intermediary social network provider. In our architecture, the primary focus will be on the advertising model, although we will argue a transaction model is also well suited for a distributed social network based on intermediaries.

Since a large number of individuals are member of one or more social networks and the functionality of these networks constantly evolves to increase revenues, these individuals manage a lot of data in those networks. This data comprise for instance relationships with others, birth date, addresses and so on. In their role of citizen, individuals also manage this (and more) data with authorities to apply for government services (Hofman and Staalduinen 2010). By using data stored in distributed social networks, individuals are able to complete eGovernment services. By extending the ontology of distributed social networks and applying Linked Open Data concepts (Heath and Bizer 2011), authorities will be able to monitor citizens and provide eGovernment services, controlled by citizens. Citizens still need to be in control of data accessibility. This particular application of the Social Web differs from its usage by authorities as a participation instrument.

This chapter will first analyze the social web functionality and present an application architecture that can be supported by the technical architecture of Tramp et al. (2012). As such, this chapter takes an architectural view separating a business—an application—and a technical view (Lankhorst et al. 2005). The main focus of this chapter is the application view of an artifact that allows individuals to manage their data, sell or provide data to suppliers, and utilize the data for public services. Although they are not specified in this chapter, technical services are required as enabler. This application view is a (first) model of an artifact as identified by Hevner et al. in design-science research (Hevner et al. 2004). The model is not yet constructed (although there are already first instantiations of constructs (Tramp et al. 2012)), nor evaluated. It addresses the problem of data ownership and—privacy in social networks, whilst also providing a business model and contributing to eGovernment. We have looked at initiatives like Diaspora and One Social Web that try to construct a distributed Social Web. Recent developments are the locker project (lockerproject.org) addressing data ownership and—privacy and Avatar (http://www.avatar.ai) that allows a user to manage its social network and data independent of a social network provider. Most of these initiatives lack a business approach and are technical driven. There are a variety of (commercial or free) digital lockers for storing private data, but most of them are similar to for instance Dropbox; they do not contain structured data.

First of all, this chapter analyzes the functionality of the Social Web, secondly, specifies an interoperability ontology between different implementations of the components will be given, and thirdly the various application components are specified. The specification of the components utilizes technical protocols for sharing particular instances of the ontology. The last section presents our conclusions and further research.

12.2 Functionality of the Social Web

To be able to construct an artifact that can function not only in the Social Web, but also interface with authorities, the Social Web functionality needs to be explored. This section presents definitions of the Social Web and a categorization of functions offered by various providers of the Social Web.

Definition of the Social Web

There are various definitions of the Social Web, e.g. Kim et al. (2010): “We define social Web sites as those Web sites that make it possible for people to form online communities, and share user-created contents (UCC’s)”. Boyd and Ellison (2007) give a definition for social network sites: “We define social network sites as web-based services that allow individuals to (1) construct a public or semi-public profile

within a bounded system, (2) articulate a list of other users with whom they share a connection, and (3) view and traverse their list of connections and those made by others within the system." Lastly, Richter and Koch (2008) define social networking services as follows: "Social Networking Services (SNS) are application systems that offer users functionalities for identity management (1) (i.e. the representation of a person e.g. in the form of a profile) and enable furthermore to keep in touch (2) with other users (and thus the administration of own contacts)".

Based on these definitions, we observe that both the ability to create a personal profile and the ability to connect with other user's personal profiles are important aspects in making a website social. Furthermore, Kim et al. (2010) emphasize the sharing aspect of a social website by the exchange of User-Generated Content (UGC), which we also include to form the following definition of the Social Web: "The Social Web is a collection of websites that enables its users to construct their own profile, connect with other users and allows for exchanging of user-generated content." Any website that is part of the Social Web as defined above will be referred to as a social website. UGC is used to describe content that is being shared rather than user-created content (UCC), since the latter is only loosely defined as "photos, videos, bookmarks of Web pages, user profiles, user's activity updates, text (blog, microblog and comments), etc." (Kim et al. 2010), while Kaplan and Haenlein (2011) give a much more precise definition of UGC: "UGC needs to fulfill three basic requirements in order to be considered as such: first, it needs to be published either on a publicly accessible website or on a social networking site accessible to a selected group of people; second, it needs to show a certain amount of creative effort; and finally, it needs to have been created outside of professional routines and practices." With these definitions of Social Web and UGC, we are able to distinguish social websites from other websites. However, only a distinction according to these definitions is insufficient for constructing a distributed Social Web in which users own their UGC and UCC. A further analysis of functionality is required.

High Level Functionality of the Social Web

There are various studies for categorizing the functionality of the Social Web. Before choosing one that encompasses the most functionality, this section analysis a number of categorizations. Kietzmann et al. (2011) describe a categorization, called the honeycomb framework, which is able to categorize social websites using seven functional building blocks (FBB's). A social website can then be typed by the extent to which they focus on some or all of these FBB's. The definitions for each of these FBB's are shown in Fig. 12.1.

A social network provider may be providing functionality that is a combination of any of these seven FBB's, depending on the objective that the websites wishes to achieve; a professional networking website such as LinkedIn is likely to be providing functionality that emphasizes the Identity, Relationships and Reputation FBB's, while a website such as Foursquare is likely to put more emphasis on the Presence and Sharing FBB's.

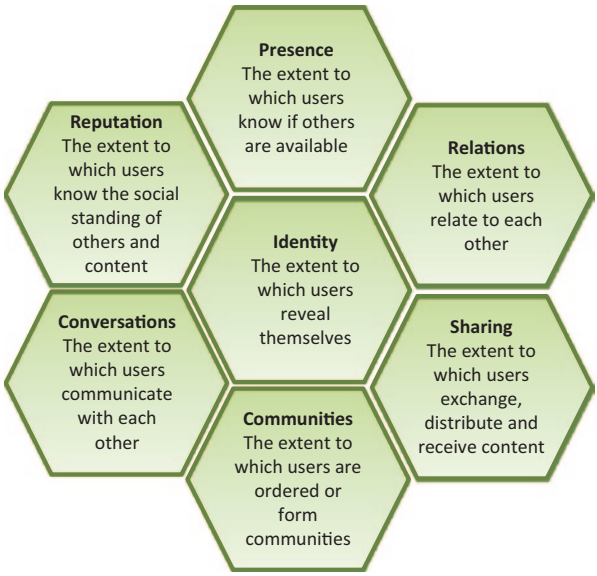

Fig. 12.1 The honeycomb framework

Kim et al. (2010) categorizes social websites with eight essential features. In order to obtain these features, the primary objectives of social network providers are first defined as follows: "to enable the formation of online communities, interactions among members of such communities, and the sharing of UCC's". Based on these objectives, the features are: (1) personal profiles, (2) establishing online communities, (3) participating in online groups, (4) communicating with online connections, (5) sharing UGC's, (6) expressing opinions, (7) finding information, and (8) user retention. Kaplan and Haenlein (2011) categorize social network providers by four different terms: (1) self-presentation, (2) self-disclosure, (3) social presence, and (4) media richness in terms of the amount of information to be transmitted at time intervals.

Analyzing these categorizations of functionality learns that those of Kim et al. (2010) and Kietzmann et al. (2011) fit with the definition of Social Web in which individuals are able to construct profiles, connect with each other and are able to share UGC. The categorization of Kaplan and Haenlein (2011) does not fit this definition, since the mapping of its categorization to the definition of the Social Web is not that trivial. Mapping the categorizations of Kim et al. and Kietzmann et al. learns that they can be reasonably related to each other. Kim et al. includes both the finding of information and holding of users in their listing, while Kietzmann et al. includes reputation. However, the additional categories of Kim et al. are not necessarily unique to social network providers; it can be argued that every website wishes to retain users and facilitates search. Reputation on the other hand represents a more social category of functionalities in which users are able to judge the position of other users. Mapping the categorization of Kaplan and Haenlein (2011) and Kietzmann et al. (2011) learns that the categorization of the latter is more fine-grained. Based on this analysis, the honeycomb framework of Kietzman et al. is considered

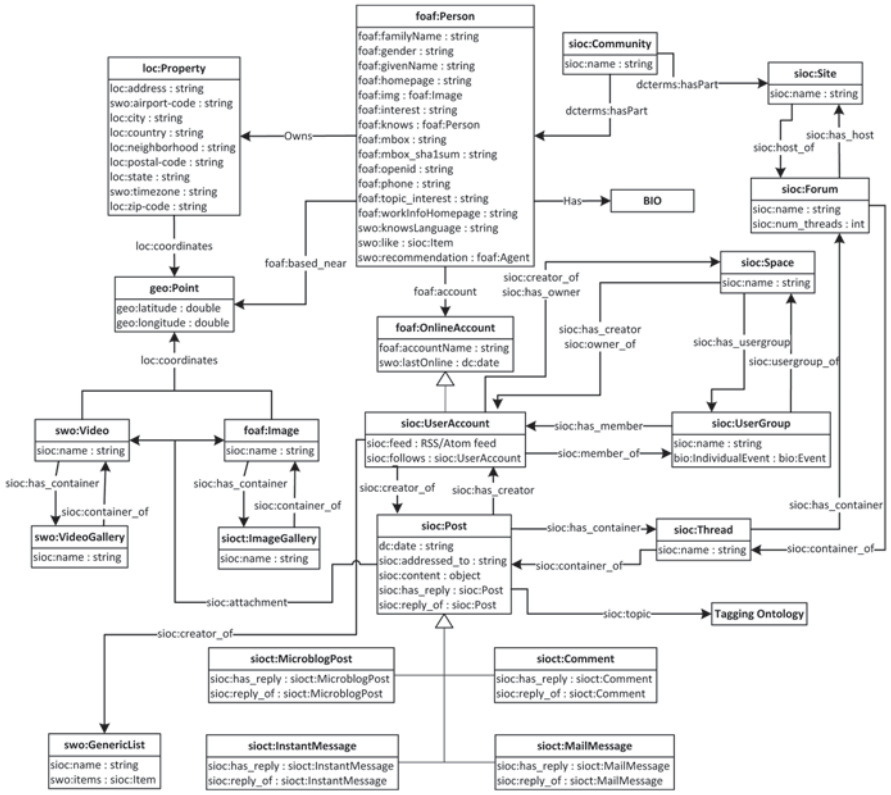

Fig. 12.2 The social web ontology

to specify functionality of social network providers. The honeycomb model can be more detailed based on an analysis of social network providers (see annex).

12.3 Social Web Ontology

The ontology needs to support the identified functionality of the Social Web and is the basis for interoperability amongst different implementations of components constructing the Social Web. Like in the Semantic Web (Berners-Lee et al. 2001), each implementation of our Social Web artifact is a resource that stores and shares data. There are different ways to construct ontologies, e.g. by machine learning (Davies et al. 2006) and with clear guidelines (Noy and McGuiness 2001). In this chapter, the guidelines of Noy and McGuiness (2001) are applied. These guidelines distinguish between describing the domain, specifying the scope, identifying existing ontologies, and create a Social Web Ontology (SWO, see Figs. 12.2 and 12.3, representing the ontology as a Unified Modeling Language (UML) class diagram).

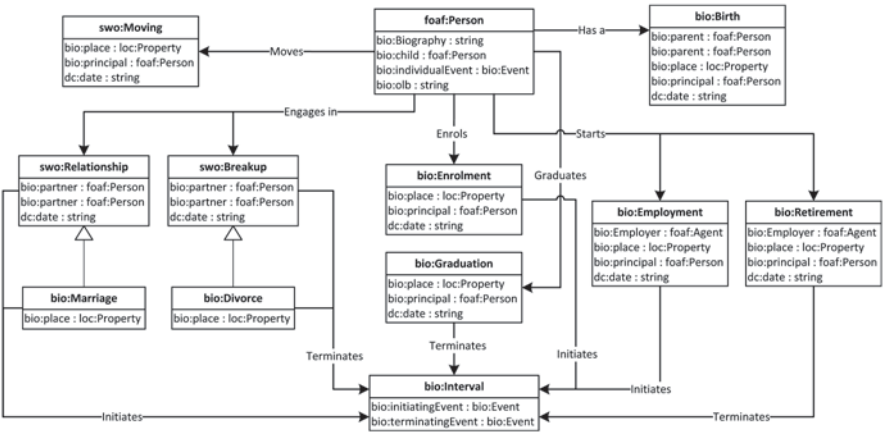

Fig. 12.3 Details of BIO

As can be seen, parts of the following ontologies are re-used (the italicized words refer to the functionality of the honeycomb framework, see before):

- Friend of a Friend (FOAF) for specifying *identity* and *presence* of a person and its *relation* with other persons. WebID's used by our artifact combine FOAF with SSL, thus the selection of WebID's implies the use of FOAF. In this respect, the identity is that of an individual. Additions for a professional experience and education are represented by the Biographical Information Ontology (BIO).
- Semantically-Interlinked Online Communities (SIOC) supporting *communities* and UGC/UCC sharing and conversations, not only in communities, but also with other users. SIOC builds upon FOAF and is thus selected as part of our SWO. SIOC is for instance also used by Web 3.0 LifesShare to support private conversations between users on mobile devices (Story et al. 2011).
- Tagging Ontology (TO) for allowing persons to tag specific resources. Tagging can have a function for reputation.

Additional ontologies are used to refine SWO, e.g. minimalistic Location Ontology (LOC) to specify location properties of a person, Dublin Core (DC), of which the metadata property to describe the date of things is re-used, and Basic Geo Vocabulary (GEO) to specify geo-coordinates to represent the location of a person. These ontologies are identified by search. Besides adding certain specific concepts supported by only a limited number of social network providers (e.g. airport code supported by Flickr, languages that a person knows, and the support of videos and images tagged with a location), the following concepts are added to complete the functionality (identified as Social Web Ontology, SWO):

- Likes of things (sioc:item) and recommendations about other persons (foaf:agents).
- Last online to specify at which time functions in relation to a particular person could be activated by other persons.

- Lists for generalization of other lists already specified in for instance SIOC (e.g. FavouriteThings, OfferList, and Playlist).

12.4 Social Web Architecture

This section presents the components of the application architecture and their interfaces. Since individuals are data owners, Authorization and payment for data will be elaborated.

Basically, the application architecture distinguishes users (persons) and advertisers to support the advertisement model. Users can either decide to store data locally or have it stored by a trusted intermediary. This intermediary, a so-called middleman, offers services to both a user and advertisers. In case a user stores it's data locally, identified as advanced user, advertisers have to be able to crawl all potential users to be effective, which is feasible but time-consuming. Therefore, in terms of revenue models, an intermediary is both of added value to users and advertisers. As users own all their instances of the ontology, owners can decide which data they are willing to provide to advertisers.

This approach results in the following application components and their functionality (Fig. 12.4). A 'product' has all end-user functionality. Based on the Semantic Pingback protocol, an extension of the Pingback protocol (Landridge and Hickson 2002) for linking different resources, data is shared between middle-man service components operated by different intermediaries. Semantic Pingback is based on the following approach: (1) a linking resource links to another (Data)Web resource, here called linked resource; (2) the Pingback client is either integrated into the data/content management system or realized as a separate service, which observes changes of the Web resource; (3) once the establishing of a link has been noted, the Pingback client tries to auto-discover a Pingback server from the linked resource; (4) if the auto-discovery has been successful, the respective Pingback server is used for a ping; (5) in order to verify the retrieved request (and to obtain information about the type of the link in the semantic case), the Pingback server fetches (or de-references) the linking resource; and (6+7) subsequently, the Pingback server can perform a number of actions such as updating the linked resource (e.g. adding inverse links) or notifying the publisher of the linked resource (e.g. via email). New data retrieved by an intermediary is available to an end-user by the PubSubHubbub protocol.

We distinguish three different components in the design:

- Middle-Man Service. This component contains all of the data that regular users choose to store with them. Figure 12.4 shows that both products and users authenticate with middle-man services using WebID's, which gives access to the database containing the user data. Permission management is facilitated using the Privacy Preference Ontology (PPO) (Sacco and Passant 2011) and the Privacy Preference Manager (PPM) (Sacco et al. 2011). Middle-man services

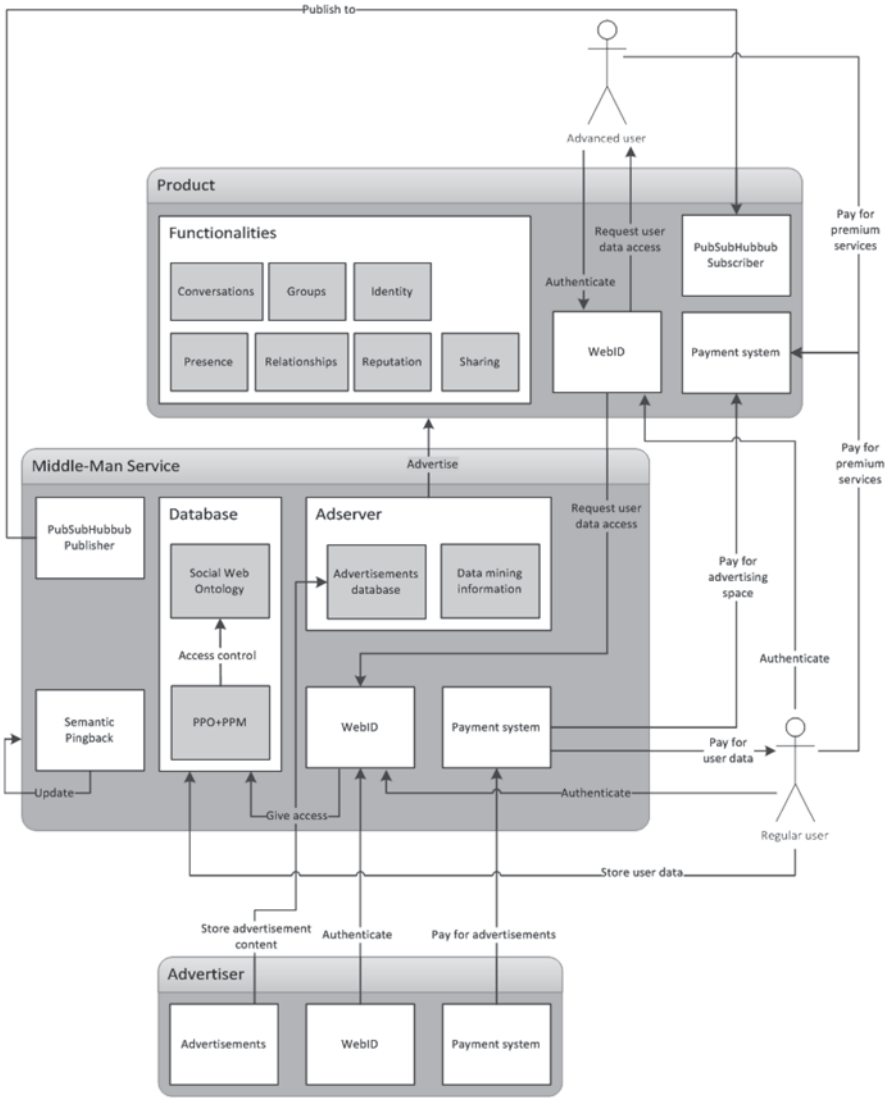

Fig. 12.4 Application components and their functionality

also contain an adserver that is used to target specific users with advertisements. Advertisers can authenticate with middle-man services in order to store advertisement content in this adserver, which the middle-man service can then use to target a specific audience after the advertiser has made the necessary payments.

- Product. Although pictured as one entity, the Product component contains the basic functionality that each app on a smart device, website or other product from third-party developers must provide in order to successfully cooperate with the

middle-man services that provide the data for the products. Users, both regular or advanced users, authenticate using WebID's and updates are received from middle-man services using PubSubHubbub.
- Advertiser. The third component represents the advertisers that want to make use of the middle-man services' data in order to target a specific audience. Since the advertisers only have to communicate the content they wish to advertise and the corresponding payments for the advertisements, their component is relatively simple.

Because the components often share protocol endpoints, we will not describe the system from the perspective of the different components in order to prevent having to explain the same protocol for each of the components. Instead, we will focus on authorization and payment, since authorization is the basic function specifying data ownership, allowing users to share data, an intermediary to mine user data, and users getting paid for advertisements.

As the previous figure shows, WebID's are used for user authentication; it is proposed to use a combination of WebID's and Access Control Lists (ACL), known as WAC (Hollenbach et al. 2009). Unfortunately, while WAC is suitable for our requirement, the restrictions that can be imposed on resources are not specific enough, because the ACL's can only restrict access to complete files, not to the specific resources located within the file. Therefore, we use the Privacy Preference Ontology (PPO) (Sacco and Passant 2011) and the Privacy Preference Manager (PPM) (Sacco et al. 2011) on top of WAC in order to gain the detailed access control that we need. PPO enables us to restrict access to resources based on properties of a user, such as a particular URI, the location of a person, or the position of a person in a network of people. Based on the presence or absence of properties, PPO can assign an appropriate level of access control. The type of access control available to PPO are the same as WAC; read, write and control. Since we define six levels of data ownership, we will need to extend the types of access control available to PPO with selling, creation and removal in order to suit our needs. PPO is further extended in the PPM, where the user is given a user interface with which RDF files describing the desired restrictions on resources can be automatically generated, using the PPO. Following that, the SPARQL queries needed to check whether other users satisfy the necessary properties to access the resources can be generated as well. Furthermore, PPM supports authentication with WebID's and PPM instances managing a user's data can be hosted anywhere.

All three components in the system need a payment system in order to make the following transactions:

- Advertisers: Issue payments to middle-man services to serve advertisements to users
- Products: Receive payments from middle-man services for advertising space and receive payments from users for premium services and other fees, if any
- Middle-man services: Issue payments to users for user data, issue payments to products for advertising space and receive payments from advertisers for advertisements served

Since WebID is already used for authentication throughout the design, it is preferable to use a payment system that is capable of working with WebID's as well. However, we have not found an (open source) payment system which supports authentication with WebID. There is some indication that PayPal will be looking into OpenID for authentication, as they are a substantial contributor to the OpenID foundation, which can be useful because it is possible to combine WebID's and OpenID's. Until then, the only solution is to use an existing payment system that still uses username/password credentials to authenticate users.

12.5 Social Web Ontology for Public Services

This section briefly discusses the Social Web Architecture and its relevance for eGovernment or public services. A Social Web Ontology (SWO) and access control mechanisms are the core of a distributed Social Web architecture. The SWO is the basis for a database storing individual's information. The Social Web Architecture and SWO can now be applied by citizens in two ways, namely (1) to synchronize their data with authorities and complete forms for eGovernment services or (2) by providing access to their private allow authorities to provide eGovernment services.

In the first approach, the SWO has to be matched (Euzenat and Shvaiko 2010) to government ontologies, an interface between the Social Web Architecture with government reference data (Hofman and Staalduinen 2010) needs to be constructed, and eGovernment services have to be able to retrieve data from government reference data. Citizens can use the Semantic Web Architecture to feed data into eGovernment service via synchronization of their individual data with government reference data. Ontology matching (Euzenat and Shvaiko 2010) only identifies common concepts and properties in two ontologies. By creating a networked ontology with SWO as upper ontology, one or more government ontologies can be created. In this particular approach, SWO needs to be extended with concepts and properties reflecting basic reference data required by authorities, e.g. the value set for streets and addresses, birth day notations, and family associations. An intermediary can decide to extend its middle-man services with this particular government ontology, thus adding value and extending its business model to individuals. Authorities can provide an interface for data synchronization of the reference data, depending on the government ontologies supported by these intermediaries. The extended SWO can provide data to public service forms, thus enabling a citizen to complete such a form with his basic data.

In the second approach, a similar networked ontology with SWO as upper ontology can be constructed and implemented by an intermediary. Public service ontologies can be created based on the government ontology reflecting basic reference data, e.g. an ontology for social benefits and another one reflecting particular types of permits. An intermediary can decide to implement one or more of these public services ontologies, thus increasing their value to individuals. By implementing the

observer pattern (Gamma et al. 1994), intermediaries are able to detect state changes of data and generate events (Event Driven Architecture or EDA (Erl 2005)). Individuals grant data access to authorities and authorities evaluate state changes of accessed data and provide applicable services. The Social Web Architecture may implement access control mechanisms like PPO (Sacco and Passant 2011) and PPM (Sacco et al. 2011), but PPO needs to be extended with an ontology specifying data accessibility by a particular authority. Hofman (2013) describes how such an architecture based on Linked Open Data (Heath and Bizer 2011) can be developed in for instance public services for global trade facilitation. In that particular example, a logistics ontology applied by traders is extended with concepts and properties relevant to customs. The same approach can be taken with respect to other public services, like those relevant to individuals. As different authorities provide public services, SWO needs to be extended and aligned with those concepts and properties not yet covered by it and required by public services of authorities. For instance, basic reference data for addresses managed by an authority uses a particular notation for streets and cities. In case individuals use the SWO also in their role of citizen, they will have to adhere to this notation. To avoid complexity by constructing one ontology, a proposed solution is to create a networked ontology with the SWO and government reference data as a core or upper ontology. Each public service domain, e.g. tax—and social benefit services, is supported by an ontology importing (relevant parts of) an upper ontology. Although we have experience in trade facilitation, still further research and development is required in this respect.

12.6 Conclusions and Discussion

In this chapter, we have analyzed the functionality of the Social Web and proposed a Social Web Ontology (SWO) supporting interoperability between different implementations of the Social Web. We have constructed an artifact (Hevner et al. 2004) for an advertising revenue model based on a fine-grained authorization that can be managed by a data owner with inclusion of a payment system. The IT artifact is not yet complete. For instance, there are no metrics yet on accuracy, performance, reliability, and usability (Hevner et al. 2004). Furthermore, it is also not yet complete and consistent, potential revenue models may impact the artifact, e.g. an advertiser could also construct a data mining module collecting data from intermediaries. Only analytical design evaluation is currently feasible. We have developed a number of use cases to illustrate the operation of a distributed implementation of our artifact, but have not mentioned them to focus on the artifact itself. Our proposed artifact encompasses the SWO as a basis for data storage and sharing. Refinement of the artifact will also affect the proposed SWO; validation by its functionality is in line with validation of our proposed artifact, which requires further research by for instance constructing a Proof of Concept in collaboration with potential users and advertisers leading to controlled experiments.

The support of a revenue model, an explicit specification of SWO for data sharing amongst different implementations of the artifact, combined with the

Distributed Semantic Social Network (DSSN, Tramp et al. 2012) could be a basis for a next generation Social Web in which data owners are able to set their privacy and sell data to businesses thus addressing the problem of data privacy. A user can sell his/her data to whatever advertiser he would like, but in some occasions a user might be warned of the potential impact of selling data. Different types of privacy rules will have to be specified that cater with semantic linking of data from different sources. This subject needs further study, possibly implementing in a privacy monitoring tool warning a user of his/her activities.

Open innovation with an SWO can be the basis for growth of Social Web functionality. Authorities can play a role in this respect, e.g. the European Union could enforce implementation and governance rules of the SWO by means of a Regulation (an EU Regulation is binding for all Member States of the EU and thus can lead to interoperable solutions). Also the World Wide Web Consortium can play an important role by a recommendation on the use of SWO with a Social Web Architecture and a governance mechanism to extend functionality.

Besides addressing the privacy issue, the artifact can also be used by authorities in two ways. Firstly, they can also adopt and extend the SWO for interfacing with citizens. Authorities collect and store a lot of data of citizens and enterprises in their governance—and public service provider role. By constructing particular government components and possibly extending the SWO for specific information requirements, intermediaries can extend their functionality and probably offer a subscription revenue model to users, since they assist users in their relation with authorities. The functionality can be used to share information on property (loc:property), moving from one location to another (swo:moving), etc. Secondly, authorities can automatically receive any changes relevant to their services based on agreement on particular events via the Semantic Pingback protocol, e.g. the ‘move’—and ‘retire’ events are examples already modeled. It allows authorities to access the particular data with Linked Open Data (Heath and Bizer 2011), evaluate any relevant state changes, and offer pro-actively services to citizens and enterprises. In case authorities decide to implement (an extended) SWO, they can also be launching customer of the proposed Social Web Architecture by allowing intermediaries to offer a subscription and transaction revenue model to users. It also allows authorities to utilize the Social Web for other purposes, e.g. initiating discussions in forums and interacting with citizens. The second approach, authorities subscribing to user events and data ownership by citizens, requires another view of governing and could lead to a lean government.

12.7 Annex: Detailed functionality of the Social Web and analysis of providers

Based on this high level functionality, functionality of various social network providers is analyzed leading to a more detailed specification of functionality (Table 12.1).

A number of social network providers has been evaluated with respect to the above mentioned functionality. Table 12.2 lists the results of this analysis.

Table 12.1 Detailed functionality that is offered by at least two or more representative social network providers

Functional building block	Functionality
Conversations	Chat
	Contacts activity feed
	Forum
	Posting comments
	Posting status
	Private messaging
	Tag content
Groups	Creation of lists
	Divide contacts into lists
	Join and create public, open groups
	Join and create public, invitation only groups
	Join and create private, invitation only groups
Identity	Management of privacy settings
	Sign in with other services
	Suggests things you like
	Tag contacts
	Personal information
Presence	Attend and/or create events
	Include current location in status update
	Indicate where a photo was made
	(Latest) online indication
	Share where you are
	Share who you are with
Relationships	One-way contact verification
	Two-way contact verification
	Contact import
	Find users by email
	Find users by name
	Indicate special relationships with other contacts
	Invite others by email
	Suggests users with similar interests
	Suggests users you may know
	Use contacts to progress in games
Reputation	Favorite (photos/videos)
	Likes (and dislikes)
	Professional company pages
	Recommendations
Sharing	Bookmark sharing
	Game scores and achievements
	Web feed
	Upload photos
	Upload videos

Table 12.2 Analysis of functionality provided by social networks

	Facebook	Flickr	FourSquare	Google+	Habbo	LinkedIn	Reddit	Twitter	Yelp	YouTube
Conversations	√	√	√	√	√	√	√	√	√	√
Chat	√			√	√					
Contacts activity feed	√	√	√	√		√		√		
Forum							√		√	
Posting of comments	√	√	√	√	√				√	√
Posting of status	√			√	√	√		√		
Private messaging	√	√		√	√	√	√	√	√	√
Tag content		√								√
Groups	√	√	√	√	√	√	√	√		
Creation of lists			√					√		
Divide contacts into groups	√			√	√					
Join and create public, open groups	√	√			√	√	√			
Join and create public, invitation only groups	√	√				√	√			
Join and create private, invitation only groups	√	√				√	√			
Identity	√	√	√	√	√			√	√	√
Management of privacy settings	√	√	√	√						
Sign in with other services		√	√		√					
Suggests things you like	√					√				
Tag contacts	√	√		√						
Personal information	√	√	√	√		√		√	√	√
Presence	√	√	√	√	√			√	√	√
Attend and/or create events	√								√	
Include current location in status update	√		√					√		
Indicate where a photo was made		√		√						
(Latest) online indication	√		√	√	√					√
Share where you are	√		√						√	
Share who you are with	√									
Relationships	√	√	√	√	√	√	√	√	√	√
One-way contact verification		√		√			√	√	√	√
Two-way contact verification	√		√		√	√			√	
Contact import	√	√	√	√		√		√	√	
Find users	√	√	√	√	√	√		√	√	
Indicate special relationships with other contacts	√									
Invite others by email	√	√								
Suggests users with similar interests				√				√		√
Suggests users you may know	√	√	√	√		√				
Use contacts to progress in games	√									
Reputation	√	√	√	√		√	√		√	√
Favorite (photos/videos)		√								√
Likes (and dislikes)	√			√		√	√		√	√
Company pages	√		√						√	√
Recommendations		√				√			√	
Sharing	√	√	√	√	√	√	√	√	√	√
Bookmark sharing	√		√	√		√	√		√	
Game scorese and achievements	√				√					
Web feed		√	√		√	√	√	√	√	
Upload photos	√	√		√					√	
Upload videos	√	√		√						√

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