

From Open Innovation to Open Government:

A Multi-Level Analysis of Open Government Communities

(Kumulative Dissertation)

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1. Introduction

This thesis is entitled “*From Open Innovation to Open Government: A Multi-Level analysis of Open Government Communities*” and is written as a research synopsis for a cumulative thesis in Social Economics at the University of Hamburg. The thesis is divided in two parts. Part one outlines the objects, provides a theoretical background, and delivers a summary of the major research contributions of this work. The second part presents each of the four individual articles comprised in this. The title of this thesis refers to both Eric von Hippel’s well-known book “*Democratizing Innovation*” as well as to Chesbrough’s work on Open Innovation (Chesbrough 2003b; von Hippel 2005a). Both authors claim that the realization of innovations must become more democratized to ensure that firms gain more value from users’ increased use of information and communication technologies (ICT), which enables them to develop or create their own products and services or at least to explain their needs, use experiences and even solutions to problems (von Hippel 2005a).

Over the last decade, the field of open and user innovation has established a comprehensive understanding of why, when, and how to integrate external knowledge into formally closed innovation processes (Von Hippel 1988; Von Hippel 2005a; Gassmann 2006; Dahlander & D.M. Gann 2010). The research community has by no means remained focused on the initial research area of innovation management and product development (Franke & Shah 2003a; Füller, Bartl, et al. 2006; Füller, Jawecki, et al. 2006; Piller & Walcher 2006a). Instead, the research area of open and user innovation has influenced other research areas such as marketing, organizational, cultural, strategy, and recently, public administration research by offering valuable insights into how to contribute to more creative, collaborative and participatory online and offline innovation processes (Füller et al. 2008; Chiaroni et al. 2010; Whittington et al. 2011; Lee et al. 2012). Following Bill Joy, one of Sun Microsystems’ co-founders, who remarked that “not all the smart people in the world work for you”, open and user innovation research has provided theories, methods, toolkits, and innumerable case studies on how to systematically integrate external actors into internal, traditionally closed innovation processes (Füller et al. 2011; Jeppesen & Lakhani 2010; West & Lakhani 2008).

Similar to Eric von Hippel or Henry Chesbrough, the German philosopher and political scientist Jürgen Habermas had already begun to argue in favor of more participative elements in democracies in the 1970s. From his perspective, collective decisions should not be based on a simple aggregation of interests, but more on the arguments made by and to those governed by the decision, or their representatives (Habermas, 1996). He formulated deliberative theories of democracy, which were designed to focus on an institution’s ability to shape democratic citizens (de la Porte and Nanz, 2004). Because citizens are generally considered to possess the social and

political capabilities necessary for democratic participation, the latter may be achieved by providing constant opportunities to develop a citizen's social and political capacities through participation and thereby simultaneously improve the innovative potential of public institutions (Pateman, 1989).

The existence of the Internet has substantially strengthened both theories. Thus, research on open and user innovation began to receive acclaim circa the year 2000. In contrast to open and user innovation, which were supported by the growth of various virtual user communities, Habermas' work on deliberative theories of democracy was not immediately addressed by the Internet revolution. Instead, more static and data- or information-centered innovations, such as database virtualization or eGovernment offerings, were offered to citizens. However, recent case studies undermine the need for more systematic civic participation in governmental processes (Rowe & Frewer 2004). Considering the existing examples of more participative governmental processes, the insights generated by the open and user innovation research community thus may serve as a valuable resource for the theoretical vision of Jürgen Habermas. Thus, this research effort is motivated by the observation that the basic constellation of a "firm collaborating with customer/user" and "government/public administration interacting with citizens communities" - with the inherent relationships of planning, developing and "selling" a product or service offering - reveals many similarities on the one hand but numerous unanswered questions on the other; this thesis should help resolve at least a few of these questions. As an empirical setting, this thesis relies on two online participation projects in the German public sector, which were planned, designed, implemented and managed and evaluated by the author during the course of this project.

1.1. Overview of current research and identified knowledge gaps

ICT offer rapid access to a large crowd of creative minds at low cost, potentially on a global level (Piller & Walcher 2006b). Thus, Open Innovation approaches have become popular strategies in the private sector for systematically implementing distributed and participatory problem solving and value creation activities (Chesbrough 2003b). The basic concept of Open Innovation is that a single organization cannot innovate in isolation or, at a minimum, obtains better results when innovating in collaborative structures. Open Innovation researchers such as Chesbrough, Laursen and Salter, von Hippel and Füller state that institutions must collaborate with different types of partners to acquire ideas and resources from the external environment and remain competitive (Chesbrough 2003a; Laursen & Salter 2006; Von Hippel 2001; Füller et al. 2004). From other research, we know that external actors (users, consumers, suppliers, experts, and even competitors) can leverage a firm's investments in internal research and development activities by expanding the potential for combinations of previously disconnected silos of knowledge and capabilities and external sources of knowledge, experience, and needs (Fleming 2001; Hargadon

2003). Consequently, in a corporate context, the ultimate objective of Open Innovation is to create valuable offerings for a firm's customers, profit from investments in innovation, and improve an individual firm's economic performance by understanding the innovation and product development process as a iterative, collaborative, and integrative system (Lakhani et al. 2007).

Despite the numerous similarities of public and private innovation modes, policy innovation issues seem to differ from corporate innovation problems because they generally relate to social welfare and intangible policies rather than tangible products. Research contributions at the intersection of public policy, public administration, and information systems remain relatively silent on Open Innovation.

Existing investigations address the openness of the government-citizen interface from a broader participation perspective rather than focusing on openness and collaboration in public policy innovation (Mossberger et al. 2013). While some researchers have been particularly concerned with practices for the successful facilitation of political or civic participation, such as town hall meetings, roundtables or new dialog practices (Jordan et al. 2013; Nabatchi 2012; Yang & Pandey 2011), others have provided new insights into the role of openness in governments in democracy and empowerment (Linders 2012). The emerging research in the area of e-government examines how digital technologies and Web 2.0 afford increased transparency and accountability for governments, improve information sharing and image building, and may even offer new forms of service co-production (Meijer et al. 2012; Raus et al. 2009; Dimitrova & Chen 2006; Taco Brandsen & Pestoff 2006). The initial attempts to conceptualize Open Innovation and crowdsourcing in governments more broadly address the engagement of a diverse set of citizens and creative exploration without, however, adopting a particular focus on citizen motivation, community roles, or collaborative co-creation processes; they also do not theoretically address system design to elucidate the principles that afford the opportunity for citizen participation (Linders 2012; Lee et al. 2012; Mergel & Desouza 2013; Hilgers & Ihl 2010).

1.2. Relevance of the Thesis

This research is intended to be relevant to public economists and political (administration) science due by transferring the knowhow and expertise developed in the open and user innovation research community into this research field. Additionally, this project is highly relevant for researchers working in open and user innovation research because it offers a new field of application for existing approaches, tools and insights. The overall importance of this research topic consists of a *general, topic-related relevance* including (1) the technological, societal, economic and demographical drivers of public sector innovations (Potts & Kastle 2010), (2) the resulting demand for more collaborative & integrative approaches from a democracy perspective (Sørensen & Torfing 2011; Lee et al. 2012; Bommert 2010), (3) the need for a continuing state

modernization process (Bordas 2012), and (4) the growing disenchantment with or the decreasing interest and active participation in politics (Van Kersbergen 2010; Stoker 2013).

Further, the overall relevance and importance of this research consists of the theoretical and practical implications it derives. This thesis contributes, among other matters, to (1) the deliberative theory of democracy by, for example, suggesting new affordances on collaboration-orientated citizen participation systems (Nanz & Steffek 2004), (2) public policy analysis by introducing more collaborative methods and tools in the policy formulation stage, and (3) public policy and information systems science by suggesting new design principles for “Open Government Communities” (in the following referred to as OGC) systems. Moreover, (4) this research enriches the Open Innovation & user innovation literature by applying existing knowledge in a new domain and thereby extending it.

In addition to theoretical contributions, this research provides manifold and highly relevant practical insights. (1) Generally, due to the empirical setting, the applied participatory action research approach and the case-based methodology, the insights derived are by their nature highly relevant for practitioners. (2) Specifically, the thesis revealed insights into online communities regarding community roles, motivation and activation, which is considered the key elements of a well-framed OGC. Furthermore, (3) design principles for an OGC system were developed, which may be directly applied by system designers and managers in the public administration, politicians, and consulting agencies seeking to virtually integrate knowledgeable citizens. Finally, (4) the four articles derived various general insights on planning, realizing, implementing, conducting, and evaluating Open Government communities. The following figure graphically presents the main arguments.

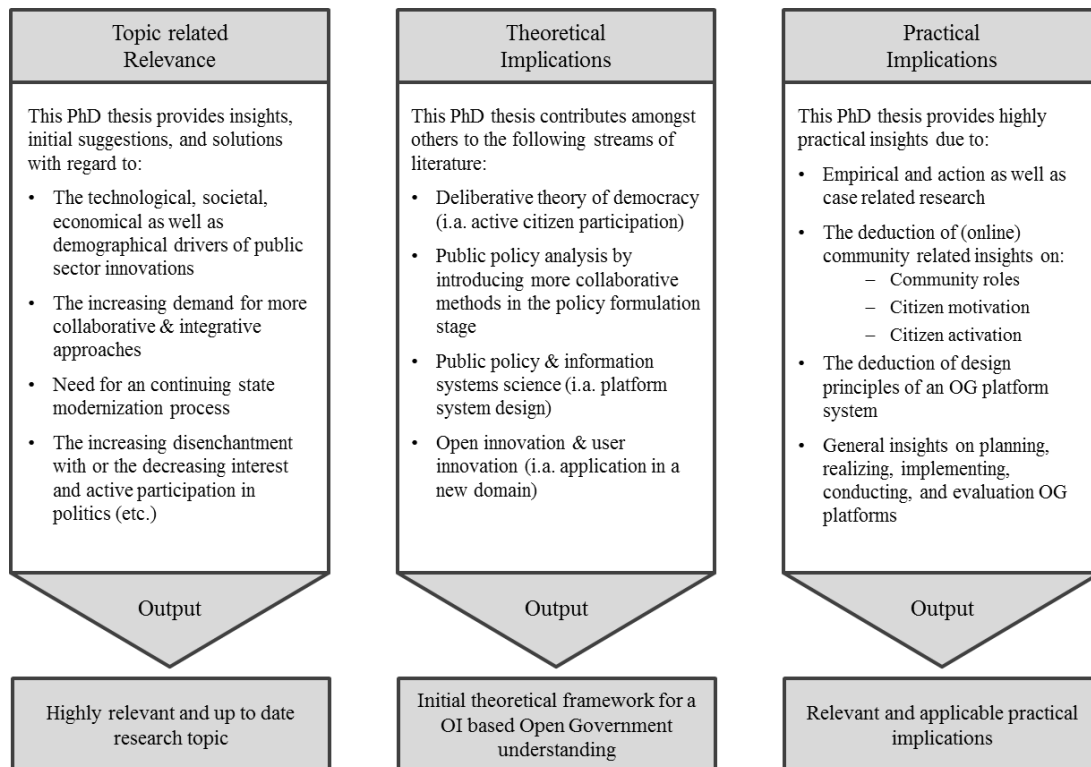


Figure 1 Relevance and Implications (source: own description)

1.3. Motivation for the Thesis

The motivation for this thesis is at least threefold. First, the research setting considered makes it possible to conduct real case-based research and interact with “real citizens,” thereby combining both the theoretical and practical perspectives. Second, it offers the potential to contribute valuable information regarding increased citizen participation in the public sector (Collm & Schedler 2012; Mergel & Desouza 2013; Brabham 2010). Therefore, it is insufficient to simply understand the community structure or the relevant technology platform; rather, it is necessary focus on holistically understanding the online participation system and how this affects the government, administration, citizens and their relationships with one another (Majchrzak & Malhotra 2013). Consequently, this thesis was framed such that the most relevant perspectives concerning a more collaboration-orientated citizen participation environment were explored, including the citizens themselves, the functioning of online communities, the state/citizen relationship, communication behavior, and finally, the platform/technology dimension. The third motivation arises from numerous arguments that summarize the theoretical and practical relevance of this topic, as listed below.

1.4. Thesis-related aims and objectives

Generally, the aim of this cumulative thesis is to contribute to an improved understanding of the potential for introducing the concept of Open Innovation into a public sector environment. Specifically, this research would like to shed light on four different dimensions:

- (1) *User and Motivation Perspective*: Why do citizens engage in Open Government communities? What motivates them to contribute valuable ideas, concepts and solutions?
- (2) *Experience and Relationship Perspective*: What represents a valuable platform experience in an Open Government community? How does this platform experience influence the relationship between citizens and administrations?
- (3) *Community Perspective*: What are the key user roles in an Open Government community? What influence does the community structure have on growth and output quality?
- (4) *Platform and Technology Perspective*: What should an Open Government platform look like? Which functionalities are necessary, and which services should be provided to obtain valuable input?

1.5. Structure of the Thesis

This thesis contains of five main parts. The “synopsis” serves as a theoretical foundation for the research projects (four separate articles) and thus contains the following chapters: (1) The introduction provided general background information related to the topic and the overall motivation for and relevance of the topic. (2) The following chapter introduces the term Open Government and related drivers. (3) The third chapter focuses on five different theoretical dimensions, which help develop a theoretical framework for Open Government. This chapter considers selected theories of democracy, public administration, political communication, communities and approaches related to technology acceptance. (4) The fourth chapter introduces the general research approach and methodology employed, including a detailed description of the two empirical cases. (5) The following chapter introduces brief summaries of each article, followed by (6) an overall discussion, which tie the empirical findings of the four studies to the different strands of theory and develop fundamental principles, which may serve as an initial framework for a theory of OGC and their citizen communities. Finally, the practical implications of this research are summarized and discussed.

2. *Approaching the term Open Government*

2.1. *The emergence of Open Government*

The emergence of the concept of Open Government may be subdivided into at least three phases and was based on the steady development of (Western) bureaucracy, administration, and political organizations (Hood 1995). Whereas the 1950s, 1960s, 1970s, and 1980s were dominated by the logic of static, non-electronic, and most important, unidirectional modes of communication from public organizations to the citizens, the last twenty years have witnessed the development of entirely new modes of a state-citizen interaction (Dunleavy & Hood 1994; Alonso et al. 2013). The traditional aspect of “static information” has been enriched by greater communication, transaction, transparency, and recently, even participation- and integration-orientated developments (Barzelay 2001).

The 1990s have often been termed the decade of the “New Public Management” (Pollitt & Bouckaert 2011). Those years transformed bureaucratic institutions into more service-orientated information providers, placing greater emphasis on service quality, transparency, and user friendliness (Lapsley 1999; Osborne 2006). The technological solutions that emerged during this development phase, such as electronically accessible information, citizen requests via email, online reservation of license plates, electronic tax filing systems, and the widely used e-procurement remain prominent but will be overtaken by approaches with a greater focus on (online) participation, collaboration, and integration (Hood 1995; Dunleavy & Hood 1994; Osborne 2006).

This final development stage targets solutions such as increased electronic participation, an internal administration innovation system based on collaborative idea management systems or external citizen consultations (Koch et al. 2014), dialogs, or innovation systems, including social media features (Bowler & Donovan 2000; Dunleavy & Hood 1994). As a consequence, citizens are no longer considered passive stakeholders, but more active and thus enabled actors with different possibilities for participative democratic involvement. As Hilgers and Ihl (2010) wrote, “many public sector innovations and reforms are, then, focused on giving citizens more “customer voice”, more choice, and the service quality they deserve” (Hilgers & Ihl 2010, p.68).

This three-phase approach may also be linked to the underlying logic of different mechanisms of coordination. The first phase was dominated by a strict, hierarchical logic, relying on the development of the justice system, the establishment of a smoothly functioning bureaucracy, and the installation of planning and public steering instruments dominated these decades (Alford 1998). Although the notion of hierarchy remains part of the administration, the more market-oriented notions of “supply and demand” or “contracts” grew in importance (Alford 1998). This

new way of thinking includes the abovementioned aim of transforming bureaucratic institutions into more service-oriented information providers (Pollitt & Bouckaert 2011). Consequently, the dominant concepts are a growing decentralization, greater competition between various public institutions, and finally, an enhanced focus on cost-efficiency, including e-procurement, public mergers and acquisitions and the general trend towards privatization (Public Private Partnerships). The Open Government approach, however, will be built on the basis of a new logic of coordination (Heckmann 2011). Network-related parameters will dominate the future behavior of public institutions. Terms such as trust, knowledge, information, and transparency, and dynamic interactions and social and intellectual capital will be the basic requirements of a successful Open Government approach (Lathrop & Ruma 2010).

2.2. Definition of Open Government

Currently, the term Open Government is an oft-employed term consisting of diverse nuances (Lathrop & Ruma 2010). The scientific, political and journalistic communities employ this concept. Some equate Open Government with *Open Data*. The latter states that citizens have the right to access previously confidential government data, such as healthcare information and train and bus data, to allow for effective public oversight and value creation by reusing and combining the data to develop valuable services for citizens (Huijboom & Van den Broek 2011). The discussion on Open Data focuses more on general availability, critical discussions on the publication of such data sets, required formats, and possibilities for creating added value; Open Data can thus be considered a basic enabler of or data and platform provider for the other aspects of Open Government (Linders 2012).

The second aspect of Open Government refers to the term *Open Information*, which involves proactively releasing information and documents on government activities in a spontaneous and dynamic manner (Linders 2012). This aspect is closely connected to the abovementioned notion of e-Government and exhibits numerous parallels with the increased service orientation of governmental institutions (Bertot, Jaeger & Grimes 2010; Linders 2012).

The third and possibly most important aspect of Open Government may be paraphrased by the term *Open Dialog*, which entails providing citizens with a stronger, more interactive, collaborative, participative and transparent voice in government policies and priorities and expanding points of interaction through Web 2.0 technologies (Buhl 2011). As Open Data and Open Information may be considered the basic requirements of Open Government, the notion of Open Dialog confers the necessary newness and relevance on this concept.

Concerning the overall research aim of this thesis, the aspect of Open Innovation should be considered another dimension of this definition of Open Government. By referring to the

commonly used definitions of Open and User Innovation, we observe structures similar to those identified above (Mergel & Desouza 2013; Mergel & Bretschneider 2013; Brabham 2010). While opening formerly closed innovation structures requires new ways of providing data and information to the external crowd, the main success of Open Innovation can be linked to the inherent aspect of enabling customers and users to engage in more interactive, collaborative, and participative ways of innovating products (Chesbrough 2006; Chiaroni et al. 2010; Dahlander & D. M Gann 2010; Gassmann et al. 2010a). Chesbrough defined “Open Innovation as a paradigm that assumes that firms can and should use external as well as internal ideas, and internal and external paths to market, as firms look to advance their technology” (Chesbrough 2003b, p.25).

In this thesis, the term Open Government includes the ability to actively co-innovate with citizens, to share resources that were previously closely guarded and thus harness the power of mass collaboration, and to drive transparency. Moreover, the term refers to governments’ capabilities to behave not as isolated departments or jurisdictions, but as partially open, interactive, and truly integrated and networked organizations (Lathrop & Ruma 2010).

To effectively exploit the abovementioned IC technologies and leverage the potential of the virtually accessible masses, Open Government platforms or their communities are typically used to enable virtual collaboration. Consequently, we understand OGCs to be online collaboration platforms, on which citizens may register, find information and specific tasks, upload their contributions, and discuss and evaluate existing content. The aim of OGCs is to provide an online setting focused on communication and interaction, in which citizens, public administrators, and politicians can collaboratively gather information, evaluate and discuss existing content or focus on the development of (new) ideas, concepts, and best practices (Lee et al. 2012).

2.3. Enabler of Open Government

Obama’s call for a more transparent, interactive, collaborative and, thus, more modern way of integrating citizens into the formerly closed processes of policy development has found numerous pioneers and supporters in other countries (Obama 2009). The current success of Open Government activities, however, relies not only on certain motivated politicians, but rather on four enabling factors or boundary conditions, which can be regarded from a technological, societal, economic or demographical perspective and is introduced below.

2.3.1. Technology-related drivers

ICT such as social media solutions, wikis and various topic-oriented online groups and forums and mobile applications offer rapid access to a large crowd of creative minds at low cost and on a global level (Piller & Walcher 2006b). At their core, social media are based on participation, openness, conversation, community, and connectedness, allowing any internet user to create and

exchange his or her own content (Kaplan & Haenlein 2010). These features support large-scale communication, information sharing, and support the mass-coordination of largely un-organized actors or among individual citizens. Social media also provide a technological platform to rapidly gather and integrate knowledge from widely dispersed and formerly unconnected groups. Social media have played an important role in transforming the contemporary notion of what is ‘public’ and ‘open’ and what is ‘private’ and ‘closed’ and are able to leverage the internet’s potential for the creation of more democratic media spaces (Dahlgren 2009; Papacharissi 2010). As Coleman and Ross (2010) argue, this effect is due to five aspects (Coleman & Ross 2010):

- Digital media have reduced the monopoly of knowledge production and distribution and created an abounding information and communication environment;
- Digitization has offered the broad public a vast variety of sources of media content, which is both affordable and easy to use;
- The formation of complex and widespread communication networks has been rendered an exceptionally easy task via digital media;
- A new, interactive model of communication is now available alongside the traditional broadcasting models; and
- A new media space is available to citizens in which they can exchange opinions and produce new meanings.

Additionally, results from the field of computer science have revealed that these technologies enable individuals to engage in activities that allow them to learn and practice skills in different fields, secured by a rather nonthreatening environment (Amichai-Hamburger et al. 2008). The technology enables us to identify, recruit, communicate and, finally, distribute political decisions in a targeted, effective and dynamic manner (Buhl 2011; Thomas 1995; Di Gennaro & Dutton 2006).

2.3.2. Society-related drivers

The societal perspective may be considered a second enabler of the Open Government paradigm. Encouraged by the abovementioned technology, new forms of personal interaction, communication, and collaboration are currently in widespread use (Bekkers 2007). The emerging online communities are settings in which citizens participate in discussions, and their goals include attempts to inform and influence fellow citizens concerning products, decisions, individuals, brands, or political decisions (Kozinets 2002). From a network theoretical perspective, we know that individuals currently gather into virtual interest groups; these may include different political interests, hobbies, industries, or products. These virtually visible

friendship- or interest-based network structures offer numerous information sets, which may be used to extract relevant information on consumers' or citizens' behavior and needs. As a consequence, in their private lives, (Western) citizens are more familiar with dynamic, interactive, transitory and mobile communication systems (Kaplan & Haenlein 2010) and thus expect similar applications in the political environment.

2.3.3. Economy-related drivers

Williamson's early work has already been extended through a greater consideration of various hybrids between markets and hierarchies and initiated a debate on the boundaries of the firm (Williamson 1991). Langlois (2003) argued that managers must find new ways to conceptualize the 'post-Chandlerian firm' in which innovation proceeds in a less hierarchical manner because "large vertical integrated organizations are becoming less significant and are joining a richer (Chesbrough et al. 2006; Von Hippel 2005) mix of organizational forms" (Langlois, 2003, p. 353). Beyond those theoretical considerations, the successfully applied concepts of Open Innovation, co-creation, mass customization and crowdsourcing have questioned the traditional definition of organizational boundaries. Nearly every global player, in addition to small and medium-sized firms, agencies and consultants, claims to be opening up the closed processes of idea generation, concept and prototype development, and testing and promotion to external carriers of knowledge and experience (Chesbrough et al. 2006; Von Hippel 2005). This trend need not be exclusively considered from a corporate perspective because consumers and users have effectively claimed new ways of participation and integration (Füller et al. 2004; Franke & Shah 2003b). The need for greater openness has changed the behavior of existing firms and enabled the emergence of new market players that exclusively rely on completely new and more user-focused business models (Osterwalder et al. 2005; Rajala & Savolainen 1996; Feller et al. 2011).

2.3.4. Demography-related drivers

The fourth enabler may be defined as a demographic perspective. Compared with previous generations, persons from ten to thirty years of age have developed completely new user behavior, which was primarily developed in a digital environment. Digital Natives have grown up in the digital world, using technology as a way to communicate, record, educate, and understand society (Howard 2010; Bennett et al. 2008; Prensky 2009). However, even the older generation, often termed digital immigrants, who became fascinated by new possibilities and adopted many aspects of new technology, must be considered a rapidly growing group of individuals with digital affinities (Prensky 2009). This development is accompanied by new demand attitudes regarding communication behavior, the quality of data and information provided, appropriate frequency, accessibility, and, for instance, communication channels and the possible means of participation

(Buhl 2011). Thus, a member of the digital society no longer understands itself as a passive information receiver but more as an active and emancipated actor on the global playing stage (Kaplan & Haenlein 2010; Di Gennaro & Dutton 2006). In the past, politicians and officials were reluctant to apply ICT. Currently, we observe increasing interest in and adoption of these technologies and media.

3. Open Government – theoretical perspectives

Scholars studying online dialog portals, political blogs and forums and interactive discussion platforms have faced the challenge of selecting appropriate theoretical foundations on which to ground their methodological approaches and interpret their findings. Therefore, the following chapters serve as the central component of the synopsis and introduce various theoretical perspectives, which may help understand, evaluate, and possibly challenge the different empirical studies and thereby develop a theoretical framework for Open Government. To create a holistic picture of relevant theoretical considerations, the research topic of “Open Government” is addressed from five different theoretical perspectives: a (1) democracy, (2) public administration (3) political communication, (4) community, and (5) a technology perspective, as graphically depicted below:

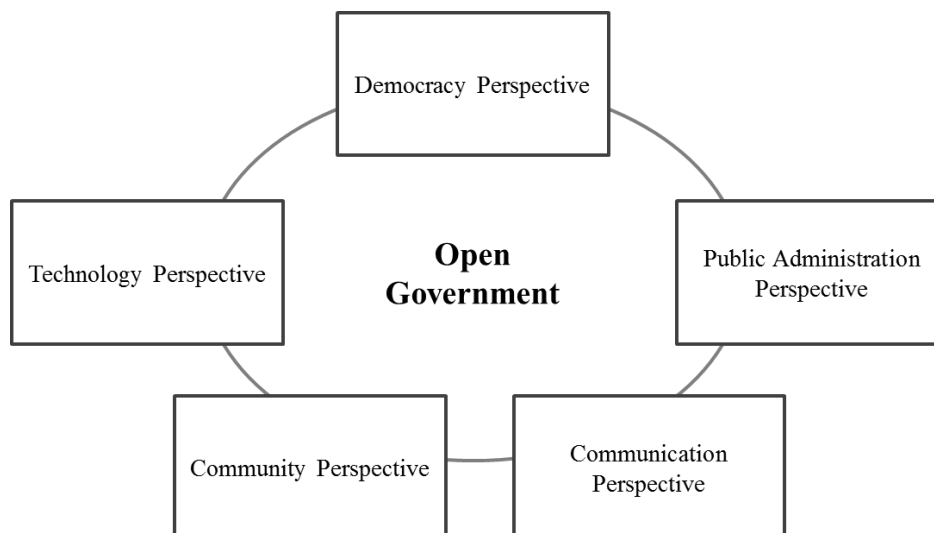


Figure 2 Open Government – Theoretical Perspectives (source: own description)

3.1. Open Government from a democracy perspective

John Dewey, the American philosopher, stated that democracy begins with conversation (Wright & Street 2007); alternatively, Hill and Hughes remarked that discourse is the heart of democracy (Hill & Hughes 1998). In the same vein, Corrado and Fireston concluded that online discussions creates a “conversational democracy” in which both citizens and political leaders meet in new (online) and existing (offline) ways (Corrado et al. 1996). As Wright and Street summarized in their article on democracy, deliberation and design, “all of these claims reinforce Dyson’s famous soundbite that the ‘Net will foster activity rather than passivity’ (Dyson & Stewart 1999, p.36)

and that it will promote the development of more democratic forms of government where citizens will be able to develop a more meaningful voice in their government” (Wright & Street 2007).

Following the actual debate on democracy, the discourses of scientists, journalists and politicians also identified serious problems regarding the legitimacy of democracies (Freelon 2010). The main reasons seem to be (1) the increasingly dominant role of mass and online media, and (2) the erosion of traditional class structures and the struggles faced by economic systems, especially in Western countries (Sorensen 2002; Habermas 2006). The main conclusion is that contemporary politicians experience serious difficulties in satisfying the extremely high expectations established by society and building a credible and lasting relationship with their voters (Howard 2010; Buhl 2011; Sorensen 1997). The society that emerges from this process of change is characterized by numerous, interactive functional systems with fuzzy boundaries, a multi-centered system of governance, and a highly dynamic mode of interaction, all of which imply a loss of political power and leadership from the perspective of the state (Sorensen 2010). Because the election of powerless politicians is, by definition, rather senseless, the main reason for the abovementioned challenges of democracy (e.g., the problem of legitimacy) can be found in the number of unresolved approaches to enabling more effective public empowerment (Habermas 2006). To conclude this paragraph with the words of Eva Sorensen, “the task is to develop new institutions of democratic governance to ensure, for example, that political power is kept in the hands of the people, in a multi-centered and borderless society” (Sorensen 1997, p.554). As some type of empowerment might be established through modern methods of interactive and rather collaborative online participation, the following general thoughts from a democracy perspective seem to be necessary given our research framework.

3.1.1. Aggregative theories of democracy

A number of aggregative and integrative theories of democracies exist that shed light on the duties and challenges of a democracy. Aggregative theories share the assumption that individuals have certain preferences and interests that change little during the political discourse (Habermas 2006). Thus, society is regarded as a gathering of atomized individuals and an accumulation of various views and interests. Consequently, conflicting views and interests between the individual and collective governance may arise within a democracy (Sorensen 1997). While democracies seek to provide individual freedom, they represent the interests of the majority. These sometimes conflicting goals may lead to negative liberty (Berlin 1969) and, in the worst case, a tyranny of the individual and small groups (Olson 1965). According to this perspective, democratic institutions must possess the ability to aggregate a plurality of views and interests to govern, distribute influence, and regulate conflict.

3.1.2. Integrative theories of democracy

Integrative theories of democracy focus on an institution's ability to shape democratic citizens. Integrative theories assume that individuals are able to suppress their own interests and views in the democratic decision-making process to promote the common good for society as a whole (Mill 1954). Citizens are considered to possess the social resources and intellectual capabilities that are necessary for democratic participation (Pateman 1989). In this sense, society is an "imagined community, more than the sum of pre-given preferences of atomized individuals" (Sorensen 1997, p.555). Integrating individuals into the collective decision-making process and engaging them in democratic processes, for example, through elections, referenda, direct access and discussions with politicians, and offering them the possibility to publically follow the political discourse are considered suitable means to shape democratic citizens. Simply having the ability to participate may provide a sense of psychological empowerment, which leads to better understandings and a holistic view of the issues facing a democracy (Bucy & Gregson 2001).

Despite the possibility of active participation, certain individuals may nevertheless disagree and be dissatisfied with political decisions. Citizens may adopt the strategies of "exit" and "voice", which feature prominently in the literature (Hirschman 1970). They may exit a certain party or interest group once they feel that they are not well represented and vote for another, provided that alternatives exist. However, they can also give voice to their concerns, for example, by voicing their disagreement on the internet, writing complaints, or expressing public criticism. While exit is a powerful strategy to demonstrate dissatisfaction and strengthen one's feeling of autonomy, it has little impact on the governance model. In contrast, citizens may significantly challenge democratic institutions when taking opposition in public and organizing fierce resistance.

3.1.3. Theory of empowerment

In the context of the traditional political studies, the construct of empowerment is operationalized through citizen participation (Sorensen 2010; Bucy & Gregson 2001). Whereas the past discussion on political or participatory empowerment primarily focused on real-life participation and thus concerned a rather passive or at least indirect mode of participation, more recent research now considers more active and thus direct participation modes, supported by New Media, Social Media, and the respective networks (Bucy & Gregson 2001). Consequently, the internet can be understood as a modern enabler of (citizen) empowerment, primarily through two processes (Wright & Street 2007): (1) the reframing of one's identity, by interacting with others, role-playing, learning of and testing one's own social and political skills, and (2) increasing self-efficacy and skills. Research in the computer sciences has demonstrated that the Internet enables individuals to engage in activities that allow them to learn and practice skills in a nonthreatening environment, meaning that the psychological cost of failure is much lower than in offline

environments (Amichai-Hamburger et al. 2008; Füller 2010). As Sorensen puts it, “in a predominantly integrative theory of democracy, empowerment means transforming individuals into citizens; that is, increasing the ability of each individual to internalize a holistic perspective on societal governance and to develop their political as and social/intellectual capacities” (Sorensen 1997, p.557).

3.1.4. Résumé on democracy approaches

Because citizens are considered to possess the social resources and intellectual skills necessary for democratic participation, their development may be achieved by providing constant opportunities for participation to enhance citizens’ social and political capacities (Pateman 1970). Open Government offerings may afford citizens the necessary collaboration and learning environment. Platforms may allow citizens to increase their general understanding of and the capabilities required to participate in political decision making, with its consequences on democracy, the political system, and society (Bucy and Gregson 2001). Moreover, such a learning environment may increase their civic engagement and sense of political influence (Nam 2012). In summary of the considerations presented on the democracy perspective, the concept of Open Government, with its different dimensions of virtual, integrative, and collaborative modes of participation, seems to have the potential to contribute to addressing some of the current challenges of democracy, which were identified at the beginning of this chapter (Davis 1989; Freelon 2010).

3.2. Open Government from a public administration theory perspective

To supplement the abovementioned considerations, the following paragraph provides theoretical approaches from the field of public administration research. These insights may help better understand and approach challenges and potential fears within the administration and offer opportunities, methods for the successful implementation and future potential of more open and dynamic Open Government activities (Neshkova & Guo 2011).

3.2.1. The tradition of public administration research

Approaching the research field of public administration from a contemporary perspective, one might arrive at the misleading assumption that this research stream was a clearly distinct research field in recent decades (Scharpf 1973). However, the field of public administration has its historical roots in political science, governance and policy research and in neighboring fields such as constitutional law, political economics, and sociology (Bogumil & Jann 2005). Early researchers in public administration management adapted a number of general management functions to the actual needs of a public organization (Gulick 2003). These include (1) *planning*, understood as the ability to successfully develop, plan and implement target-orientated strategies

within a bureaucratic organization; (2) *organizing*, interpreted as the development of formal structures of authority, working units, and their successful coordination with respect to the existing strategy and defined goals; (3) *staffing*, defined as the active recruitment of potential officials, their continuous training, and the guarantee of adequate working conditions; (4) *directing and steering*, understood as the ongoing process of decision making and the ensuing implementation, alternatively realization due to ad hoc instruction; (5) *coordinating*, interpreted as the ability to link different working units to one another during the working process; (6) *reporting*, defined as the recurring preparation of required information for both the superior authority and subordinates; and (7) *budgeting*, understood as the planning, allocation, and control of financial resources (Bogumil & Jann 2005).

The list of planning, organization, leadership and control remains an important aspect of administrations' daily work and self-understanding, although the general working environment has added further functions to an administration's "product and service portfolio" (Neshkova & Guo 2011). In any case, the abovementioned dimensions of administrative functionalities imply immense potential for more open and integrative forms of citizen integration. These forms do not apply only to mutual policy development but also to crowd-sourced or co-created ideas or problem/solution contest to further co-innovate in the context of administrative structures (Tolbert & Mossberger 2003). This is analogous to the well-documented enhancement of Open Innovation approaches, from co-created innovation and product developments to the systematic integration of external and internal knowledge and experience into further developments of organizational and institutional structures (Ebner et al. 2009; Gassmann et al. 2010b; Dahlander & D.M. Gann 2010).

3.2.2. *Role and understanding of administrative functions*

Many actors have a rather instrumental understanding of public administration, which implies that the administration is not an autonomous actor, but merely an instrument dependent on the executive institutions (Scharpf 1973; Bogumil & Jann 2005). This perspective arises from traditional juridical argumentation, in which the administration serves "only" as an efficient and incorrupt instrument to successfully administer law and order (Jenks & Wright 1993). However, this rather narrow perspective has been supplemented by new roles and a more modern understanding of administrative functions (Christensen & Laegreid 2001). The following list of arguments helps better understand the modern interpretation of a public administration and simultaneously offers some very important indications of why and how Open Government approaches might support the bureaucracy (Vigoda 2002).

(1) *Formulation of policy*: the assumption that policy is primarily formulated by politicians or the government and subsequently implemented by the administration must be considered outdated. Contemporary administrations play a decisive role in formulating policies (Svara 2001). The oft-

cited phrase “dominance of the administration” is especially obvious in the process of preparing legislation and negotiations during the budget planning process, in which modern administrations play an important role (Skok 1995).

(2) *Interpretation of policy*: because bureaucracies are very difficult to control through an existing body of law alone, the administrations involved are typically confronted with a wide scope of possible actions when implementing policies (Svara 2001).

(3) *Interest groups*: although lobbyists, interest groups, and experts typically enjoy strong relationships with politicians, the most valuable connection is attributed to the administration, which is involved in the planning, preparation, formulation and the implementation and control phase of the legislative process (Golden 1998). Thus, from an administrative perspective, systematic professionalization at the personal level and increased interest intermediations can be observed, representing efforts to handle and process the necessary information (Schnapp 2004).

(4) *Policy implementation*: Due to the abovementioned transformation of the administrative structure, the process of policy implementation is no longer particularly lean or unexceptional. New demands from various stakeholders such as citizens, politicians, interest groups and the media have added complexity to the system and transformed policy implementation into a separate political process (O’Toole 1997). This includes the need for additional discursive elements, an autonomy of decisions, and thus a more dynamic and more spontaneous administration (Svara 2001). In this context, researchers often refer to a “cooperative state” or “cooperative administration” (Meijer 2011).

(5) *Networks as a new mechanism of coordination*: The final argument concerning a more complex, functionally subdivided and virtually interconnected environment is likely the most important one (Provan & Milward 2001). The actual transformation of the mechanism of coordination from hierarchical to market and prospectively rather network-oriented logics gives rise to complementary interpretations of administrative roles and functions (Scharpf 1973).

3.2.3. *Résumé on public management approaches*

When summarizing the arguments from a public administration perspective, the most obvious shift in the general development the administration lays in the object of analysis. Whereas traditional research has primarily focused on the administration itself, many recent perspectives on public service provision have focused on the relationship between citizens and the government, referring to the basic understanding that government officials need to provide support for public services (Meijer 2011). However, this perspective nevertheless fails to acknowledge that digital citizen or expert communities can also play a role in providing public service support (Alford 1998). Thus, the focus on citizen-to-citizen interaction substantially shifts attention away from the

administrative institution to the citizen networks surrounding it (Pestoff 2006). The abovementioned functions and tasks of a modern administration should not be dependent on the internet, but digital, and thus more interactive, media will create new means and opportunities to better (in terms of efficiency and efficacy) identify, plan, develop, provide, and control public service support (Bovaird 2006). Existing approaches to and tools of Open Innovation may thus also be applied in the context public administration (T. Brandsen & Pestoff 2006). These include idea, suggestion and best practice consultation with citizens, or more expert-focused “Lead-Citizen-Workshops”¹, and Online Dialogs or Online Consultations, which focus on the mutual development or improvement of strategies and legislative texts. Those more open approaches and tools may provide a rich source of information for public administrations to prepare their structures to meet future challenges. The words of Meijer (2011) serve as an appropriate conclusion to this chapter: “virtual citizen communities have come to play an increasing role in contacts between administration and citizen. The networked character of the new media forms an impetus to change government-citizen relationship, and will foster both the exchange of information and social-emotional support” (Meijer 2011, p.606).

3.3. Open Government from a political communication perspective

The following chapter briefly introduces theoretical considerations on the (mass) media system and its interdependence with the political system (Mazzoleni & Schulz 1999). The fundamental functions and concepts of the media reality and the possible impact of the mass media are discussed against the background of the emergence of the internet, social media and thus more participative means of communication (Berry & Moss 2006). The aim is to derive insights on how OGCs might influence the traditionally established “melange” of politicians, journalists, and their communication channels (Benlian & Hess 2011). Political processes, decisions, and particularly, events do not typically appear in societal perceptions by accident (Robinson 2001). Instead, political actors actively cooperate with various media partners to render an event or decision as prominently as possible or, alternatively, conceal it (Stefanone et al. 2010; Walgrave 2008). This liaison is the why researchers refer to the fourth estate within a democratic state, in addition to the executive, legislative and judicial authorities, when discussing the role of the mass media (Mazzoleni & Schulz 1999). In many Western democracies, we observe a tightly bounded network of structures between the political and media systems, in which dependencies,

¹ Eric von Hippel coined the term "lead user" in 1986 to refer a specific type of user of a product or service who has two characteristics: (1) He or she is at the leading edge of important market trends and (2) has a strong incentive to find solutions for the novel needs they encounter at the leading edge. Due to these characteristics, works by numerous scholars have repeatedly shown that: Lead users themselves often have to develop the new products and services they need - they become user-innovators; the products that lead users develop often form the basis for important commercial products when lead user needs become mainstream (Von Hippel 1986; Franke et al. 2006; Lüthje et al. 2005).

exploitation, and interdependencies may occur (Newton 2006). The scientifically discussed thesis of dependence refers to the fact that the mass media is obviously dependent on the information, political events, and intrigues provided by the political system (Mazzoleni & Schulz 1999; Robinson 2001). Conversely, one could argue that political systems somehow exploit the media to “sell” their decisions. Offering an intermediate argument, the thesis of interdependence describes the co-existence of the two systems, including their mutual linkages (Mazzoleni & Schulz 1999; Newton 2006; Stefanone et al. 2010).

3.3.1. *Media functions*

Following Donohue et al. (1973), the media system typically needs to fulfill the following six media functions, supported by the political system (Donohue 1973):

- (1) Create the *public sphere* by covering different topics in appropriate forms, characteristics, and channels to reach the different levels of the public sphere;
- (2) The *allocation* of validated, enriched and interpreted *information*. Researchers differentiate between the input and output perspectives. The input perspective concerns the delivery of new (background) information and the potential relationships thereof. The output perspective, however, understands the mass media as a platform for other actors broadcasting their information;
- (3) The third function seeks to *control political processes* by actively scrutinizing statements or providing other actors (NGOs, interest groups or affected groups) with a well-positioned stage through which to communicate their perspectives;
- (4) The mass media may also enable *political socialization* and integration by communicating societal norms and rules;
- (5) Moreover *political education*, including political and social skills, should be supported by media systems by providing information on political structures (polity), political processes (politics) and political content (policy);
- (6) The final function concerns the generation of *public opinion and knowledge*. Consequently, the media system is encouraged to provide comprehensive information, different positions and analysis to enable the citizens to form their own opinions.

These media functions seem to substantially overlap with respect to the above-characterized theoretical dimensions of democracy. Due to the close interconnections between these two systems and the mass media’s crucial role as an intermediary, the Open Government approach can only be successful if both systems pursue the same, or at least a similar, goal (Hove 2008). This implies that more participative means of communication between citizens and the state will

have the potential to change not only the interaction between those two systems but also the self-understanding of the media system (Mazzoleni & Schulz 1999). Consequently, the following paragraphs introduce relevant theoretical approaches from media research and discuss possible changes due to the increased potential for online participation.

3.3.2. Media reality

The concept of media reality may be considered an important instrument to analyze and understand both the potential and possible risks of Open Government activities. From a theoretical perspective, media reality can be divided into a direct media reality and an indirect (mediated) media reality. The latter implies that information or events are generally communicated via a mediating agent and thus are never verifiable directly, but only via (professional) gate keepers such as journalists (Mosler et al. 2001; Chesebro 1984). In modern democracies, citizens typically rely on this indirect media reality, independent of the communication channel (print, television, radio, or online). Even the (new) phenomenon of social media has not fundamentally changed this structure. Modern communication channels have added new players to the game (users, readers, citizens), which now publish their user-generated content and have increased the pace of the circling process. The basic operation of the media reality is thus not particularly affected and persists. Consequently, the well-known statement made by the central author in this field of research, Harold Lasswell, “who (communicator) says what (message) in which channel (medium) to whom (recipient) with what effect (consequence)” may still be applied (Lasswell 1948).

3.3.3. Media consequences

The potential impact of the (mass) media on the recipient occurs in the moment at which the latter consumes the information. The possible effect can be threefold. First, it may influence the knowledge structure of the recipient. Second, it may affect the attitude or mindset of the recipient, which is considered to be “more” than a simple increase in the knowledge base. Finally, the consequences of media use may be reflected in changes to the recipient’s behavior. Thus, the theory of media consequences helps elucidate the potential impact of Open Government projects as a new means of collaborative communication. The stimulus-response-model is the basic approach, which implies that the messages will influence the knowledge, attitudes, and behavior of the recipient (Bonfadelli 2002). Bonfadelli adopts a communication science perspective and describes four different levels: first, the cognitive level, where the media actually influences perceptions of reality; second, the attitude level, where existing settings are challenged and possibly altered; third, the affective level, where emotional effects are triggered by arriving messages; and finally, the social level, where Bonfadelli connects the decoded message to the social setting of

the recipient, to develop an affiliation with a social group or (cultural) identity. In this theoretical setting, all communication activities seem to be treated similarly, independent of the actual communication channel (print, television, radio, online or even Web 2.0) or group of recipients addressed (Bonfadelli 2002).

From a psychological perspective, research has shown that the potential impact of messages is based on changes in the recipient's attitudes. The consequential Elaboration-Likelihood-Model demonstrates that a high degree of consternation on the part of the recipient leads to an increased motivation to decode the arguments cognitively (Mosler et al. 2001). Central to this model is the "elaboration continuum", which ranges from low elaboration (peripheral path) to high elaboration (central path), where a high level of cognitive involvement is typically observed. For the message to be centrally processed, a person must have the ability and motivation to do so (Petty & Petty 2001). The two factors that most influence the route that an individual will take in a persuasive situation are motivation and ability (Petty & Wegener 1999). Ability factors include the availability of the cognitive resources or relevant knowledge necessary to carefully scrutinize the arguments (Petty et al. 1976).

Whereas the past discussion on political or participatory empowerment primarily focused on real-life participation and thus concerned a rather passive or at least indirect participation mode, the discussion in more recent research considers more active communication modes, supported by Social Media (Bucy & Gregson 2001). Arguing from a network theoretical perspective, social networks are characterized by interest- and ability-driven clusters of like-minded persons who constantly communicate interactively. This "environmental setting" enables the sender of a message to actively target the relevant group and simultaneously profit from existing topic-related ability within the community, which will encode and process his message. This will, at least theoretically, reduce the scattering effects and increase the potential for an output-oriented and similarly efficient and effective communication process (Pasek et al. 2006).

From a sociological perspective, some researchers have questioned the powerful position accorded to the mass media. They demonstrate that only a very small group of persons actually seem to change their attitude towards a specific situation or their behavior due to a media-communicated message. The hypothesis postulating a two-step flow of communication must be assigned to this category (Lazarsfeld et al. 1948). These researchers expected to find empirical support for the notion that media messages have a direct influence on voting intentions (DeFleur 1998). However, their findings revealed that informal and personal contacts were mentioned far more frequently than exposure to radio or newspaper as influencing voting behavior. This theory asserts that information provided by the media moves in two distinct stages (Katz 1957). First, individuals (opinion leaders) who pay close attention to the mass media and its messages receive

the information (Weimann & Brosius 1994). Opinion leaders pass on their own interpretations in addition to the actual media content. The term ‘personal influence’ was coined to refer to the process intervening between the media’s direct message and the audience’s ultimate reaction to that message (Case et al. 2004). Because opinion leaders are considered quite influential in persuading individuals to change their attitudes and behaviors and are quite similar to those they influence, convincing those gate keepers appears essential (Pasek et al. 2006).

3.3.4. Résumé on politics and mass media

Social networks, blogs, and forums are characterized by interest- and ability-driven clusters of like-minded persons who constantly communicate interactively (Benlian & Hess 2011). Furthermore, social networks and related online communities are not as egalitarian as is often expected. In reality, an online community is a very hierarchical and strict organization with given roles, in which a small number of participants (opinion leaders) have enormous power (Hutter et al. 2011). However, this power exclusively rests on relevant experience and knowledge and can therefore easily change. Thus, the abovementioned theory of the two-step flow process may help explain why political messages can be communicated very precisely within the world of social networks. Individuals tend to follow opinion leaders within the mass media, such as bloggers, forum providers, and online journalists, by reading, commenting on, and sharing their articles or blog posts. Because those opinion leaders are by definition “equipped” with a large crowd of like-minded community members, the sender of a certain message (e.g., politician, public institution) has the opportunity to send his messages in a highly targeted way and reach the underlying crowd while utilizing the credibility of an opinion leader. Summarizing the chapter on mass media theories, Open Government projects may influence the traditional portfolio of media channels and their traditional operation. As Open Government projects are typically accompanied by social media channels, all of the communication aspects of Open Government should not be underestimated on a general level and should be understood as an additional channel of modern and targeted communication.

3.4. Open Government from a community-oriented perspective

Considering the enablers of Open Government introduced above, the phenomenon of (online) communities clearly plays a very important role in the context of Open Government. Political engagement is typically understood as individual or group-related political activities in the real world, which take various forms such as attending public meetings, writing letters to officials, participating in political rallies and speeches, and participating in community groups (Houston & Walker 1996; Zaichkowsky 1994). At present, political online platforms provide an additional

channel for, e.g., advancing ideas, concepts and political positions or efficiently mobilizing individuals around a currently relevant topic (Rogers et al. 1994).

3.4.1. Definition of online communities

Online communities may be defined as aggregations of like-minded persons with similar interests who virtually interact on the internet, for example, to exchange experiences, discuss certain points of view, or create common visions (Von Hippel 2001). Shared consciousness of kind, rituals and traditions, as well as a sense of moral responsibility, weld groups of individuals together and are the primary constituents of a community (Muniz & O’guinn 2001). Collectively shared experiences allow meanings to be affirmed, evoked, assigned, or revised and tribal memberships to be formed (Cova & Cova 2002). Thus, while members of virtual communities are typically geographically dispersed, they exchange their interests in the internet space and share common socio-cultural properties, i.e., shared values, protocols and norms developed through the interaction among members. Evidently, a certain behavioral codex developed in a community may exert normative pressure upon its members to effectuate (or not) certain behaviors. Kozinets (1999), for example, defines four types – tourists, minglers, devotees and insiders – according to their consumption activity and relationship to the community (Kozinets 2002). As different user types are found to differ in the type and quality of their contributions in creating, shaping, and disseminating Open Government activities, such theoretical concepts might help successfully manage OGCs.

From a managerial perspective, distinguishing between various user roles may provide guidance for the design of appropriate rewards and incentives, thereby enabling governmental institutions to successfully implement Open Government platforms. Because Open Government platforms have the potential to be misused by radical groups, egoistic individuals, or “mere” interest groups, it might also be helpful to identify corruptive behavior on participatory online platforms. A rich body of research on various forms of online communities (Franke & Shah 2003; Füller 2010; Nambisan & Baron 2010) identifies a number of motives explaining why consumers engage in diverse value co-creation activities. For example, consumers may engage in virtual new product development for several reasons; in addition to intrinsic interest, Füller (2010) identifies dissatisfaction with existing products, gaining knowledge, sharing ideas, curiosity, and receiving monetary rewards (Füller 2010). Recent studies not only focus on the individual motivational aspects that lead individuals to engage in co-creation activities but also relate these to the contribution context, behavioral patterns, personal values and personal attributes or to the characteristics of the individual contributor such as skills or expertise (David & Shapiro 2008; Oreg & Nov 2008; Nambisan & Baron 2010; Kozinets et al. 2010; Jeppesen & Frederiksen 2006).

3.4.2. Communities of practices

As Open Government is not always focused on the quantity of the potential addressees but may also focus on a selected group of knowledgeable citizens within a semi-open environment, the existing knowledge on communities of practice may offer valuable insights for the understanding and use of communities in the public sector. The existing knowledge creation literature on communities of practice offers further insights into how online communities may operate (Franke & Shah 2003b; Sawhney et al. 2005). Typically, members of communities of practice have established a continuous mode of interaction and communication. Members of such communities of practice discuss their work, pose questions, raise problems, offer solutions, develop answers, and laugh at mistakes or discuss changes in their work (Brown & Duguid 1991; Wenger 2004). The underlying logic of these activities is the goal of keeping one another informed of state-of-the-art knowledge, relevant learning, and resulting actions (Brown & Duguid 1991)

At the individual and group levels, this interaction with the corresponding aim of knowledge creation is of central interest and can be analyzed using psychological theories. For example, transactive memory theory appears especially promising in this context (Von Hippel & Von Krogh 2006; Brandon & Hollingshead 2004; von Hippel et al. 2009; Wegner 1987; Brandon & Hollingshead 2004). The transactive memory theory is based on the notion that individuals may serve as external memory support to one another's "knowledge storages" (Wegner 1987). Members who are part of the respective knowledge networks are able to benefit from one another's knowledge and expertise, assuming that there exists a shared understanding of the terms involved and who knows what within the group. The available information, external data and analysis, experiences and the interaction with others can be interpreted as locations of external storage for individuals, which again help the individual arrive at a decision or an estimation or to access know-how, which would not have been accessible by the individual in isolation (Moreland & Myaskovsky 2000; Wegner 1987; Lewis 2003; Hollingshead & Brandon 2003).

3.4.3. Online innovation communities

'Online innovation communities' are understood as a virtual assembly of different types of experienced users, who initially contribute, discuss and further develop ideas, concepts, and inspirations for new product development. This phenomenon has attracted considerable interest in both research and practice (von Hippel 2006; Von Krogh & Von Hippel 2006). Referring to the research of Hutter et al. (2011), this subject can be theoretically founded on different perspectives such as open-source projects (Lakhani & Wolf 2005; Nov 2007; David & Shapiro 2008; Oreg & Nov 2008; Schroer & Hertel 2009), virtual communities of practice (Ardichvili et al. 2003; Daugherty et al. 2005; Ardichvili 2008), and user innovation communities and virtual consumer integration (Hemetsberger 2002; Franke & Shah 2003b; Füller 2006). Hemetsberger and

Reinhardt (2006) note, for instance, that most communities in the free and open source software context exhibit such characteristics: members feel very close to the group, responsible for other members and share common rituals and traditions (Hemetsberger & Reinhardt 2006; Hemetsberger & Reinhardt 2009). While innovation community research, for example, often refers to information products such as open source software, books, reports or other electronically deliverable, knowledge-based products or digital good, they are not restricted to such products.

3.4.4. Online brand communities

Because Open Government communities may be positioned between innovations and communication-oriented communities, the marketing and brand perspective seems relevant. In marketing, the emerging phenomenon of consumption and brand communities has led to a vivid body of research investigating these new forms of community. The notion of consumption or brand communities emphasizes the subject of consumption as part of a special celebration, ritual or tradition (Muniz & O’guinn 2001). The technological advances in ICT and, especially, the new, more interactive logic of Social Media may be interpreted as an increasingly used catalyst for exchanging and spreading communication surrounding consumption activities. The emerging online brand communities are settings in which consumers participate in discussions, the implicit goals of which include attempts to inform and influence fellow consumers of products and brands (Kozinets 1999). Because we know that recommendations emerging from a community of like-minded persons or even friends are perceived as much more trustworthy, this new phenomenon has a considerable impact on future marketing and marketing activities. For marketers, increasing consumer activity on the Internet and in online communities is especially relevant, as consumer advocacy seems to be the major factor influencing positive brand equity (Almquist & Roberts 2000; Berthon et al. 2008; Pitt et al. 2006; Schouten et al. 2007). Consequently, firms increasingly rely on such online brand communities and simultaneously use user-based tester and promotion campaigns to leverage the power of “word of mouth” and thereby increase sales figures.

Transforming this theoretical perspective into a public perspective offers numerous interesting points of departure. The basic perception is that Open Government activities should be understood as both integrating citizens into the problem-solving and idea-generation process and involving them in the communication and “selling” process of settled political decisions to a greater extent. Because public administration activities are largely understood as policy implementation tasks, the sales and marketing perspective is of substantial importance. The abovementioned new demands from different stakeholders such as citizens, politicians, interest groups and the media might be successfully addressed by integrating citizens into the policy implementation process (O’Toole 1997). This could lead to more discursive elements, greater decision-making autonomy, and thus a more dynamic and spontaneous administration (Svara 2001).

3.4.5. *Résumé on politics and community theories*

Understanding the basic functioning of communities is also worth considering in the political context. The analysis provided strong evidence that the underlying functions of (virtual) communities of practice, innovation, and brand communities at least share similar patterns and structures. In addition to communication-related aspects, research on online discussions within the political context has focused on its potential to contribute to democracy-enriching communication (Dahlgren 2009). For instance, Freelon (2010) introduced new dimensions to further explore online communities in the political context, which clearly correspond to the abovementioned characteristics of other online communities (Freelon 2010).

(1) The dimension of *ideological homophily* proposes that citizens tend to assemble themselves into politically homogenous collectives that rarely engage with external groups. This implies that online political groups and forums should not be considered an objective and unitary democratic ideal, but rather an interest-driven crowd of link-minded individuals. Consequently, Open Government communities, at least if they claim to provide a meta topic that, at least potentially, addresses a representative sample of citizens, should recruit participants from different groups, forums and social networks.

(2) *Mobilization*: Mutz (2002) states that members of online political communities should be easier to mobilize for political action compared with citizens who are not “organized” into political interest groups (Mutz 2002). Because the concept of mobilization is closely connected to the concept of political engagement, which has often been construed as political activities in the real or online world (Houston & Walker 1996; Zaichkowsky 1994), this conclusion seems reasonable. Politically interested citizens need a communication channel to achieve their political aims. Online political platforms provide an additional channel for those citizens to, e.g., advance their ideas or efficiently mobilize around a currently relevant topic (Rogers et al. 1994).

(3) The dimension of *community identification* is considered another important theoretical dimension when analyzing online communities, including in the political sphere. Community members who identify themselves with the community typically exhibit strong passion for their content-related topics (Kozinets 2002; Muniz Jr & O’guinn 2001).

These insights allow us to profit from the rich body of existing literature on online communities and apply it in the context of public online participation. In general, Open Government activities must consider the peculiarities of online communities and address them in a targeted way. This may include the identification of the appropriate communities, the processes of communication, recruiting and mobilization, the active formation of the necessary roles within the community, the provision of related incentives, and finally, fair treatment during the process. If the political system considers these community specific rules, virtually assembled like-minded persons ca

represent a valuable source of creativity, ideas, concepts, and innovations that have to be systematically integrated into the traditional policy development process.

3.5. Open Government from an technology/tool-oriented perspective

The emergence of Open Government activities is closely connected to the triumphal march of new technologies and interactive tools (Piller & Walcher 2006a).

3.5.1. Technology acceptance model

The technology acceptance model (TAM) introduced by Davis has been developed to predict the adoption of technologies (Davis 1985; Davis 1989). The TAM posits that the intention to adopt new technologies depends on attitudes towards its use, which in turn can be interpreted as a function of its perceived usefulness for its users and ease of use. While perceived usefulness denotes “the degree to which a person believes that using a particular system would enhance his or her job performance”, perceived ease of use refers to “the degree to which a person believes that using a particular system would be free of effort”. Whereas a lack in the perceived ease of use may hinder the adoption of an otherwise useful system, no amount of ease of use can compensate for a lack of usefulness (Davis 1985; Davis 1989). In TAM and additional, extended models, perceived usefulness and perceived ease of use are assumed to influence attitudes towards an object or a technology.

3.5.2. Adoption of technology in social media environments

Baron, Patterson and Harris (2006) advance the critique that little is known about technology acceptance in social environments (Baron et al. 2006). Following the new services logic of Marketing advanced by Vargo and Lush (2008), they argue that the use of technology in social contexts is not a mere question of persuasion; instead, as consumers are co-creating the value of technology use, users embrace a new technology rather than simply accepting it (Vargo & Lusch 2008). In their qualitative study, they were able to demonstrate that in marketplaces with strong community components, social influence has an enhanced role in the adoption of technologies and technology adoption reflects individual needs for relationships with others and social groups (Muniz & Schau 2005). Previous research has primarily investigated technology acceptance with respect to computer programs within organizations or professional environments. However, the adoption of Open Government instruments and tools might be particularly influenced by social components, as their use is often embedded in socially enriched environments.

3.5.3. Rewards from using technologies

An enhanced social influence on the intention to use a new technology is not the only aspect that must be considered when investigating technology acceptance in community settings. Kim and Han (2009) proposed to investigate also the hedonic and social values associated with the use of new technologies (Kim & Han 2009). These two value dimensions might be particularly important for the intent to use within communities. Nysveen et al. (2005) integrated social values in their study and termed it expressiveness (Nysveen et al. 2005). They defined it as the degree to which users of mobile services perceived the service as suitable to express their emotions and social or personal identity. Enjoyment is one element of hedonic value that can be derived from technology use (Kim & Han 2009) and represents the intrinsic motivation to use a technology (Igarria et al. 1996). It has been shown to have predictive power in various contexts. The role of enjoyment was initially studied in the context of computer games (Holbrook et al. 1984). Davis, Bagozzi and Warshaw (1992) applied the concept to explain user acceptance of computers in the workplace (Davis et al. 1992), and Dabholkar and Bagozzi (2002) revealed that enjoyment is a significant determinant of attitudes towards the use of technology-based self-services (Dabholkar & Bagozzi 2002). Following Fuller et al. (2011), humans generally enjoy cognitive tasks and receive pleasure from online activities (Hoffman & Novak 2009) or the co-creation process itself. As participation in Open Government communities is completely voluntary, we assume similar underlying interests. Citizens may seek enjoyable experiences and participate in virtual consultation or dialog processes because they consider them to be an activity that is intrinsically rewarding and easy and useful to conduct (Carpini et al. 2004).

3.5.4. Information systems-related affordance theory

A central concept in Information and Communication Theory (ICT) that may shed light on the concept of active citizen engagement is “affordances” (Gibson 1979; Kane et al. 2011; Markus and Silver 2008), which seem useful for developing improved theories on the effects of introducing new systems into the political discussion. A technology must therefore be related to the social setting, or as Zammuto et al. (2007, p. 753) suggest, “it makes limited sense to talk about a door handle without discussing the people opening the open doors”. Information systems research defines affordances as “the possibilities for goal-oriented action afforded to specified user groups by technical objects” (Markus and Silver 2008, p. 622). ICT refer to devices, software, data, and processes. Moreover, the interaction must be designed such that both individuals and organizations are satisfied with the systematic information processing (Majchrzak & Markus 2012). The contemporary information- and communication-driven approach to Open Government incorporates this development by “elevat[ing] citizens to a much more active level of participatory and deliberative inclusion” (Heckmann 2011, p.2). In the words of Majchrzak and

Markus (2012), “the concept of technology affordance refers to an action potential, that is, to what an individual or organization with a particular purpose can do with a technology or information system” (Majchrzak & Markus 2012). An Open Government community platform that provides new affordances for active citizen engagement in the political discussion is hence the focus of our analysis. By treating the symbiotic relationship between human action and technological capability as the unit of analysis, the affordance perspective provides a language for beginning to examine ICT and its role in affecting online citizen participation. In contrast to the centralized and intermittent dialogue in the offline world, OGCs afford continuous conversations with other citizens, experts, and politicians in an asynchronous or synchronous mode without being geographically collocated (Mossberger et al. 2013).

3.5.5. Résumé on politics and a technology perspective

Because Open Government is largely driven by technology-related influences and is thus characterized by numerous technology-driven research activities, this theoretical perspective must be considered very important. Beginning from discussions of the general availability of information and data, required formats, functionalities and the usability of Open Government platforms, the abovementioned theories of planned behavior, technology acceptance and technology adoption, and finally, the perceived rewarding effects of using technologies provide numerous indications on how researchers should analyze the on-going interactions between technology and citizens. This is of utmost importance when considering the need to attract citizens, mobilize them and ultimately offer them a user-friendly enjoyable platform experience to achieve the overall aim of enabling citizens to approach, develop, and discuss political challenges in a more collaborative manner. Technology affordance theory may provide us with a relevant framework to consider Open Government communities from a technology-focused and integrated perspective.

4. *Research approach and methodology*

4.1. *Applied methodology*

A multi-method approach was applied to obtain a deeper understanding of the stated research questions (Hall 2001; Tashakkori & Teddlie 1998; Tashakkori & Teddlie 2003). The strength of mixed method research lies in its holistic approach to viewing and answering research questions. Thus, mixed method research helps offset the disadvantages of using certain methods in isolation, thereby enabling the researcher to avoid common method bias, and offers the possibility for falsification (i.e., divergent findings) and stronger inferences (Butler et al. 2008).

4.1.1. *Participatory action research and design science*

Participatory action research (PAR) is a special form of case study research that is considered appropriate for exploring rather young fields of research (Gummesson 2000; Perry & Gummesson 2004). "Participatory Action Research Approach" (PAR) refers to a research process in which scientists become active participants and participants become scientists in the project under analysis (Checkland, P. & Holwell, S. 2007). By creating a clear structure for planning, implementation, execution and systematic learning loops, this approach can ensure that a new phenomenon, with all its complexity, is analyzed in a concrete use case (Butler et al. 2008). Therefore, the PAR approach is primarily used for research questions that have received little analysis and require scientists to be actively immersed in the project. Furthermore, the approach is expected to reveal specific, complex effects that cannot be theoretically expected in advance. An action-based and participatory research strategy was selected for this study because it leverages a combined approach. It creates direct insights and reflections in practice (Checkland, Holwell 2007).

In its essence, design science is a four-staged process: the first stage is concerned with the problem identification stage where researchers and practitioners collaborate in diagnosing the problem to be solved and theorize about how to solve it; the second stage involves the collaborative application of theory to guide action aimed at remedying the problem – the design stage (Österle et al. 2010; Peffers et al 2007). The third stage focuses on the evaluation followed by the diffusion stage (4). In information systems research, the design science approach, which is often discussed as being similar to the action research approach (Baskerville 2008; Baskerville and Myers 2004; Butler et al. 2008), is considered as particularly adequate as it provides a tight fit with system development and allows the identification and development of system design principles (Kohler et al. 2011; Lindgren et al. 2004; Baskerville and Myers 2004). Thus, design science seems to be highly appropriate for this research effort which aims to advance our

understanding of the design of online co-creation systems for knowledgeable citizens and to develop design principles of pragmatic relevance (Winter 2008).

4.1.2. Log file analysis

To retrieve the actual number of ideas, comments, and evaluations contributed, we were able to examine the log file of the server – the server database that logs any event happening on the online platform (Von Hippel & Lakhani 2003). Whenever the user logs in, the system inherently creates data, leaving a trace of the user's actions on the platform. As the server tracks every visit and behavior on the platform, valuable information can be extracted concerning the number of ideas contributed, the number of return visits, and other site use and navigation behaviors (Von Hippel & Lakhani 2003).

4.1.3. Online survey

Online surveys were conducted after the crowdsourcing initiatives to test the developed hypotheses and obtain additional demographic information. For all measurements, existing scales taken from the literature have been applied but slightly modified to the context. The online survey was conducted in German. English scales or items were translated by a bilingual expert and subsequently re-translated to control for language and translation-specific differences. After an online pre-test, data were collected using the final questionnaire was over a period of typically two to three weeks. To assess the possible non-response bias, the means of early respondents and late respondents were compared, and no significant differences were found.

4.1.4. Qualitative interviews

To triangulate the quantitative data, resulting from the log file data and the online survey, the author conducted selected, semi-structured interviews with heavy-users of the two platforms (Morse 1991; Jick 1979). Those interviews lasted 30 minutes on average and included a brief introduction to the overall topic and then addressed the various research topics such as motives, experience on the platform, and consequences. Various multivariate statistical procedures such as structural equation modeling (Bagozzi & Yi 1988; Fornell & Larcker 1981) have been applied for hypothesis testing and the exploration of causal relationships between the independent and dependent variables or constructs that were previously formulated in a theoretical model.

4.1.5. Social network analysis

Researchers have studied networks by analyzing social patterns (Kozinets 1999; Kim 2000) or users' contribution frequency (Koch & Schneider 2002), often in combination with their behavior (Nonnecke & Preece 2000; Ye & Kishida 2003; Viégas & Smith 2004). Social Network Analysis,

however, offers a substantial advantage because complex social phenomena such as groups of interacting individuals, community structures, or the importance of users and their contributions (Borgatti et al. 2009) are no longer limited to investigation using qualitative tools but can be explored quantitatively (Nolker & Zhou 2005). In addition, Social Network Analysis enables the researcher to obtain deeper insights into user roles, especially in online networks, identifying key members and revealing user types that would have been overlooked by traditional approaches to network analysis (Nolker & Zhou 2005). The Social Network Analysis approach is based on representing a community as a social network connected by direct member-member relationships (Nolker & Zhou 2005). In our analyzed cases, the physical persons using the platform form the nodes. A relationship or tie between two users is established if a user is commenting on or evaluating another user's idea. The direction of the relationship between two community members indicates the sender and the receiver of a specific comment or evaluation (Hanneman & Riddle 2005).

4.2. Single case studies

4.2.1. Online dialog "Aufbruch Bayern"

The case of "Aufbruch Bayern" (www.archiv.aufbruch.bayern.de), an online dialog platform of the Bavarian State Government, was selected for at least three reasons: First, the "Aufbruch Bayern" case can be considered one of the European platforms with respect to best practices concerning public online participation; second, the platform was similar to other existing Open Innovation idea contests, thereby facilitating comparisons; and finally, the author of this thesis was able to fundamentally influence the conception, realization, "live" and evaluation phases. In July and August 2010, the Bavarian State Government announced an online participation platform. With the publication of the "call for participation", Bavarian citizens were asked to suggest their ideas, concepts and best practice cases related to three main policy areas: family, education and innovation. The duration of the initiative was eight weeks. The overall aim was to actively integrate Bavarian citizens into the policy development process, increase the awareness of these policy areas, and establish a closer relationship between the governmental institution and citizens.

The crowdsourcing was realized using an online community platform, and thus the author had access to a large set of data collected via the publicly accessible platform. Data such as log files (visits, amount and form of activity per user), user data (usernames, user IDs, sent and received messages on profiles) and information on designs (graphics, number of received comments, number and average of received evaluations) were exported from the platform system database (MySQL). These contest data include structured, semi-structured and unstructured data. They represent the major source for our single case study research. Data such as comments,

contributions and ideas were thoroughly analyzed and considered by the research team. This was complemented by a post-project online survey and, most importantly, the observations and experiences of the individual researchers when directly interacting with the participants.

The online dialog “Aufbruch Bayern” can be described as an online platform, on which citizens can articulate, evaluate and discuss ideas, suggestions and concepts. An online dialog typically pursues the following objectives: (1) the generation of a heterogeneous and qualitative idea pool, (2) the development of exciting input for discussion, (3) a sophisticated evaluation of the content and (4) a general realization of a transparent dialog. The Bavarian State Government announced the online participation platform in July 2010. The overall aim was to actively integrate Bavarian citizens into the policy development process, increase awareness of these policy areas, and establish a closer relationship between the governmental institution and citizens. In total, the platform had approximately 2,100 active participants and more than 100,000 visitors. Over the course of two months, 740 ideas were created, approximately 10,000 evaluations were counted and over 6,000 messages were written. Over a period of eight weeks, participants spent 760 working days on the platform, which totals more than 364,800 minutes of time spent on the platform. However, we must note that the quoted 760 working days only relate to the hours spent on the platform. From phone calls, emails and postings, we know that participants spent a substantial amount of additional time at home developing and discussing their ideas within their families or circles of friends. This high time commitment indicates that citizens were highly interested in being actively involved in governmental problem solving activities. The observation that more than 400,000 viewers participated in the interactive dialogue-platform over the course of two months emphasizes the tremendous impact of the crowdsourcing initiative in terms of awareness creation. An analysis of the feedback data collected in the post-project survey supports this argument.



Figure 3 Online Dialog - Aufbruch Bayern
 (source: Screenshot, www.archiv.aufbruch.bayern.de, accessed: January 2014)

4.2.2. Online consultation “Eine Welt Strategie”

As the second Open Government case considered in this thesis, the online consultation ‘One World Strategy’, initiated by the State Government of North Rhine Westphalia, was selected. In July and September 2011, the responsible ministry announced the online participation platform “One World Strategy”. Over the course of 12 weeks, knowledgeable citizens, primarily from North Rhine Westphalia, were invited to upload suggestions on how the ‘One World Strategy’ could be further developed (www.einewelt.nrw.de/start.php). In total, this more expert-focused online consultation had approximately 270 registered members and more than 60,000 visitors. Over three months, 250 contributions were created, approximately 500 evaluations were counted and over 1,050 messages were written. The research team participated in all relevant meetings, calls, and workshops of the project team. Further, researchers were also active on the platform and directly interacted with the users of the system. Thus, they could directly reflect on actions taken and were able to evaluate the design principles and their impact on user participation in the virtual co-creation system.

On the home page of the platform, the Minister for Domestic Affairs, Europe and Media in North Rhine Westphalia welcomed all visitors textually and highlighted the potential of the participation platform. A login/registration box was placed above a video, where registered users were able to sign in and new users could access the registration page and register by providing a user name and e-mail address. Furthermore, the page displayed the ten different areas of activity for which the participants could submit entries: energy, environment, fair trade, education, universities and

science, media, culture, health and the economy, peace, migration, and cooperation. A color-coding system for the subpages of the online-consultation platform provided a concrete reduction in complexity for the user.



Figure 4 Online Consultation – One World Strategy (Home)
 (source: Screenshot, <http://www.einewelt.nrw.de/start.php>, accessed: January 2014)

Through the main menu tab “join the discussion”, participants were directed to the summary pages of the various subject fields. In addition to a key visual for each topic, a brief summary of the topic and the key questions and additional PDF attachments containing detailed information were provided. Guiding the participant by providing key questions to focus their submissions prevented rambling discussions on issues that ultimately could not have been considered. Contributions to the subjects could then simply be uploaded through an idea submission form, which was presented under the brief description of the topic. Other users on the platform were able to evaluate the submitted concepts and ideas by simply “liking” them using a “thumbs-up button”.

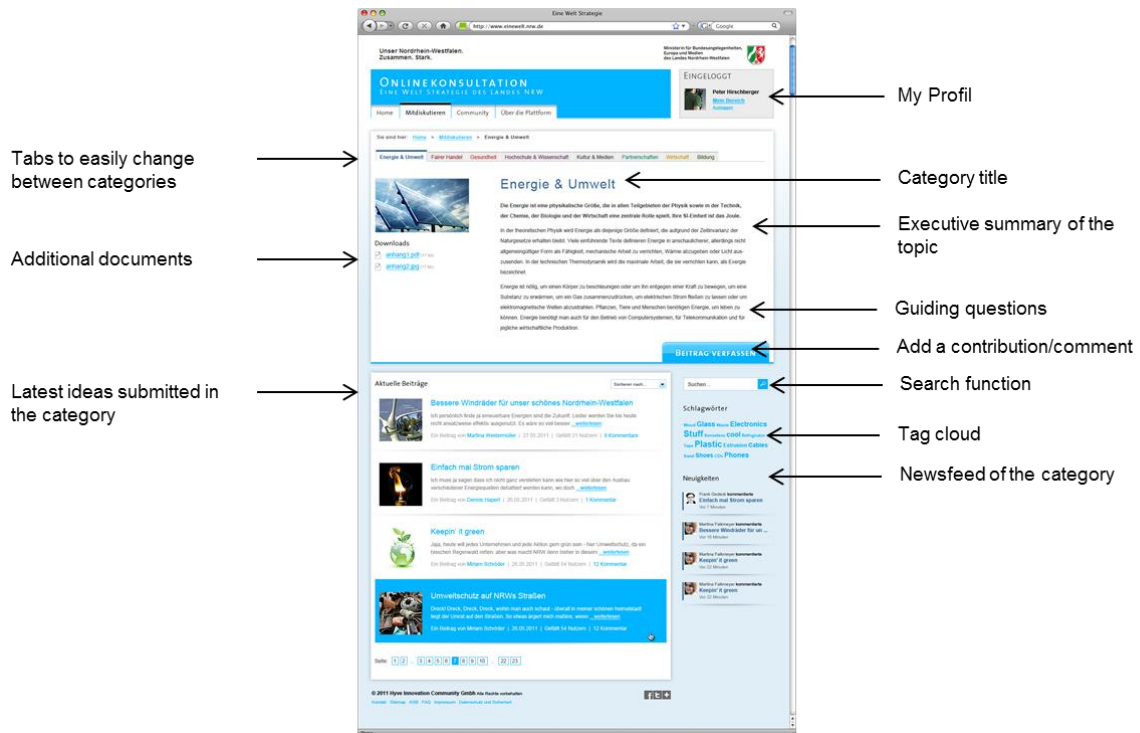


Figure 5 Online Consultation – One World Strategy (Sub Page)

(source: Screenshot, <http://www.einewelt.nrw.de/joinDiscussionont.php> , accessed: January 2014)

The contributions related to the topic field could be read, evaluated and commented on by other community members. Furthermore, we allowed participants to write messages to other community profiles, which were also displayed in different activity streams (global, topic-related, personal). Moreover, a static information page was provided, which allowed citizens to collect further information on the topic in general as and the "rules" of the platform. The community, which consisted of the registered participants, was displayed on a special subpage to provide the possibility to search for other members, see their profiles, leave messages on their “walls” and sustainably promote social and interactive exchange.

5. *Research agenda, major findings, and implications*

The following research agenda builds upon the theoretical foundation introduced above by developing, testing and analyzing separate research questions. Because each research question is comprehensively explored in its respective article, the following chapter provides only the basic assumptions to allow the interested reader to follow the common thread of this thesis.

5.1. *Motivation perspective (research article I)*

Background & Relevance: The first article addresses the topic of citizen motivation. Why motivates citizens to engage in Open Government activities, and what are the main drivers of these motives? Governmental crowdsourcing activities, as a new means of including citizens in public problem-solving and value-creation activities, require citizens who are motivated and committed to actively contributing and participating. Valuable contributions that lead to significantly improved results can only be expected when citizens are willing to engage in governmental crowdsourcing projects and are empowered to share their creative ideas, honestly state their preferences, and comment on existing concepts.

Research Questions: Thus far, the discussion on crowdsourcing has devoted little attention to the public sector. Consequently, our aim is to address two research questions. First, what motivates citizens to engage and submit their ideas, comments, and evaluations in response to an open call for contributions in governmental crowdsourcing initiatives? Second, how do the identified motives affect community members' actual participation behavior during the early stages of the new policy development process?

Theoretical Foundation: This article refers to theories of political participation behavior in general and, in particular, to arguments on political offline participation and citizen participation behavior concerning static but online-based eGovernment services. Moreover, we rely on a comprehensive set of research and theory, which explored why users and consumers participate in corporate online crowdsourcing activities.

Empirical Setting & Results: A survey of 437 citizens who participated in the online crowdsourcing initiative *Aufbruch Bayern*, initiated by the Bavarian prime minister's office, and analyzing their motive structures and contribution behavior reveals that citizens' motives to engage in governmental crowdsourcing initiatives significantly differ between active and less active citizens.

Contributions: In addition to theoretical contribution, we discuss the managerial implications of the actions public institutions can take to create a vibrant governmental crowdsourcing initiative. The main insights reveal that citizens seem to engage in online governmental crowdsourcing

initiatives for three main reasons: (1) a general interest in public sector and its topics, (2) an interest in the platform community and (3) disenchantment with current politics and users' desires to improve the overall political situation. While the three motive dimensions are forms of intrinsic motivation, our study also demonstrates that extrinsic motivation, in form of monetary compensation, seems to be insignificant. Our research suggests insights into how the different motives influence citizens' contribution behaviors, thereby contributing to the literature in terms of the individual motivational aspects, the contribution context and behavioral patterns. Several implications may be derived from these findings. In addition to theoretical contributions, we discuss the multiple managerial implications of the actions public institutions can take to support participants' natural motives and increase potential platform quality and quantity.

5.2. Experience perspective (research article II)

Background & Relevance: The aim of the second article is to better understand the potential of governmental crowdsourcing initiatives. This article does not focus on citizens' motive structures but instead explores their participation experiences and their influence on citizens' ability to increase their general understanding of political decision making. This framing allows manifold insights into designing the most appropriate crowdsourcing experience for citizens, thereby making it possible to actively shape the government-citizen relationship.

Research Questions: Little is known about citizens' active engagement in virtual governmental crowdsourcing activities or how the participation experience affects citizens' skills to better understand and possibly contribute to the political system. Because the existing research has particularly concentrated on the phenomenon of citizen participation in real life, this article explores the relevant components of a valuable governmental crowdsourcing experience and how this experience influences citizens' affective relationships with governmental institutions.

Theoretical Foundation: Theories of democracy suggest that public value can be better developed when citizens have the opportunity to be directly and actively involved in policy making. Further, active political engagement is considered to contribute to a better identification and articulation of citizen's needs, which may result in more citizen-oriented decision making. Beginning from those two theoretical foundations, the article introduces a technology acceptance model to explore the relevant dimensions of a valuable platform experience for citizens. To determine the independent variables of the research model employed, the article relies on integrative and deliberative theories of democracy, which focus on an institution's ability to shape democratic citizens. Because democratic citizens are considered to be well equipped with social, political, intellectual skills, the article considers the related literature.

Empirical Setting & Results: We use real-life data and an online survey and analyze log files from the governmental crowdsourcing initiative “Aufbruch Bayern”. Our results reveal that “platform experience” can be interpreted as a second-order factor, which is determined by the factors that provide feelings of “task enjoyment” and “utility”. Moreover, the results demonstrate that a valuable platform experience has a significant and positive impact on “social” and “political” skills and perceived “political empowerment”.

Contributions: The research indicates that a “valuable platform experience” should be understood as a second-order factor, consisting of “task enjoyment” and overall perceived “utility”. Governmental crowdsourcing initiatives seem to serve as a fruitful enabling and learning environment that allows individuals to become democratic citizens, including social, political, and intellectual skills. Further, the findings reveal that online participation activities contribute to perceived citizen empowerment. Furthermore, we found that a valuable platform experience has a significant impact on real behavior, measured by the number of contributions.

5.3. Community perspective (research article III)

Background & Relevance: Crowdsourcing activities are, by definition, primarily based on community mechanisms. Consequently, those initiatives rely on personal knowledge, creativity, experience and openness and on community-related measurements such as connectedness, communication, and transparency. Thus, the ability to better understand the functioning of a community in general and, for instance, explore different types of platform members and their roles and contributions has become critical for community managers to better integrate and direct the crowd and ultimately use the generated content effectively.

Research Questions: User roles have been shown to differ according to the community’s purpose, which increases the relevance of this research because it is the first to focus on a governmental crowdsourcing community. The aim of the study is to examine of participants’ roles in governmental crowdsourcing platforms and their impact on community growth, including output quantity and quality. Thus, we address the following research questions: What are the key user roles in an Open Government community? How do those roles influence the community’s growth over time?

Theoretical Foundation: The article uses network theory to understand the fundamental operation of communities. Furthermore, we rely on the existing literature, which discusses community formation in general and provides insights into different member roles and the importance of content.

Empirical Setting & Results: In this exploratory study, we investigate participant heterogeneity in governmental crowdsourcing initiatives. We selected the ‘Aufbruch Bayern’ participation

platform to analyze our research questions. In July and August 2010, the Bavarian State Government announced the formation of an online participation platform. We quantitatively explore the communication and contribution behaviors of individuals using social network analysis (SNA) and cluster analysis to identify different user types. Analogous to Open Innovation research, we expect to observe types and roles such as socializers, idea generators, passive commentators and passive idea generators associated with various behavioral contribution patterns. A qualitative content analysis of contributed comments and a quantitative survey further allow us to understand the types of contributions and meaning of communicative relationships.

Contributions: One central contribution in this research is the classification of the network population into six user roles, namely, motivators, attention attractors, idea generators, communicators, masters, and passive users. Further, the identified user roles differ significantly in their communication and commenting activities and their contributions to the platform's main purpose, as measured by submitted ideas. Another central finding is that governmental crowdsourcing initiatives must be interpreted as an "eco-system" of user roles, which evolves over time and the success of which depends on achieving the proper mix of the different roles.

5.4. Platform/technology perspective (research article IV)

Background & Relevance: Contemporary policy makers increasingly employ information and networking technologies to interact with citizens throughout policy-making activities. In this article, we study a novel form of citizen participation, defined as online citizen co-creation, in which citizens collaborate to actively develop an integrated and novel policy solution. This phenomenon of online citizen co-creation offers new opportunities for formulating effective policy solutions but requires the successful participation of citizens. The information systems literature provides few insights and little guidance on how to design online citizen co-creation environments such that citizens actively participate in policy development.

Research Questions: In this article, we empirically conceptualize the socio-technical design of the online co-creation systems through which citizens co-create novel policy solutions, with a particular focus on policy formulation involving knowledgeable citizens who possess domain-specific knowledge in a particular policy area.

Theoretical Foundation: To develop our design framework, we introduce the public policy development process and discuss the specific nature of public policy problems to be solved in the policy formulation stage. Moreover, we theorize on the design of citizen innovation co-creation from an exchange perspective and introduce our citizen co-creation design framework for policy formulation. This framework serves as the basis for our action research on the design principles for citizen innovation co-creation in the policy formulation.

Empirical Setting & Results: We conducted a 22-month participatory action research project in which we created, implemented and evaluated an online citizen co-creation system for policy formulation in two action research cycles. In 2011, the research team and the State Government of North Rhine Westphalia, Germany decided to conduct a participatory action research initiative on online citizen co-creation in the political area of a ‘One World Policy’.

Contributions: The study presents a novel design framework, grounded in exchange theory, for designing the participation methods of online citizen co-creation and derives 11 design principles. The results enrich the existing literature on participation architecture and system design by delineating critical design dimensions in online citizen co-creation and presenting actionable design guidelines for policy makers and system designers.

6. Discussion

This chapter ties the empirical findings of the four studies to the various streams of theory and bodies of knowledge introduced above. Based on this discussion, certain fundamental principles, which may serve as an initial framework for a theory of Open Government platforms and especially their citizen communities, are introduced. To do so, this chapter draws on an approach known as “interrelations strategy”, which allows the researcher to begin developing a theory by combining and integrating different, previously unconnected streams of knowledge from relevant strands of the literature (Yadav 2010). The principles concern general propositions regarding the mechanisms of Open Government community platforms, how they should be conceptualized, how they operate, and how they can be established and managed. In addition to improving understandings of these issues, these principles can help organize thoughts, generate coherent explanations and improve predictions regarding the young phenomenon of an OGC (Hambrick 2007). Furthermore, the ten principles introduce and discuss the most relevant implications for practitioners.

6.1. Fundamental principles of OGCs relevant for researchers & practitioners

This research reveals important implications for both researchers and practitioners. In our setting, the latter may include system designers and managers working for the public administration, politicians, and consulting agencies seeking to virtually integrate citizens, experts and politicians into more participative online processes. To ensure structured argumentation, six prevalent topics were identified, each of which gathers different principles: 1) recruiting, activating, and motivating citizens; 2) the heterogeneity of OGC; 3) the relevance of OGC experience; 4) the OGC design selected; 5) the external connectedness of OGCs; and 6) the value created by OGCs (Figure 16).

Recruiting, Activation, and Motivation of Citizens	
Principle I:	Open Government providers have to consider citizens' different motives structures when setting up the recruiting and activation strategy.
Principle II:	The incentives provided on an OGC need to be compatible with citizens' motives and should trigger the expected goals with respect to citizens' desired action on the platform.
Heterogeneity of OGCs	
Principle III:	Participants of OGC are generally heterogeneous and differ in their expectations, behavior, motives, skills, and contributions.
Principle IV:	Participants of OGC tend to group into different community roles, which all seem highly relevant in their specific characteristics for an overall project success.
OGC Experience	
Principle V:	OGCs have to provide both a useful as well as enjoyable platform experience.
OGC Design	
Principle VI:	OGC design principles should consider a holistic view including technology, process, topic, as well as communication perspectives.
External Connectedness of OGCs	
Principle VII:	Besides the citizen community, OGC need to integrate officials as well as experts to ensure a proper and sustainable implementation of the developed solutions.
Value creation of OGCs	
Principle VIII:	OGC have to provide value to both, citizens as well as other participating institutions (stakeholders).
Principle IX:	OGCs create value through collaborative modes, the exchange of resources and shared experiences.
Principle X:	The active OGC experience of citizens seems to influence some of their skills as well as their attitude towards the political system in a positive way.

Figure 6 Open Government – Dominating Topics & Principles (source: own description)

6.1.1. Principles related to recruiting, activating, and motivating of citizens

Principle I: Open Government providers must consider citizens' various motive structures when determining the recruitment and activation strategy. The article forming this project gather manifold insights regarding the diverse motive structures of citizens and their influence on recruitment and activation activities. We have demonstrated that OGC are typically characterized by a heterogeneous community structure, which also results in a diverse motive structure. Intrinsic and internalized extrinsic motives seem to be the most crucial. Extrinsic motivations, which may include monetary incentives, tend to be irrelevant. When discussing motives to participate, we found that the task considered and the related task descriptions play an important role. Further, grounded in affordance theory and the technology acceptance model, we developed various design features for citizen-orientated co-creation platforms that respond to the motive structures of citizens. Finally, the underlying communicative logic of OGCs (e.g., the role of opinion

leaders, peer-to-peer communication, bi-directional and collaborative communication mode) resonate with recent social media literature and thereby contribute a valuable perspective to existing theories of political communication behavior, which have primarily focused on the mass media.

Principle II: The incentives provided on an OGC need to be compatible with citizens' motives and should accomplish the expected goals with respect to citizens' desired actions on the platform.

Our research reveals that citizens participate in OGCs for different motivational reasons. Except for an adapted recruiting strategy, which may result in a different group of citizen participants, the motives of participating citizens are fixed, at least from a platform provider's perspective. However, platform providers can control the incentive structures of OGCs. Consequently, the incentive structure, which should be aligned with citizens' motive structures, is an important mechanism by which the platform provider can encourage the desired community actions on the platform and, thus, the expected platform output. Our research has demonstrated that many characteristics may have an incentivizing effect on citizens' participation behavior in a community setting, including the task itself, community interaction, peer feedback, expert evaluations, or the co-creation process itself, to mention only a few.

6.1.2. Principles related to the heterogeneity of OGCs

Principle III: Participants in OGCs are generally heterogeneous and differ in their expectations, behaviors, motives, skills, and contributions. Research indicates that community members differ greatly in their motives, personalities and skills (David and Shapiro 2008; Fuller 2007; Oreg and Nov 2008) and that this plurality is what makes crowdsourcing or co-creation communities in public sector settings successful (Page 2007). Considering this principle of member plurality entails that OGC providers need to recognize the diversity of their participating citizens and offer various modes of interaction, activities with different levels of complexity, and an array of incentives to attract a wide range of participants. From a theoretical point of view, this principle may be addressed from different perspectives. First, theories of public administration, democracy, participation and citizen engagement may help to structure the content and relevant tasks. Second, the complexity of a joint policy development may be addressed by considering co-creation and crowdsourcing approaches, where the reduction of complexity and the relevance of modularity is discussed. Third, information system design theories may be applied to align the task- and content-related challenges experienced in the OGC, including not only software-based platform features but also aspects such as community management. Finally, the abovementioned (principles I & II) theories of user and citizen motivation may help successfully address the third principle. Our findings have demonstrated that OP communities comprise users with various backgrounds, including different age groups, (non)-immigrants, different levels of knowledge and

expertise and gender. Common interest politics, mutual activity, or dissatisfaction with the current political situation is what brings these individuals together and allows a community to be developed.

Principle IV: Participants in OGCs tend to group into different community roles, all of which seem to have characteristics that are highly relevant to the overall success of a project. Another interesting insight gained through our research concerns the different community roles in an OGC. Our results indicate that OGC communities consist of different sub-communities, which differ in their platform activities. In other words, an entirely inactive platform visitor has a similarly important role as a highly active “master”. It seems that all roles are ultimately necessary to develop satisfactory OGC output. This result also refers to the abovementioned principles because the different sub-communities require different incentive structures, platform features, and platform design elements.

6.1.3. Principles related to the OGC experience

Principle V: OGCs must provide a useful and enjoyable platform experience. Both useful and enjoyable OGC experiences seem necessary to attract a critical mass of qualified citizens, convince them to spend their time on the platform, share their knowledge and experience, and create valuable outcomes. As described in the principles above, the co-creation experience is generated by the participants themselves; however, it is also determined by the (technical) environment provided and the tasks offered. The design of the environment and tools offered depends on the participating citizens and the goals of the platform provider (cf. principle II). A wide variety of tools and platform features exist that empower citizens and allow for the effective and efficient accomplishment of the assigned tasks (cf. research article IV). In line with other research on co-creation and based on Affordance Theory and the Technology Acceptance Model (TAM), we find that useful and enjoyable experiences will result in a valuable overall OGC experience. Further, this positive platform experience has a positive impact on the intended outcomes and the behaviors displayed by registered and active citizens.

6.1.4. Principles related to OGC design

Principle VI: OGC design principles should be developed from a holistic perspective that includes technology, process, topic, and communication perspectives. The fourth article of this dissertation focused on the development of theoretically grounded design principles, which provide relevant indications on how a co-creation system should be conceptualized, developed, and managed to encourage active citizen participation. From our perspective, system designers or the platform provider need to recognize that simply inviting citizens to participate on a perfectly functioning virtual collaboration platform is insufficient when designing an OGC. It is important to design the

overall exchange relationship from a socio-technical perspective. When citizens participate in an OGC, they have certain expectations regarding the interaction processes involved, which should address technology, tasks, interaction processes, and the network component. To conclude, a purely technically driven platform design strategy will most likely reduce the probability of realizing a successful citizen co-creation process. Instead, we suggest investing sufficient time in the design of the interaction processes (cf. the subsequent principle), network components and, specifically, the content and tasks.

6.1.5. Principles related to the external connectedness of OGCs

Principle VII: In addition to the citizen community, OGCs need to include officials and experts to ensure the proper and sustainable implementation of the developed solutions. From an institutional (e.g., administration, ministry, political party) perspective, the application and successful utilization of OGCs depends on managers' (in our case, officials') cognitive evaluations and subjective norms concerning more collaborative approaches to citizen integration. The attitudes of (potential) OGC providers towards the potential benefits, on the one hand, and the risks or drawbacks of OGCs on the other, combined with OGC management-related activities, determine the future success of Open Government projects. Moreover, the ability to successfully implement the solutions obtained from the OGC and the expected approval by relevant reference groups such as peers or management (ministry), further drive the decision to initiate OGC, but this also depends on devoting the necessary attention and commitment during the implementation of the OGC. The latter should ensure that the OGC receives all relevant resources in terms of committed officials who are willing to share their topic-related knowledge with citizens on the platform or who support citizen-generated solutions while being adapted to fit internal standard processes and be implemented. In this context, other knowledge carriers such as professors, employees of foundations or other non-profit organizations or private sector companies may also serve as valuable supporters.

6.1.6. Principles related to the value creation of OGCs

Principle VIII: OGCs must provide value to both citizens and other participating institutions (stakeholders). The theories outlined above indicate and our empirical findings confirm that participants in OGC tend to regard their online participation as valuable and rewarding. Otherwise, they would be neither interested in nor willing to devote their resources such as time, effort, knowledge and know-how to the Open Government offering. As a consequence, successful OGCs must provide value for their relevant population of citizens (e.g., only knowledgeable citizens vs. "all" citizens). Furthermore, OGCs also need to add value to the initiating institutions, which in our cases were the state chancelleries of Bavaria and North-Rhine Westphalia and their

officials from various departments. This included the minister and her staff and the special departments with topic-related responsibilities (e.g., the department for one world policies) or cross-departmental functions such as (online) marketing, legal or quality assurance. A successful OGC provides additional value, such as new and more diverse ideas and best practices, for all associated stakeholders.

Principle IX: OGCs create value through collaborative modes, the exchange of resources and shared experiences. As we have shown, citizens and institutions generally participate in OGC because they are able to create outputs that they could not generate by themselves (Prahalad and Ramaswamy 2004b). The exchange of resources and collaborative work on (complex) challenges enables the community to discover better solutions and more creative outputs than an institution or individual alone (Sawhney and Prandelli 2000). Because OGCs focus on solving fairly theoretical or service-oriented challenges, citizens' knowledge, skills, and experience can be considered the most important resources (Vargo and Lusch 2004). In addition, a perception of community spirit creates a community experience, which seems to provide the type of "stickiness" its community members require (Kozinets 2002a). We identified and analyzed different forms of resource exchanges, ranging from negotiated exchanges between individual citizens to complex and generalized forms of productive exchange from which a "publicly owned" solution ultimately emerged. In general, and irrespective of the type of incentives offered, it is important that the incentives and their distribution are considered fair and aligned with the communicated objectives of the OGC (Gebauer et al. 2012).

Principle X: The active OGC experience of citizens seems to have a positive effect on some of their skills and attitudes towards the political system. Various theories of democracy state that the most important component of their theories is democratic citizens. As described in this synopsis and article II, OGC may provide valuable support for the development of democratic citizens. The latter are considered to be well equipped with social, political, and intellectual skills, as well as related experiences. By offering a new channel for political debate and discussion, sharing and seeking information, and active political engagement, citizens are able to test, further develop or share their knowledge, skills and experiences. Because the abovementioned skills may only develop if they are applied, tested and actively used, OGCs may be understood as laboratories in which citizens may (anonymously) learn or further develop skills relevant to being a democratic citizen. In an era when social media in general and virtual discussion in particular are becoming increasingly important, OGCs seem to provide an additional, state-of-the-art channel for developing democratic citizens.

6.2. Conclusion, limitations and further research

6.2.1. Conclusion

The research presented in this thesis contributes to a better understanding of OGCs, while primarily relying on existing knowledge on Open and User Innovation and its potential in a public sector environment. Furthermore, and for the first time, the research describes OGCs from various, previously rather unconnected, streams of literature. Relying on selected theories, this research provides various insights into how OGCs and their related communities operate and how they should be designed and subsequently managed. Further, this research describes the types of citizens that engage in such communities and for what reasons, motivations, and with what expectations. In addition to the theoretical underpinnings, this work also offers empirical findings on public-sector related and thus citizen-oriented participation platforms from five different perspectives: 1) a democracy perspective; 2) a public administration perspective; 3) a communication perspective; 4) a community perspective; and 5) a technology perspective.

The *democracy perspective* helps us better understand the potential of OGCs in general and serves as a basis for both the practical and theoretical relevance of this topic. As representative democracies increasingly face problems of legitimacy because individuals do not always feel well represented, integrative theories of democracy, which assume that individuals are able to suppress their own interests during the democratic decision-making process, seem to provide especially relevant arguments for OGCs. Referring to the various dimensions of virtual, collaborative, and constructive modes of citizen participation, this theoretical perspective provides several initial considerations regarding why, how, for whom and where OGCs should be implemented.

The *public administration perspective* enabled us to discuss administrations' prospective roles when considering which digital citizens or expert communities will play an important role in providing public service support. Consequently, the role, function, and especially, the service delivery of public administrations will be substantially redefined. Public administration may act akin to a "conductor" by identifying the relevant topics, activating citizens to contribute, providing topic- and process-related know how and, finally, managing and directing the implementation. Meijer (2011) thus concludes that "virtual citizen communities have come to play an increasing role in contacts between administration and citizen. The networked character of the new media forms an impetus to change government-citizen relation, and will foster both the exchange of information and social-emotional support" (Meijer 2011, p.606). In addition to those rather general thoughts, this perspective enabled us to consider concrete tasks (e.g., community management, recruiting, providing feedback), roles (e.g., content related expert, jury member, community manager), and public administrations' understanding of being the initiator, host, and hopefully, beneficiaries of OGCs.

The *communication perspective* appeared highly relevant for OGCs because those projects are typically characterized by high media attention. Similar to co-marketing or user-engagement marketing in industry settings, OGCs not only focus on the generation of ideas or concepts but also provide numerous communication-related benefits and potentials, as well as challenges. The emerging logics of social media, which also influence the functioning of OGCs, have changed the traditional definition of (political) communication. In contrast to traditional communication, citizens become co-creators of the meanings of their experiences via social applications - decisions are not marketed to citizens, but with them (Vargo & Lusch 2004). The underlying logic draws on network-based structures of primarily virtual communities in which like-minded citizens connect to share content and opinions. From a citizen perspective, we know that citizens increasingly rely on discussions and feedback from other citizens on social media. This development, however, also creates numerous challenges for the public administration. Not only do they need to identify new formats to activate and channel the voices of citizens, but they must also ensure that citizens do not expose the decision, service, or brand to negative word-of-mouth or manipulation.

The *community perspective* enabled us to understand the basic operations of communities, especially in a public sector setting. This perspective includes the identification of the appropriate citizen communities, the processes of communication, recruiting, activating, and mobilization, the identification, monitoring and active assembly of the necessary roles within the community, the provision of appropriate incentives, and finally, fair treatment (community management) during the citizen participation process.

The *technology perspective* acknowledges that the topic of OGC is largely driven by technology-related trends. Various aspects, such as the ongoing discussions on the general availability of information and the data, required formats, functionalities and usability of OGCs and theories such as technology acceptance and technology adoption provide indications of how researchers should analyze on-going interactions among technology, the administration and citizens. To conclude, a purely technically driven platform design strategy will most likely reduce the probability of a successful citizen participation process. System designers need to design the exchange relationship in light of the participation objectives of citizens while considering all of the perspectives introduced above.

In summary, this synopsis provided certain fundamental principles for developing a theoretical framework for OGCs and their related (citizen) communities. The various theories and theoretical perspectives introduced in this synopsis, combined with the findings gathered from the empirical work, lead to 10 fundamental principles organized along six dominant topics: 1) the recruiting, activation, and motivation of citizens; 2) the heterogeneity of OGCs; 3) the relevance of the OGC

experience; 4) the OGC design selected; 5) the external connectedness of OGCs; and 6) the value creation of OGCs.

The framework developed in this research can be considered an initial attempt to provide an integrated theory for OGC. While we do not claim that the fundamental principles are complete, they may help explain how public sector OGCs and their communities operate and how they should be planned, designed, and managed and how the output generated is ultimately transferred to real policies. These findings should be relevant to managers, who facilitate the implementation of successful community platforms by addressing the participants' various sets of motives and expectations.

6.2.2. *Limitations and further research*

While this research sheds light on numerous aspects of OGC, it cannot address all of them. This research faces several limitations and raises a number of yet unanswered questions that demand further research. The following paragraphs present some general limitations and related research opportunities that seem relevant to the overall thesis. Furthermore, at the end of this chapter, we discuss some more detailed research questions, which primarily relate to the four articles in this thesis.

Although the two case studies provided a unique setting to study the various research questions in a comprehensive and profound manner, our theoretical and, especially, practical contributions may lack external *validity and generalizability*. All of the insights were deduced from the two citizen participation projects in Germany and may thus contain various topic- or culture-related biases, for example. As a consequence, the results may hold for numerous cases (e.g., European or even all Western democracies) but not in others. Therefore, future research could focus on reproducing our findings by considering other OGCs, which may differ with respect to the topic selected, community size, cultural background or nationality. Researchers might consider validating our results and insights in other cultural settings and different types of democratic systems.

In addition, further research at an *individual level* (e.g., citizen, expert, or jury member), *community level*, or *institutional level* (e.g., politicians, public administration, governmental organizations, political parties) is needed to deepen our understanding of the functioning of OGCs. Being able to invest additional time and resources in the detailed questions that we identified, which were, for example, raised in the four articles, or examining other Open Government communities in greater detail would give rise to an unlimited number of additional research questions.

For instance, a deeper analysis of the most appropriate citizen *community structure* may provide relevant insights into how the various community types and roles could be linked to the identified motive structures and how an optimal community growth strategy may be developed.

Further, our research indicated that the ways in which politicians and *public administrations* select topics for OGCs could be improved. However, the appropriateness of discussing certain problem settings, topics, and tasks in a more open and collaboration oriented way seems to differ. Thus, further research should focus on decision heuristics, which support politicians' and administrations' efforts to identify relevant topics and determine the most appropriate topics and tasks (task specification).

Another potential stream of further research could focus on *process-related questions* to better connect virtual OGCs to offline activities and existing internal policy development processes. This research revealed that a great deal of potential efficiency and effectiveness gains is lost in various process-related interfaces.

Future research questions focusing on *technological developments* are highly relevant but less definite, as rapidly changing technologies will remain a very important driver of OGC use. New community networks, the trends of peer-to-peer and content marketing, and increasing mobilization may serve as initial relevant indications regarding what new technological developments need to be considered in future OGC research.

In summary, future research could consider, among others, the following research questions, which arose during the three years of research involved in this thesis. How do motives and related incentive structures differ with respect to the policy cycle? How can a sustainable OGC process be designed? How can the interaction between the OGC and the public administrations be structured, given the volume of information, data, and resources involved? How elaborate could a topic-related modularization be to motivate a potentially diverse and heterogeneous citizen community? What types of incentives lead to which types of citizen contribution, and how will those motives and related incentives change over time?

Considering these shortcomings, this research has attempted to gather initial experiences towards the development of a theory of OGC. Therefore, this work will motivate us and the research community to further explore this exciting research topic in theory and practice.

7. Literature

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8. Annex

Annex A - Summary of Results in English and German

Annex B - List of Research Articles and Status of Publication

Annex C - Research Article I

Annex D - Research Article II

Annex E - Research Article III

Annex F - Research Article IV

Annex G - Selbstdeklaration bei kumulativen Promotionen

Annex H - Eidesstattliche Erklärung

Annex A

Summary of Results in English and German

Summary of Results

Today, complex social challenges often question the very fabric of modern society with alienated citizens and create deep-seated tensions between them and their government. This PhD thesis shows how information and communication technologies in general and Open Government communities in particular may contribute to enable unprecedented opportunities for systematically fostering civic engagement in virtual and more collaborative system environments. In opposite to the private sector, where community-based approaches have already become popular strategies for systematically implementing distributed and participatory problem solving, the public sector hesitantly started with more open, citizen orientated, and collaborative service-offerings. As a consequence, also the related research contributions remain relatively silent. Structured in four different research perspectives and based on two empirical Open Government community projects (which were planned, developed and managed by the author of this PhD thesis), the results enrich various existing streams of literature and provide, in addition, manifold implications for practitioners. The following paragraphs outline the main insights of this PhD thesis:

(1) User and Motivation Perspective: We found that a general interest in the public sector and its challenges is the main driver for an active engagement, followed by the interest in the crowdsourcing community itself with its variety of like-minded people (sense of community). As a third driver for active participation we found disenchantment with the current political climate and a desire to actively improve the overall political situation.

(2) Experience and Relationship Perspective: Drawing on deliberative theories of democracy and experiential learning theory, the results show that Open Government platforms may be interpreted as new affordances forming democratic citizens. One important finding indicates that the “valuable platform experience” should be understood as a second order factor, consisting of “task enjoyment” and overall perceived “platform usefulness”. Further, governmental crowdsourcing initiatives seem to serve as a fruitful enabling and learning environment to turn citizens more democratic, by qualifying them to further develop their social, political, intellectual skills. In addition, the participation experience increased the perceived feeling to be close to politics and thereby being empowered. Further, the paper indicates that a valuable platform experience has a significant impact on real platform behavior, measured by the number and quality of contributions.

(3) Community Perspective: In a separate research effort, we focused on analyzing the community structure of one of our two empirical cases. Our findings confirm that public sector crowdsourcing platforms should consist of a heterogeneous participant community. The different community

roles and their time-related composition and activities seem to influence the community growth as well as the output. Relying on network theory related patterns, we identified five different community roles.

(4) Platform and Technology Perspective: In a fourth research effort, a design science-based framework for a citizen-oriented virtual co-creation system was developed, aiming at deducing relevant design principles. The key insights clearly show that system designers need to design co-creation environments that move beyond a discussion of different functionalities or the mere “exchange” relationships. They need to ensure that the technical system supports the self-selected diverse group of “knowledgeable citizens” to contribute various perspectives towards a policy problem and, most important, that these citizens engage in a collaborative process of recombination, integration, and refinement of policy ideas through dialogue as well as content enrichment. The deduced design principles contribute to three different dimensions: First the systemic dimension, focusing on technical functions, user interface design, and various mechanisms within the co-creation system. Second, the process dimension consisting of design principles, which focus on planning, recruitment, community management, and content evaluation. Third, the stakeholder-related dimension with design principles related to the community, the integration of experts, or policy makers.

The *extended synopsis* links the empirical findings of the research articles to the following streams of theories and bodies of knowledge: Theory of democracy, public administration theory, political communication theories, community and network theories, and technology as well as tool-orientated streams of literature. Based on the theoretical underpinnings, ten fundamental principles were deduced, which may serve as an initial framework for a theory of Open Government communities. Overall, the results of this PhD thesis provide a useful portfolio of theoretical as well as practical insights, which can help potential platform providers to successfully use Open Government communities for fostering civic engagement in more collaborative system environments and thereby provide a new way of solving the initially introduced social challenges.

Zusammenfassung der Ergebnisse

Die komplexen sozialen Herausforderungen der heutigen Zeit stellen oft die Struktur der modernen Gesellschaft und der ihr zunehmend entfremdeten Bürger in Frage und rufen tiefliegende Spannungen zwischen der Gesellschaft und dem Regierungssystem hervor. Diese Dissertation zeigt, wie Informations- und Kommunikationstechnologien im Allgemeinen und „Open Government Communities“ im Besonderen, dazu beitragen können, ganz neue Möglichkeiten für bürgerschaftliches Engagement in virtuellen und kollaborativen Systemumgebungen systematisch zu fördern. Im Gegensatz zum privaten Sektor, in dem sich community-basierte Ansätze bereits als beliebte dezentralisierte und partizipatorische Strategien etabliert haben, zögerte der öffentliche Sektor länger mit offeneren, bürgerorientierten und kollaborativen Serviceangeboten. Folglich ist auch die Anzahl der Forschungsbeiträge zu diesem Thema noch relativ gering. Hier werden zwei empirische Open Government Communities untersucht (die vom Autor dieser Dissertation maßgeblich geplant, entwickelt und betreut wurden) und unter Berücksichtigung von vier unterschiedlichen Forschungsperspektiven ausgewertet und diskutiert. Die Ergebnisse ergänzen und erweitern verschiedene Theorien und bieten gleichzeitig vielfältige Implikationen für Praktiker. In den folgenden Paragraphen sind die wichtigsten Ergebnisse zusammengefasst:

(1) Nutzer- und Motivationsperspektive: Die Ergebnisse zeigen, dass ein allgemeines Interesse an politischen Fragestellungen und den damit verbundenen Herausforderungen das stärkste Motiv für eine aktive Teilnahme an einer Open Government-Community ist. Ein ähnlich starkes Motiv ist das Interesse an der Crowdsourcing-Community selbst, mit ihrer großen Zahl an ähnlich- oder gleichgesinnten Personen („sense of community“). Als drittichtigstes Motiv für die aktive Teilnahme wurde die Unzufriedenheit mit der Politik und ein damit verbundenes Interesse, die politische Situation aktiv verändern zu wollen, identifiziert.

(2) Erfahrung und Beziehungsperspektive: Vor dem Hintergrund der deliberativen Demokratietheorie sowie der experimentellen Lerntheorie, bieten Open Government-Communities neue Möglichkeiten, Bürger im demokratischen Sinne zu bilden. Ein wichtiges Resultat zeigt, dass die Teilnahme-Erfahrung an der Open Government-Community als Einflussfaktor zweiter Ordnung interpretiert werden sollte, der sich aus der wahrgenommenen „Freude an der Aufgabe“ und der „Nützlichkeit der Plattform“ zusammensetzt. Ferner scheinen Crowdsourcing-Initiativen im öffentlichen Sektor als wertvolle Lernumgebung für Bürger zu dienen, demokratische Fähigkeiten zu erlernen und diese weiter zu entwickeln, indem sie soziale, politische und intellektuelle Kompetenzen erwerben. Darüber hinaus verbessert die aktive Teilnahme-Erfahrung an einer Crowdsourcing-Community im öffentlichen Sektor die subjektive

Wahrnehmung, Möglichkeiten zu haben, am politischen Geschehen teilzunehmen. Überdies konnte gezeigt werden, dass eine positive Teilnahme-Erfahrung einen signifikanten Einfluss auf das tatsächliche Verhalten in der Community hat, was sich durch die Anzahl und Qualität der Beiträge zeigte.

(3) *Community Perspektive:* In einem weiteren Forschungsprojekt stand die Analyse der Community-Struktur von einer der beiden empirischen Fallstudien im Vordergrund. Die Ergebnisse bestätigen, dass Crowdsourcing-Plattformen auch im öffentlichen Sektor aus heterogenen Teilnehmer-Communities bestehen sollten. Die unterschiedlichen Community-Rollen und ihr zeitliches Zusammenspiel bzw. ihre Aktivitäten, scheinen das Community-Wachstum zu determinieren und die auf der Plattform gewonnen Inhalte zu beeinflussen. Mit Hilfe von Netzwerkmodellen konnten wir fünf unterschiedliche Community-Rollen identifizieren und beschreiben.

(4) *Plattform- und Technologie-Perspektive:* Im vierten Forschungsprojekt wurde ein bürgerorientiertes, virtuelles Co-Creation-System entwickelt, das auf dem Konzept der „Design Science Theory“ basiert. Die zentralen Ergebnisse zeigen deutlich, dass Systemdesigner Co-Creation-Systeme entwickeln müssen, die über die alleinige Diskussion von Funktionalitäten bzw. die Fokussierung auf den kommunikativen Austausch hinausgehen. Systemdesigner müssen sicherstellen, dass eine selbstselektierte Gruppe von Bürgern während der aktiven Teilnahme unterschiedliche Möglichkeiten zur Problemlösung hat. Das gesamte System sollte den kollaborativen Prozess eines Neukombinierens, Integrierens, oder Verfeinerns von politischen Ideen/Beiträgen durch die Möglichkeiten des Dialogs unterstützen. Deshalb lassen sich die abgeleiteten Designprinzipien drei Dimensionen zuordnen: Erstens der systembezogenen Dimension, die sich auf technische Funktionen, Benutzeroberflächen oder andere technische Vorgänge auf der Co-Creation-Plattform bezieht. Zweitens der prozessbezogenen Dimension, bestehend aus Planungs-, Rekrutierungs- und Community-Management sowie Auswertung der Inhalte. Drittens, der Stakeholder-bezogenen Dimension, die sich auf die Community selbst, beteiligte Expertennetzwerke oder auch die Politik bezieht.

Die *erweiterte Synopsis* verbindet die empirischen Ergebnisse der vier Forschungsartikel mit den nachfolgenden Theorien respektive weiteren Literaturperspektiven: Demokratietheoretische Ansätze, Theorien der Verwaltungswissenschaften, Theorien der politischen Kommunikation, Community- und Netzwerktheorien und technologie- und plattformbezogene Ansätze. Auf den theoretischen Erkenntnissen aufbauend wurden in der Synopsis zehn grundlegende Prinzipien entwickelt, die als erster Rahmen für eine Theorie von Open Government-Communities dienen können. Zusammenfassend bieten die Ergebnisse dieser Dissertation damit sowohl einen theoretischen als auch einen praktischen Erkenntnisgewinn und unterstützen zukünftige

Plattformanbieter dabei, erfolgreiche Open Government-Communities aufzubauen. Letztere können wiederum dazu beitragen, das bürgerschaftliche Engagement in kollaborativen Systemumgebungen zu fördern und somit neue Lösungsformen für die sozialen Herausforderungen der heutigen Zeit zu finden.

Annex B

List of Research Articles and Status of Publication

Research Article I

Titel: Why Do Citizens Engage in Governmental Crowdsourcing Initiatives? Motives and Their Impact on Participation Behavior

Authors: *Koch, G.; Hutter, K.; Füller, J.; Hilgers, D.*

Status: Not yet published / under review

Research Article II

Titel: How Open Government Platform Experience Shapes Citizens Democratic Skills, their Perceived Political Empowerment & Actual Participation Behavior

Author: *Koch, G.*

Status: Not yet published

Research Article III

Titel: Identifying Participants' Roles in Open Government Platforms and its Impact on Community Growth

Authors: *Koch, G.; Hutter, K.; Hilgers, D.; Füller, J.*

Status: Not yet published / under review

Research Article IV

Titel: Beyond Participation: Design Principles for Citizen Co-Creation Systems

Authors: *Koch, G.; Brunswicker, S.; Füller, J.*

Status: Not yet published / under review

Annex C

Research Article I

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Why Do Citizens Engage in Governmental Crowdsourcing Initiatives? Motives and Their Impact on Participation Behavior

Abstract

The discussion of crowdsourcing has rarely touched upon the public sector. This paper aims to elucidate citizens' motives for engaging in online participation platforms and further investigates the impact of these motives on contribution behavior. Surveying 437 citizens who participated in the online crowdsourcing initiative 'Aufbruch Bayern' initiated by the Bavarian prime minister's office and analyzing their motive structure as well as their contribution behavior reveal that citizens' motives for engaging in governmental crowdsourcing initiatives significantly differ between active and less active citizens. Aside from the theoretical contribution, we discuss managerial implications in terms of the actions that public institutions can take to create a vibrant online platform.

Key Words

Crowdsourcing, Citizen Engagement, Online Participation, Motivation

Introduction

The active engagement of thousands of Internet users in companies' value-generating activities has become a mainstream business practice. Especially during the early stages of the new product development process, companies often rely on crowdsourcing as a means to generate new product and service ideas or problem solutions by interacting and collaborating with external stakeholders (Howe 2008; Schweitzer et al. 2012). Crowdsourcing refers to a company's outsourcing of a function once performed by employees to an undefined (and generally large) network of people in the form of an open call on the Internet (Howe 2008). The call may relate to product or service ideas, new business models, design concepts, or user-generated ad campaigns within various industries and branches.

Similar to the above-mentioned new product development process, crowdsourcing may also contribute valuable input when citizens take an active role in the different stages of a government's new policy development process (Mergel and Desouza 2013; Nowlin 2011). Especially during the first two stages of *citizens' need identification* and *policy ideation*, a more systematic crowdsourcing-based integration of citizen's needs, knowledge, and experiences appears to be possible (Hilgers and Ihl 2010). Later stages, such as *policy evaluation*, *policy experimentation*, and eventually *policy implementation*, may also benefit from crowdsourcing, but those phases will not be the focus of this paper (Brunswicker, Almirall, and Lee 2013; Skok 1995). Research indicates that unknown outsiders, such as users, consumers, suppliers, or experts, can constitute an important source for online-based value-creation in corporate contexts (Boudreau and Lakhani 2013; Füller and Mühlbacher 2005; Schweitzer et al. 2012); similarly, a large body of research exists addressing face-to-face or offline citizen participation in the public sector, such as holding town hall meetings, roundtables and speeches, to mention just a few (Blomgren Bingham, Nabatchi, and Rosemary 2005; Lukensmeyer and Brigham 2002; Yang and Pandey. 2011). Furthermore, we identified an extensive stream of literature addressing citizens' motives for actively using rather static eGovernment offerings (Dimitrova and Chen 2006). At the same time, we observe that public sector institutions have been generating almost uncountable practical cases of citizen-sourced crowdsourcing activities as, for instance, listed on www.participedia.net. From a research perspective, however, there is hardly any research focusing on public sector institutions working with *online-based* and *collaboration-orientated* production, delivery and even allocation of goods by citizens to citizens (Collm and Schedler 2012).

Consequently, this paper aims to add theoretical as well as empirical insights to the research field of *online-based citizen participation*. To specify the research topic, we define online-based citizen

participation as the ability of the public administration to virtually engage with citizens, to share resources that were previously closely guarded and thus to harness the power of mass collaboration as well as drive transparency (Lathrop and Ruma 2010). Recently, an increasing number of governmental institutions, interest groups, and non-profit organizations have considered a shift towards more collaborative approaches for citizen integration (Osborne 2006), and they are increasingly taking advantage of citizen networks and new types of virtual platforms to enhance public value creation (Osborne and Brown 2005; Walker 2003). Those new participation modes are believed to increase mutual decision making and value creation and may finally conclude in new forms for state and citizen relationships (Hilgers and Ihl 2010; Moore 1995; Pierre and Peters 2003). Hence, citizens are no longer seen as rather passive stakeholders, only able to intervene every election day, but as more active and thus enabled actors with varied possibilities for participative democratic involvement (Lips, Taylor, and Organ 2009; O'Neill 2009). Adopting the latest online opportunities and following the New Public Management philosophy (Dunleavy and Hood 1994), many public sector innovations are now focused on giving citizens more “customer voice”, more choice, and the service quality they deserve. As a consequence, online citizen participation needs citizens who are motivated and committed to actively contributing to valuable outcomes (Bommert 2010; Brabham 2012). To our knowledge, no study exists to date exploring why citizens engage in governmental crowdsourcing initiatives and how different sets of motives may influence the actual participation intensity during the need identification and ideation phase of the new policy development process.

Hence, the aim of the study is twofold:

1. What motivates citizens to engage and submit their ideas, comments, and evaluations in reaction to an open call for contribution in governmental crowdsourcing initiatives?
2. How do the identified motives affect community members' actual participation behavior?

Our paper is structured as follows: we briefly introduce the roles of social media and crowdsourcing and discuss the relevant motivation theory to better understand potential drivers that affect citizens' participation in governmental crowdsourcing initiatives. Then, we present the design of our study and the results of our analysis. Finally, we conclude with a discussion of the theoretical and practical implications of our findings.

Governmental crowdsourcing and related motives

The emergence of social networks, wikis, and other tools promoting user-generated content strengthen the perceived power of crowdsourcing and the view of users as motivated, active and productive external knowledge carriers (Buhl 2011; Kaplan and Haenlein 2010; Palfrey and Gasser 2008). In fact, Web 2.0 applications are at their core based on openness, participation, conversation, interaction, connectedness and the ability of any Internet user to create and exchange his or her own content (Kaplan and Haenlein 2010). These new tools support large-scale communication, efficient information sharing, and the coordination of largely and often un-organized actors. Furthermore, those tools allow or even motivate interaction, collaboration, and discussions. Meanwhile, the potential impact to be gained from interaction with a broad variety of individuals during value creation processes in general has widely been recognized, at least in industry contexts (Auer 2011; von Hippel 1988; Lakhani and Wolf 2005; Thomke and von Hippel 2002). Generally, crowdsourcing highlights that external sources should not be perceived purely as “value receivers” but also as important “value generators” (Howe 2008) because they are able to contribute their personal point of view, including user experience as well as knowledge; these contributions provide an additional dimension, reaching beyond the pre-defined perspectives of a responsible team within an organization (Chesbrough 2003). The increasing number of crowdsourcing examples proves that it is a valuable approach in the fields of innovation management, marketing (Brown, Broderick Amanda, and Lee 2007; Füller 2010; Kozinets et al. 2010), strategy (Stieger et al. 2012), and, most recently, the public sector (Hilgers and Ihl 2010).

Drivers for political (offline) participation

In opposition to the rapidly growing number of practical cases, theoretical contributions addressing citizens’ motives for interactive and collaborative political online participation are scarce. To build our research effort on a well-developed theoretical foundation, we will consider and discuss theoretical insights on *political participation in general*, followed by research on drivers for *political offline participation* and citizens’ motives for using the rather new offerings of *public eGovernment services*. Afterwards, we will introduce a set of motives especially designed for *collaborative online governmental crowdsourcing* activities. This step appears to be necessary because today’s social media-driven crowdsourcing offerings provide more interactive and collaborative possibilities for promoting ideas, concepts and political positions, easily initiating virtual discussions or mobilizing around currently relevant topics (Collm and Schedler 2012; Rogers, Collins-Jarvis, and Schmitz 1994). These new methods share online collaborations and dynamic interactions as a common

characteristic and therefore inherently need participants who are motivated and committed to generate valuable outcomes.

To start with drivers for political participation in general, Brady et al. (1995) found that time, money, and civic skills are the most important enablers of political participation. Civic skills appear to be closely connected to socioeconomic status and are operationalized as general communication and organizational capacities that are essential for participating in political activities. In more detail, Brady et al. (1995) mentioned the ability to speak and write as well as to organize and take part in (political) meetings. This dimension is connected with general learning abilities because it starts in childhood and continues through working life. Further, Schlozman et al. (2010) found only little evidence that growing Internet usage has fundamentally changed the influence of the above-mentioned enablers of political participation. With reference to the age distribution, on the one hand, Internet usage has the potential to ameliorate the participation rate of younger citizens and, on the other hand, it can present a challenge in motivating the older generation (c.f. the digital divide appears to be significant) (Benner 2002; Schlozman, Verba, and Brady 2010). With regard to general political participation behavior, only the already active citizens (e.g., offline formats) appear to demonstrate enhanced participation due to virtual offerings. The thesis of a reinforcing rather than an activating influence from the Internet on citizen's general political participation proves to be true (Margolis and Resnick 2009).

Political participation has typically been understood as individual- or group-related political activities in *offline settings*, including, for instance, active attendance at public meetings, writing letters to officials, participating in political rallies, or going to the polls (Nabatchi 2012; Rosenstone and Hansen 1993). Irvin and Stansbury (2004) summarize, for instance, the advantages as well as the disadvantages of increased citizen participation in the political decision making process and the outcomes of policy development. From their findings (advantages for citizens), we may assume that the identified dimensions, such as obtaining education, gaining skills, breaking gridlocks or contributing to a better policy implementation, may be interpreted as drivers for citizens' offline participation (Irvin and Stansbury 2004).

The third stream of literature refers to the steadily increasing number of eGovernment publications. These research studies examine how digital technologies allow increased transparency (Brandsen and Pestoff 2006; Carter and Bélanger. 2005; Dimitrova and Chen 2006; Meijer, Grimmelikhuijsen, and Brandsma 2012; Raus, Flügge, and Boutellier 2009). For instance, Dimitrova and Chen (2006) identified crucial factors for online civic engagement through eGovernment offerings, mentioning

demographic characteristics, civic mindedness, psychological factors, and information channels used. To compare the *eGovernment* and the *governmental crowdsourcing* approach, which were both triggered by the emergence of the Internet, we developed table 1.

Table 1: *Structural differences between eGovernment and governmental crowdsourcing*

	eGovernment	Governmental Crowdsourcing
Characteristics	Presentation & Information (virtual front office)	Open Call for Participation, Interaction, and Collaboration
Mode of Interaction	Dyadic Transaction	One to Many (Collaborative or Competitive)
Mode of Cooperation	Formal (e.g., mandatory tax declaration)	Informal, Spontaneous (Lathrop and Ruma 2010)
Granularity of Task	Specific and Individual	Generic, Creative, Open
Information Input	Process Information	Problem, Solution and Need Information
Motivational Stimuli of Participants	Speed, Efficiency, Individual, Improved Information Channel (Dimitrova and Chen 2006)	<i>Research Gap addressed in this paper</i>
Results	Administrative Efficiency (Cordella 2007)	Decision Support by Participation, Disclosure of Expert Knowledge (Noveck 2009)
Impact	Service Quality (Moon 2002) Attitudes about Government (Kim and Lee 2012; West 2004), Operational Capacity	Innovation and Creative Capacity (Collm and Schedler 2012), Transparency (Fung and Weil 2010), Legitimacy and Trust (Nam 2012)
Tools	Static Website, Online Forms, and Proprietary Software	Communities, Innovation and Ideation Contest, Toolkits, Open Data Interface

This comparison shows how substantial the structural differences between eGovernment and the governmental crowdsourcing approach are. When focusing on governmental crowdsourcing initiatives, which are typically considered to be more interactive, collaborative, and content-oriented formats than eGovernment activities, the question of motivation plays an even more crucial role (Lathrop and Ruma 2010). Only when individuals are willing to engage in crowdsourcing projects and are enabled to share their ideas, honestly state their preferences, and comment on existing concepts can valuable contributions that lead to significantly better results be expected. In the following, we will therefore elucidate motivation theory as well as empirical study results on motivational forces to obtain a better understanding of the potential drivers that affect citizens' participation in online public sector crowdsourcing activities (Brabham 2012).

Motivations for Virtual User Engagement

The reasons why users and consumers take part in online crowdsourcing activities may be manifold and originate from different sets of motives. Engaging in activities and tasks can be considered to be a function of intrinsic and self-determined extrinsic motivation (Deci and Ryan 1985).

Intrinsic Motivation: Hobbies such as playing chess, dancing salsa, rock climbing, or gardening are considered to be playful, interesting, challenging, and exciting activities often performed for their own sake (Deci and Ryan 1985). Intrinsically motivated individuals may consider their virtual contribution to collaborative activities as playful and enjoyable and therefore perceive it to be rewarding instead of taxing. It is not the outcome but the activity itself that creative consumers may derive benefit from. These types of individuals show a positive attitude towards and are interested in Internet-based co-creation activities. The reason for intrinsic motivation is an individual's need to feel competent and self-determining in addressing his or her environment (Deci and Ryan 1985).

Extrinsic Motivation: Consumers are extrinsically motivated if they focus on contingent outcomes that are separable from the activity per se (Deci and Ryan 2002). Deci and Ryan (2002) distinguish between 'informational' and 'controlling' extrinsic motivators, depending on the effect on intrinsic motivation. 'Informational' extrinsic motivators that increase someone's sense of competence, need to find a creative solution, or prevailing task involvement are considered to be an additional bonus and to encourage activity, reinforcing someone's intrinsic motivation. 'Controlling' extrinsic motivators, such as status or job promotion, confine self-determination and are considered to be counterproductive because they undermine initial intrinsic motivation (Deci and Ryan 2002).

Drawing on the rich body of research founded in related fields such as leisure (Ozinga 1999), online communities (mainly open-source projects) (David and Shapiro 2008; Hars and Qu 2002; Henning-Thurau et al. 2004; Hertel, Niedner, and Herrmann 2003; von Krogh et al. 2012; Lakhani and Wolf 2005), virtual communities of practice (Daugherty et al. 2005; McLure Wasko and Faraj 2005), as well as user innovation communities and virtual consumer integration (Nikolaus Franke and Shah 2003; Füller 2010), a number of motives are identified and described in Table 2.

Table 2: Intrinsic and Extrinsic Motivation in Open Innovation Settings

Intrinsic Motivation	Autotelic - Playful Task	Individuals engage in tasks because the activity itself is considered to be rewarding. Consumers involved in innovation tasks for a particular product category (Bloch 1986) or brand (Coulter, Price, and Feick 2003; Mittal and Lee 1989) may engage in virtual product development.
	Curiosity – Exploration – Arousal Seeking	Curiosity may be defined as the desire for knowledge for intrinsic reasons (Berlyne 1960). People gain intrinsic satisfaction from relieving curiosity (Unger and Kernan 1983). Consumers may engage in virtual new product development just because they are curious or because they want to escape boredom.
	Achievement – Challenge – Self Efficacy	The opportunity to prove someone’s self-efficacy drives consumers to innovate on the Internet (Kollock and Smith 1998). Consumers that are optimistic about their capabilities to solve a particular task and cope with anticipated difficulties may perceive the activity as a challenge to be mastered.
	Skill Development – Knowledge Acquisition	People are motivated to perform an activity because they are striving to improve their skills and gain additional knowledge (Amabile 1996; Deci and Ryan 2002). Users get in contact with their friends, peer group members, and producers because they look for complimentary knowledge and the professional support needed to advance their own ideas (von Hippel 2002; Lakhani and Wolf 2005).
	Information Seeking	Prior studies show that people participate in online communities because they are looking for information relevant to them. According to Butler et al. (2008), online communities offer the ability to gain access to otherwise obscure or inaccessible information (Butler et al. 2007).
	Recognition – Visibility	Consumers may participate in virtual new product development to become visible and gain recognition from other participants as well as from the producer. Online community members share their know-how and participate in activities connected to effort for ego gratification motives, fame, and reputation (Henning-Thurau et al. 2004). Further, consumers derive benefits from building up direct relationships with companies due to special treatment, self-esteem, and the reduction of uncertainty (Gwinner, Gremler, and Bitner 1998).
	Altruism – Community Support	Altruism can be defined as “doing something for another at some cost to oneself” (Ozinga 1999, p. 5). A lively debate is ongoing as how to define altruism. Without going into the definitions in more detail, altruism may motivate consumers to virtually engage (Henning-Thurau et al. 2004).
	Make Friends	Beneath the interest in the topic, the possibility of getting in contact with like-minded people is one primary reason why consumers engage in virtual communities (Kozinets 2002). Moreover, Gwinner et al. (1998) note that consumers interacting with companies interpret their relationship with employees as being similar to friendship.
	Personal Need – Dissatisfaction	Sports enthusiasts start to modify or develop their own products because they derive benefit from using their innovation integration (Nikolaus Franke and Shah 2003). These types of lead users develop their own products because they are dissatisfied with existing products available on the market and because they expect attractive innovation-related benefits from a solution to their leading-edge needs (von Hippel 2002).
Extrinsic Motivation	Compensation – Monetary Reward	Immediate as well as delayed payoffs may be the reason why consumers engage in innovation activities. Consumers engaging in virtual new product development may be interested in the offered monetary incentives such as giveaways, bonus points, prize drawings or monetary compensations delivering immediate benefit (von Hippel 2002).

The Impact of Motives on Contribution Behavior

Research not only focuses on the individual motivational aspects that lead individuals to engage in a collaborative activity but also relates these to other variables such as the contribution context,

behavioral patterns, personal values and personal attributes, which are all characteristics of the individual contributor (David and Shapiro 2008; Oreg and Nov 2008). The study by Oreg and Nov (2008), for example, showed that participants in the software context tend to have higher mean scores for reputation-building and self-development motivations, whereas participants in the content context tend to be higher in altruistic motivations. David and Shapiro (2008) further show that community members are rather heterogeneous in their motive structures and that the various motivational profiles of developers significantly influence the developer's preference for different-sized projects as well as the actual participation behavior and role within the community (David and Shapiro 2008). Butler et al. (2007) found that the motives of community owners significantly differ from those of active and silent participants; social and altruistic motives are much more important for them than they are for active or silent participants. In turn, information motives are much more important for silent participants than for the other two groups. Further, motives also significantly impact the participants' activity level, community-building work, and type of contribution, such as total time spent, social encouragement, content provision, or participation in discussions.

These insights may also offer valuable hints for online crowdsourcing activities in the public sector by governmental agencies and public administration (Brabham 2012). We assume that motives may influence the level as well as the type of participation. In more detail, we expect that motives will impact the submitted ideas, comments, and evaluations. Consistent with previous findings (see for example Füller et al. forthcoming), we assume that the most active participants may be primarily driven by intrinsic motives. Knowing the major drivers and motives for visiting, joining and actively participating in open government platforms may further support open governmental initiatives to obtain high participation and high quality contributions.

Method

Research Setting

'Aufbruch Bayern' was initiated by the Bavarian prime minister's office. As a part of the executive authority, this office belongs to the highest level of public administration in the German federal state. The overall aim was to actively integrate Bavarian citizens into the collaborative ideation process, to increase awareness of these policy areas, and to establish a closer relationship between the governmental institution and the citizen. The initiative represents a unique open government project

due to its scope, the functionality of the platforms, the number of participants and the output of the open government initiative

This online platform was activated from the 15th of June to the 15th of August in 2010. It focused on three fields of politics in Bavaria: family, education and innovation; citizens could register and post their ideas regarding these prescribed topics. Moreover, they could comment and evaluate the ideas of other citizens. In total, the platform counted 2,100 active participants and more than 100,000 visitors. A total of 740 ideas were created during the two months, which resulted in 1,540 pages of content. The community wrote 6,342 comments and made 10,932 evaluations. In total, the community spent 760 working days on the platform, which accounts to more than 364,800 minutes of residence time.

Because the implementation was realized with an online platform, the authors had access to a large set of collected data. Data such as log files (visits, and activity per user), user data (usernames, user ID, sent and received messages on profiles), and information on designs (graphics, number of received comments, number and average of received evaluations) were exported from the platform system database (MySQL). These data include structured, semi-structured and unstructured data and is the major source for our single case study research. Data such as comments, contributions and ideas were thoroughly analyzed and assessed by the research team. This work was complemented with a post-project online survey, project observations and the experiences of the individual researchers when directly interacting with participants.



Figure 1: Online Dialog Homepage "Aufbruch Bayern"

Data Sources and Data Collection

A multi-method approach (Tashakkori and Teddlie 1998) including qualitative as well as quantitative data was applied. The strength of mixed method research lies in the holistic way it answers research questions. Hence, mixed method research helps to offset the disadvantages that certain methods have on their own, thereby avoiding common method bias, and offers the possibility of falsification as well as stronger inferences (Podsakoff and Organ 1986). To assess the impact of motives on the intensity of citizens' contributions, we drew on quantitative surveys and log-file data. To avoid common-method bias, the independent and dependent variables in our quantitative analysis were also collected from multiple sources and through different methods (Podsakoff et al. 2003). The independent variables, including citizens' motivations, were operationalized through self-reports obtained via an online questionnaire. The dependent variables regarding citizens' contribution intensity, in contrast, were operationalized by capturing actual participation activities in the log-file data of the platform server.

Online Survey: Based on the literature and the motivations emerging from the in-depth interviews with the citizens and experts, an online survey was launched after the crowdsourcing initiative. After an online pre-test with 25 participants, data collection with the final questionnaire was conducted over a period of two weeks in October 2010. A total of 2,094 emails with unique referrer links were sent, and 437 complete questionnaires were returned; this corresponds to a response rate of 21%. Respondents received no incentives for answering the survey; furthermore, the questionnaire was provided in German. To test a possible non-response bias, the means of the early and late respondents were compared, and no significant differences were found. Therefore, non-response bias does not appear to be a problem (Armstrong and Overton 1977). Within the survey sample, 60.8% of the respondents are male, 39.2% are female. Moreover, 7% can be described as immigrants in contrast to approximately 80% German participants. On average, 21% of the participants in the survey had a secondary school qualification and almost 70% had a high school diploma. Over 75% (Mean = 4.2; SD = 1.7) of the participants indicated that they go regularly to the polls. Finally, the majority of the survey participants can be described as loyal voters (Mean = 3.0; SD = 1.8) and as experienced in political issues (Mean = 1.7; SD = 0.9). The questionnaire included 12 motive items adopted from Füller (2010), which were slightly adjusted to the political context (see Table 2). All items were measured with a 5-point Likert scale anchored by (1) "strongly disagree" and (5) "strongly agree".

Table 3
12 Motive Items Ordered According to Strength of Participants' Agreement

I participated in the “Aufbruch Bayern” dialogue platform because...	Mean	SD
... I want to push/advance Bavaria.	1.78	.97
... I am interested in political issues.	1.79	1.00
... I like to get involved in favor of the common welfare.	1.81	.88
... I want to improve the politics currently dominating the Bavarian state government.	1.82	1.07
... it enables me to address political issues.	2.02	1.07
... I like to introduce my suggestions within the scope of a public discussion.	2.07	1.08
... I am dissatisfied with the current political situation.	2.22	1.21
... I was curious.	2.26	1.26
... I want to help other members by contributing to relevant discussions.	2.38	1.17
... I want to support the Bavarian state government.	2.75	1.27
... I enjoy meeting like-minded people.	3.17	1.31
... I have previously participated in similar platforms.	3.96	1.30
N= 437		

Log File Analysis: Contribution behavior was captured through three count variables: *number of contributed ideas*, *number of comments*, and *number of evaluations*. To measure the actual number of contributed ideas, comments, and evaluations, we analyzed the log file of the server, which logs anything happening on the community platform. We, of course, considered and were in compliance with the data privacy protection regulations for performing this type of analysis. All examinations were conducted on the aggregated level; data were treated on an anonymous level, where no information can be traced back to the individual contributor.

Findings

Overall, this online ideation process for Bavaria’s citizens was well received and demonstrated high participation (please consider the community figures described in the chapter “research setting”). This high commitment of time indicates the high interest of citizens in being actively involved in governmental problem solving activities. It shows that citizens should not be treated just as taxpayers or receivers of public services but rather as active participants and problem solvers in a governmental context. The fact that more than 100,000 viewers showed up on the interactive dialogue-platform during the two months demonstrates the impact of this open government initiative.

To ensure a valid interpretation of results and discussion, we conducted a number of statistical tests, which will be subsequently discussed. A principal component analysis with varimax rotation was performed on the 12 items. Using Kaisers' eigenvalue-one criteria, a three-factor solution was extracted. All items that did not load high on any factor (> 0.5) or with high cross loadings (> 0.40) were eliminated. Based on these criteria, three of the 12 items were deleted. Using the Kaiser-Mayer-Olkin (KMO) measure for sampling adequacy ($KMO = .711$) and Bartlett's test of sphericity ($p = 0.000$) indicated the appropriate application of factor analysis. Coefficient alpha and split-half testing was used to test the reliability of factor scores. While satisfactory factor reliability should exceed $.70$, values decreasing to $.55$ are acceptable, especially for exploratory research (Hair et al. 2010). Therefore, we retain the identified motivational factors "community interest" and "need for improvement" for further analysis, accepting the caveat of a somewhat lower reliability for these two constructs. Table 4 presents the final factor solution with the factor loadings and Cronbach's α . As the exploratory factor analysis shows, citizens may engage in open government platforms for three reasons: a) interest in politics: citizens show an intrinsic interest in the discussion of political issues and the generation of ideas for potential solutions, b) interest in the platform/community: citizens are not only interested in the political topic but also in the offered platform and the people who frequent such communities and c) need for improvement: citizens engage in political dialogue because they are dissatisfied with the current politics and are aiming to improve this situation.

Table 4
Summary of Exploratory Factor Analysis and Scale Reliability

	Factor Loading	Alpha (α)
Public Sector Interest		.72
... it enables me to address political issues	.80	
... I want to push/advance Bavaria	.71	
... I like to introduce my suggestions within the scope of a public discussion	.70	
... I am interested in political issues.	.65	
Platform / Community Interest		.58
... I was curious	.74	
... I enjoy meeting like-minded people	.72	
... I have previously participated in similar platforms	.70	
Need for Improvement		.60
... I am dissatisfied with the current political situation	.92	
... I want to improve the politics currently dominating the Bavarian state government	.68	

Logistic regression analysis was conducted to determine the influence of the different motives on citizens' contributions. Contributed ideas, comments, and evaluations served as dependent variables with the value 0 as no contribution and 1 as at least one contribution. Table 4 shows results of the logistic regression analysis, indicating that public sector interest is the main driver of citizens' active contribution to open government platforms. Public sector interest has a significant influence on the probability of submitting an idea as well as submitting a comment. While interest in the platform/community and need for improvement as further identified motivators have no significant influence on the probability of submitting an idea or a comment, they do have a significant influence on the probability of contributing evaluations. Political interest has no significant influence on the probability of contributing an evaluation.

Table 5
Summary of Regression Analysis: Contributed Ideas/ Comments/ Evaluations

Independent Variables	Dependent Variables		
	Contributed Ideas	Contributed Comments	Contributed Evaluations
Factor 1: Public Sector Interest	.512 ***	.456 **	.096 n.s.
Factor 2: Platform/Community Interest	.106 n.s.	.019 n.s.	.193 †
Factor 3: Need for Improvement	.093 n.s.	.071 n.s.	.229 *
Chi ²	15.567 **	8.795 *	6.115 †
-2log likelihood	536.645	516.612	489.196
Cox & Snell R ²	.037	.021	.015
Nagelkerke R ²	.050	.029	.021

† p< 0.1; * p<0.05; ** p < 0.01; *** p<0.001

Discussion and Implications

The contributions of our research effort are manifold. First, on a rather general level, the experiences gained during our investigation of the described case study and our descriptive statistics show that a crowdsourcing approach may offer a promising opportunity to access, absorb, and integrate citizen knowledge and experience into the first stages of a new policy development process. Second, our research enables a better understanding of the motive structures of citizens who participate in public sector crowdsourcing initiatives. Our results show that citizens appear to engage in online governmental crowdsourcing initiatives for three primary reasons: (1) a general interest in the public sector and its topics, (2) an interest in the platform community and (3) a disenchantment with current politics and an aim to improve the overall political situation. While the three motive dimensions belong to intrinsic motivation, our study also shows that extrinsic motivation in the form of monetary compensation appears to be insignificant. Third, online participation platforms appear to be especially attractive for citizens who show a certain interest in political debates. This reinforcing, rather than

mobilizing, effect of the public sector crowdsourcing platform supports insights from offline settings in that citizens who are politically engaged in parties or community groups are more likely to attend political discussions (Margolis and Resnick 2009; Rosenstone and Hansen 1993). This argument is also supported by insights drawn from the logistic regression analysis, where public sector interest appears to be the main driver of citizens' active contributions, while interest in the platform/community itself as well as need for improvement have no significant influence on the probability of submitting ideas or comments. Consequently, we conclude that already interested citizens appear to have greater expertise and a better understanding of the opportunities that online platforms may offer, and they appear to be more capable of contributing. These results were also supported by the Bavarian State Government, which concluded that they were able to obtain new knowledge that was hidden, dislocated and unavailable when they used traditional approaches. Fourth, our research effort suggests insights on how the different motives influence citizen's contribution behavior, thereby adding both the individual motivational aspects as well as the contribution context and behavioral patterns to previous literature (David and Shapiro 2008; Füller et al. forthcoming; Oreg and Nov 2008). Citizens who are more interested in the crowdsourcing activity itself or are feeling a need for improvement could be described as more passive users in regard to contributing ideas and comments. These users tend to read and evaluate the content of other contributors. Nevertheless, these citizen groups may also provide valuable insights, as they comment and especially rank existing suggestions, thereby indirectly revealing the preference of the crowd. Several implications may be derived from these findings. Aside from the theoretical contribution, we subsequently discuss multiple managerial implications in terms of the actions that public institutions can take to support participants' natural motives and increase the potential platform quality as well as quantity.

Theoretical contribution

The extracted insights add to the recent literature on how public sector crowdsourcing platform providers can engage differently motivated citizens in more dynamic and collaboration-orientated online projects. First, we built upon the already existing knowledge and insights from crowdsourcing research (Franke and Shah 2003; Nambisan and Baron 2007) and initially apply and evaluate those approaches in a public sector setting. Second, we extended the literature discussing citizens' offline political engagement by successfully applying those motives to the online environment (Brady, Verba, and Schlozman 1995; Schlozman, Verba, and Brady 2010). Third, we extended the existing research on citizens' motives for engaging with static eGovernment services (Dimitrova and Chen 2006). While this research primarily addresses the identification and exploration of the motives that

drive citizens to use new services provided by the state, our research effort suggests the reasons why citizens start to actively share, discuss, and evaluate valuable contributions through governmental crowdsourcing initiatives. Fourth, due to the design of the empirical setting – linking perceived behavioral user data (online survey on motives) with the actual behavior of the participants (log file analysis) – we further explore the influence of motives on the actual contribution behavior of participating citizens.

Managerial implications

While developing our research effort, we were able to identify several insights that may contribute to establishing and successfully managing governmental crowdsourcing platforms. These include the following. The *selection of topics* with different levels of complexity appears to be of utmost importance. The governmental institution may provide different sub-topics to address different citizen motives. In the analyzed case of “Aufbruch Bayern”, the participants were encouraged to provide their contributions on the sub-topics of family, education and innovation, which were deliberately related to different groups of interests. Furthermore, asking for explicit solutions to certain problems (expert orientated) as well as allowing general contributions to the topic field (average user) is recommended. The contribution of existing best practices that citizens may have experienced appears to trigger an online dialogue. The applied *platform functionality* should be designed according to the heterogeneous motive structures of the citizen community. The lowest “entrance” enabled visitors to explore the existing content without registering. The evaluation functionalities were defined as the least engaging activity, followed by the ability to write comments beneath already uploaded content or to write messages on personal walls. The upload of ideas and best practices should be considered to be the most challenging type of activity. *Community management* in terms of qualified moderator skills is essential. Aside from welcoming and introducing new citizens in the community, the moderator needs to sense and afterwards indicate the right activities for the individual participant according to their motives. Hence, in addition to community management skills and topic related expertise, the moderator should trigger the online dialogue among registered citizens. To build the right community structure, the *recruiting* and *activation activities* need to be aligned with the desired overall motive structures. Long-term strategies may be developed to increase the participants’ levels of active contributions.

Limitations and Further Research

Naturally, this research effort also has its limits and constraints, calling for future research. First, the study is based on a single case. While the case in question is based on theoretical findings and can

therefore be seen as a current best practice example, the generalizability of the results must be proven through additional studies of similar projects. This case study work was not intended to reflect a representative sample of benchmarking practices of citizen collaboration, but rather as an initial study to observe what is happening and what motives participants bring to the open innovation experience in the entrepreneurial realm. Although this study develops insights, some unanswered questions remain. What is the effect of different motives on citizen's level of contribution? It would be interesting to further explore, for example, the consequences of citizens' participation. Does participation really increase their political skills, reduce their disenchantment with politics or create a better understanding of the current political situation? Such questions may be addressed by future research that investigates how citizens can be openly integrated into governmental processes and activities. At this point, we would like to encourage the research community to expand beyond the limitations of this research effort.

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Annex D

Research Article II

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How Open Government Platform Experience Shapes Citizens Democratic Skills, their Perceived Political Empowerment & Actual Participation Behavior

Abstract

This paper shows that information and communication technologies enable unprecedented opportunities for fostering civic engagement. Complex social challenges may often question the very fabric of modern society and may alienate citizens and create deep-seated tensions between them and their government. Open government platforms promote civic engagement and thereby improve transparency as well as increase legitimacy of governments and their public officials. Drawing on deliberative theories of democracy and experiential learning theory, this research proposes that open government platforms as new affordances facilitate forming democratic citizens. Against this background antecedents of a “valuable online platform experience” and its influence on citizens’ social and political skills, political empowerment, and real participation behavior are analyzed. Data is drawn from an open government platform project under the patronage of the Bavarian prime minister, which has more than 100,000 platform visitors and more than 2,100 active community members during the live phase of eight weeks. The findings show that open government platform experiences may positively contribute to institutions’ ability to form democratic citizens. The implications for the literature and research on deliberative theories of democracy and experiential learning are discussed to dispute the affordances of open government activities and their relevance within democratic systems.

Key Words:

Open Government Platform, Participation Experience, Affordances, Deliberative Democracy, Experiential Learning Theory, Social Problems

Introduction

Social challenges are at the forefront of the agendas of most governments around the world (World Economic Forum 2012). Governments are increasingly forced to aggregate data, information, but also real experiences about such challenges, capture diverse opinions, devise policies, and implement decisions in the best interest of citizens (Mattson 1986). While governments often attempt to construe and attend to complex problems, citizens frequently become alienated and feel their interests are neglected, leading to disappointment, withdrawal, or even unrest (Stall 2010). Neglecting public opinion and citizens' engagement with social problems can even lead to the removal of governments, as the Arab Spring revolutions have shown (Buhl 2011; Khamis and Vaughn 2011).

The concept of collaboration and participation embedded in social media environments can have valuable internal applications in government, as demonstrated in several success stories: (1) the U.S. government initiated several crowdsourcing initiatives, such as www.challenge.gov, (2) the Danish government launched a project on co-creating a new climate strategy with citizens (Climate Consortium Denmark), (3) and the South Korean government launched the e-People initiative, which was designed to support online civil petitions (Nambisan and Nambisan 2013). In contrast to the aforementioned Arab Spring, these and other cases of successful citizen participation did not evolve spontaneously, but were realized in a planned citizen participation process through the affordances of information systems tools. Consequently, these examples show the potential of open government in western democracies, where governments increasingly face the challenge of reaching, activating or even engaging citizens (Stoker 2013).

Recent work has shown that the affordances of information systems, understood as the action potential of what individuals can experience or do by using these systems (Gibson 1979; von Krogh and Haefliger 2010; Markus and Silver 2008), enable governments to access a wide array of information and thereby improve the quality of the political decision making and implementation process (Gray and Lowery 2000). Information systems support large-scale communication, information sharing, online collaboration and content generation, and they coordinate the input from often largely unorganized actors, such as individual citizens (Taweoo Nam 2012).

Deliberative theories of democracy argue that collective decisions are founded not on a simple aggregation of interest, but on arguments made by and to those governed by the decision, or their representatives (Habermas 1996). Hence, these theories focus on an institution's ability to form democratic citizens (de la Porte and Nanz 2004). Since citizens are considered to be in possession of social resources and intellectual capabilities necessary for democratic participation, this formation may be achieved by providing constant opportunities for participation to develop

citizens' social and political capacities (Pateman 1970). Open government platforms (OGPs) - understood as online collaboration platforms where citizen may register, find information and specific task briefs, upload their contributions, and discuss and evaluate existing content - may afford the necessary learning environment for citizens. Platforms may allow citizens to increase their general understanding of and capabilities required to participate in political decision making, with its respective consequences on democracy, the political system, and society (Bucy and Gregson 2001). Moreover, such a learning environment may increase their civic engagement and sense of political influence (Nam 2012). This argument is supported by experiential learning theories, which suggest that knowledge is created through the grasping and transforming of experience (Kolb 1984). Since the development of capabilities may be achieved through use experience and some level of active participation, experimental learning theories help us better understand the affordances of open government activities and their relevance within deliberative democratic systems.

Some politicians have taken action and adjusted their communication behavior to these new conditions by using more participation orientated tools. US President Barack Obama, for example, has made a very clear commitment to changing the way how governments should interact with its citizens in the future and formulated the following three pillars of what he labeled as "Open Government": Governments should be transparent, participatory, and collaborative (Obama 2009). More detailed definitions about open government can be found. Referring to Lathrop & Ruma 2010, Open Government can be defined as the ability to co-innovate with citizen, to share resources that were previously closely guarded and thus harness the power of mass collaboration, as well as drive transparency (Lathrop & Ruma 2010). Moreover, Open Government describes a public administration's capabilities to behave not as an isolated department or jurisdiction, but as a partially open, interactive, and integrated and networked organization (Lathrop & Ruma 2010). Open Government platforms aim at providing a communication and interaction focused online setting, where citizens and the public administration can mutually gather information, evaluate and discuss existing content or focus on the development of (new) ideas, concepts, and best practices (Lee et al. 2012).

The practical relevance of OGPs seems obvious, since many politicians have followed Obama in using social media in a more active and systematic way and not surprisingly; participative online tools like online dialogues, online consultation, and participatory budgeting are enjoying an increasing demand by politicians, administrations, and citizens (Lee et al. 2012). In opposite to the fast growing number of open government projects - (www.participedia.net lists over 400 projects), profound scientific based analyses of this new phenomenon is still rare. Realizing such a transformational change, however, will demand new perspectives on how to connect and engage citizens and government. Our paper addresses this gap by developing a new theoretical framework

capable of explaining both the citizens' OGP platform experience as well as its influence on democratic skills, political empowerment and active contribution behavior of citizens.

Since most existing research has focused primarily on describing the phenomenon of citizen participation (McBeth et al. 2010; Vigoda 2002), our research effort aims to move beyond description, to theorize on what accounts for a valuable OGP experience, and how it may shape citizens' affective relationship with governmental institutions. Such a theoretical framework will not only be useful to governments that decide to open up processes and apply social tools, but also be key in understanding the levers and constraints in using technology to support democratization in societies.

Drawing on data from one of the first Open Government Platforms in Germany 'Aufbruch Bayern' (see a detailed case description in chapter three) the current study contributes to emerging research on open government activities. In so doing the study helps move the theory of deliberative democracy into the domain of information systems, concluding that OGPs may provide a valuable approach to systematically form democratic citizens through active participation. Moreover, the study has several implications for research and practice: First, the paper explores citizens' use experience in the context of OGPs. Second, the author analyzes how citizens' democratic skills (social and political skills), their perceived empowerment and their real participation behavior are influenced by the aforementioned platform use experience. Third, the research article shows affordances of information and communication technologies (ICT) to promote citizen participation, thereby extending the affordance theory as well as the IS literature – e.g. crowdsourcing for innovation (Majchrzak and Malhotra 2013) – to the research field of open government. From a practitioner's point of view (e.g. consultants, public servants, or politicians) this study provides specific recommendations on how to apply ICT in a public sector setting to create a valuable platform experience that in turn contributes to building political and social skills, perceived empowerment and participation behavior.

The paper is structured as follows: As a theoretical introduction, I briefly review the relevant literature on the theory of deliberative democracy, experimental learning theory, and affordance theory and develop our hypotheses. Then the paper outlines the chosen methodology, the empirical setting of our study and a short description of the data collection. Finally, the author present our results; discuss their implications and contribution to theory as well as potential limitations and potential future research.

Literature and Hypotheses

Democratic theory suggests that public value can be better developed when citizens have the chance to directly and actively be involved in policy making (Moore 1995; Habermas 1976; Macpherson 1977). Further, active engagement is considered to contribute to a better identification and articulation of citizens' needs which may result in a more citizen-oriented decision making (Nabatchi 2012). Some researchers even refer in this context to the possibility to enhance accountability, increase perceived closeness to politics, improve trust in government, maintaining legitimacy, and finally building consensus (Yang and Pandey 2011). In democracies, citizen participation was typically understood as indirect participation through voting (Keyssar, 2000). Direct participation, such as town hall meetings, consultation hours, or regular tables with politicians occurred typically only on a local level and until recently, mainly offline (Di Genarro, Dutton, 2006; Lukensmeyer 2002). However, the last decade has brought to light new, more direct modes of participation (von Wright 2006; Di Gennaro, Button 2006; Yang, Pandey 2011). Information and communication technologies are enabling the path into a more interactive, integrative, and politically engaged public by effectively connecting citizens online and facilitating topic related communities (Di Gennaro, Button 2006).

In order to better understand OGP as new affordances for active citizen engagement and participation in the political discussion we need to analyze and classify OGPs within the open government landscape. On a general level OGPs seem to differ based on the direction of the citizen-government relationship. Focusing on rather static one-directional e-government offerings, Dimitrova and Chen (2006) identify crucial factors for online civic engagement in e-government services. They found that the use of e-government services is influenced by demographic characteristics, the civic mindedness, psychological factors and the used information channel (Dimitrova and Chen 2006). Other scholars like Underhill and Ladds (2007) analysed data from the Canadian internet user survey with similar results (Underhill and Ladds 2007).

In the context of public services provision, publications also report drivers of active participation in online services of public institutions (Baum et al. 2003). Scholars recognize that the direct participation of citizens in the delivery of public services can increase the service quality as citizens who actually use a certain service may offer relevant insights on citizens' needs, practicability, and usefulness (Pestoff 2009). In contrast to the research on e-government usage, the development and delivery of public services may have a stronger focus on interactive and collaborative modes during the process of the mutual service development, however still focuses on the rather static service provision, offered by the public institution.

Indeed, with the emergence of ICT, the nature and scope of citizen engagement in societal change and political debate is evolving. These technologies have the potential to redefine relationships

between citizens and their government and among citizens. A central concept in ICT that may shed light on the idea of active citizen engagement is “affordances” (Gibson 1979; Kane et al. 2011; Markus and Silver 2008), which is useful for building better theories on the effects of introducing new systems into the political discussion. From an affordance point of view, technology must be related to the social setting, or as Zammuto et al. (2007, p. 753) suggests, “it makes limited sense to talk about a door handle without discussing the people opening the open doors”. Information systems research defines affordances as “the possibilities for goal-oriented action afforded to specified user groups by technical objects” (Markus and Silver 2008, p. 622). How an online participation platform provides new affordances for active citizen engagement in the political discussion is the focus of our analysis. By treating the symbiotic relationship between the human action and the technological capability as a unit of analysis, the affordance perspective provides a language for beginning to examine ICT and its role in affecting online citizen participation.

Citizens are no longer regarded as passive stakeholders, only having the option of intervening on Election Day, but as active and thus enabled actors with different options for participative democratic involvement (Lips et al. 2009; O’Neill 2009). The interactivity and ubiquitous communications offer co-production on an exceptional scale – participants contribute time, expertise, and effort to achieve a certain outcome, share more responsibilities, and manage more risk in return for more extensive control over decisions (Horne and Shirely 2009). Research has shown that ICT in general affords increased transparency (Brandsen and Pestoff 2006; Carter and Bélanger. 2005; Dimitrova and Chen 2006; Meijer et al. 2012; Raus et al. 2009). The Internet has deeply cut the cost of gathering, distributing, and accessing government information (Roberts 2006). In recent years the research community has witnessed a trend of governments increasing openness in their actions as well as a call for more transparent, participatory and collaborative government.

Representative democracies increasingly face problems of legitimacy as people do not always feel well represented by a minor number of elected officials (Habermas 1973; Macpherson 1977). This problem of legitimacy results from a want of confidence of the represented in transparent and representative processes (Sorensen 1997). A number of deliberative theories democracies exist that shed light on the duty and challenges of a democracy. *Aggregative theories of democracy* have in common that they assume that individuals have certain preferences and interests which change little in the political discourse. Thus, society is regarded as a gathering of atomized individuals and an accumulation of various views and interests. From this view, democratic institutions have to possess the ability to aggregate a plurality of views and interests in order to govern, distribute influence, and regulate conflict.

Integrative theories assume that individuals are able to suppress their own interests and views in the democratic decision-making process in order to promote the common good for society as a whole (Mill 1954). In this sense, society is an “imagined community, more than the sum of pre-given preferences of atomized individuals” (Sorensen 1997, p.555). Integrating individuals in the collective decision-making process and engaging them in processes of democracy, for example, through elections, referenda, direct access and discussions with politicians, and giving them the possibility to publically follow the political discourse are considered as suitable means to form democratic citizens. Already the mere ability to participate may provide a sense of psychological empowerment which leads to a better understanding and holistic view of issues related to democracy (Bucy & Gregson 2001).

In recent years, a rather balanced theoretical reasoning between the two positions of aggregative and integrative theories of democracy has been increasingly discussed in the research community (Porte and Nanz 2004). Although citizens are expected to pursue their interests as active participants, an overall interest in the democratic legitimacy of outcomes ideally characterizes “just” deliberation. Following the argumentation of Habermas, democracy is deliberative when collective decisions are founded not on a simple aggregation of interest, but on arguments from and to those governed by the decision, or their representatives (Habermas 1996). Further, only those regulations or decisions which might claim the agreement of all citizens in a deliberative process are democratically legitimated. This ensures that citizen’s needs, concerns, and constructive suggestions find the way into the policy making process and have afterwards at least the procedural chance to influence on final decision (Carpini et al 2004). Following Eberlein and Kerwer (2002), who argued already ten years ago that deliberative democracy must be considered as the most valuable theoretical framework for analyzing more open methods of political coordination (Eberlein and Kerwer 2002), we also see the latter argumentation very helpful to better understand the latest developments of an increased offer of online participation platforms.

The deliberative theories of democracy focus on an institution’s ability to form democratic citizens. The process of forming democratic citizens refers to the increasing ability of individuals to internalize a holistic perspective on societal governance and to develop their social and intellectual capacities through participation. Thus, Pateman stated already in the early nineties that democratic citizens are considered to be in the possession of social skills and intellectual capabilities, which seem to be necessary for democratic participation (Pateman 1989).

As Habermas (1996) argued, collective decisions are not made through simple aggregation of interests - rather they are based on experience through various arguments provided by and for those ruling the decisions. An analogy to this principle can be uncovered in experiential learning theory, which describes learning as “the process whereby knowledge is created through the

transformation of experience; knowledge results from the combination of grasping and transforming experience” (Kolb 1984, p. 41). Experiential learning theory is built on six propositions: (1) Learning can be described as a process, not only as an outcome. (2) Learning is about relearning, meaning to draw out the learners’ beliefs and ideas on a certain topic, which should be researched, tested, reviewed and integrated with refined and improved ideas. (3) Learning is driven by conflict, differences, and disagreement, allowing movement back and forth between opposing models for reflection and resolution of conflict. (4) Learning involves the person as a whole including thinking, feeling, perceiving, and behaving. (5) Learning includes both the personal and environmental experience and the assimilation of new experiences into existing concepts. (6) Learning is the process of creating and integrating new knowledge.

Assuming that learning is experiential and refined through social interaction and dialogue with others, collaborative activities will allow participants to exercise, solidify, verify, and improve their mental models through discussion and information sharing during the dialogue (Alavi 1994). New skills are acquired and refined through social interaction, dialogue and negotiations with others. Articulation encourages learners to evaluate their understanding, generating reflection and precision of expression (Garrison and Kanuka 2004). Research on individual learning also emphasizes that individuals not only learn from their experience, but also from the experiences of others (Gino et al. 2010).

In general the learning process can be illustrated in a learning cycle including experiencing, reflecting, thinking and acting, and the learner should touch all these bases in a recursive process (Kolb and Kolb 2005). Based on the literature and research cited earlier, the emergence of ICT affords a profound and multifaceted increase in communication and interaction capability. No longer is learning an individual endeavour: ICT can be incorporated into experiential learning to leverage the many-to-many relations among citizens, as well as between citizens and the government, and can create a valuable learning experience. Government institutions, which deliberately connect their citizens, e.g., by establishing OGP platforms as collaborative networks may gain advantages by reducing or even removing geographic distance, organizational boundaries, and time differences as well as enable access to distributed knowledge leading to increased sharing and learning activities (Wasko and Faraj 2000; Zammuto et al. 2007).

These general conjectures received support in prior work on participants’ interest in co-creation projects in commercial settings where individuals build upon other’s contributions to develop a novel integrated policy solution (Majchrzak et al. 2012). ICT must provide an enjoyable and useful experience in order to engage people (Füller et al. 2011; Kohler et al. 2011; Prahalad and Ramaswamy 2003). The affordance of virtual collaboration is highly dependent on the perceived usefulness, the degree to which individuals believe that using the system enhances their

performance (Davis 1989), as well as perceived enjoyment, the degree to which individuals associate using the system with enjoyment rather than increased effort (Dahl & Moreau 2007). The purpose of an affordance is to indicate to the user what the technology can do and how that is done. Thus, open government platforms can be seen as new affordances for citizen engagement. However, there is limited research available on the affordances of interactive and collaborative online platforms in the public sector (Linders 2012; Lindgren and Jansson 2013; Meijer et al. 2012; Mossberger et al. 2013).

Research on the concept of open government has its root in the early work of Wiliam Parks (1957), *George Washington Law Review* 3 (1957-1958), but modern ICT has led to rapid development of research during the past decade (Linders 2012). Hence, arguments in developing a new theoretical framework may often refer to related fields such as open and user innovation research, where sound foundations have already been laid for understanding topics such as engagement and platform experience. Relying on findings from co-creation experience research, the author introduced task enjoyment as well as perceived usefulness as antecedents of participation experience. Further, it was hypothesized the effects platform experience may have on encountered social and political skills, political empowerment, and actual participation behavior on the platform. In developing the framework the author draw on the technology acceptance model, the deliberative democracy theories, and experiential learning theory, and thereby also contribute to that set of theories. The theoretical framework which was developed here is summarized in Figure 1.

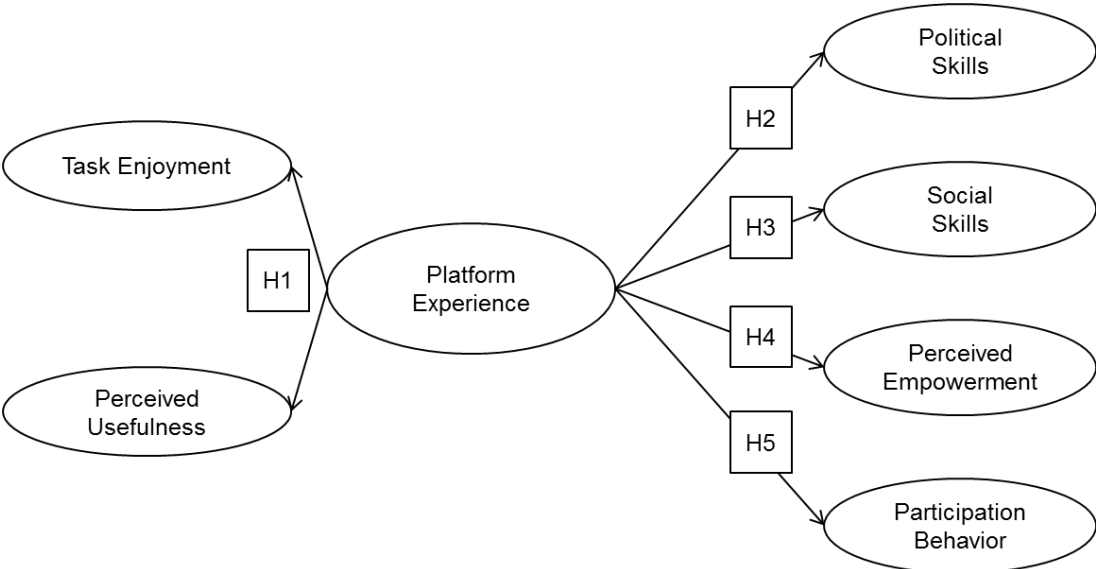


Figure 1: Research Model (source: own description)

Development of Hypotheses:

Platform Experience: Open Government platforms are typically used in socially enriched environments where adoption and use are not only a question of persuasion but rather reflects individuals' desire for connecting with others and/or indulge in contributing to the stated platform tasks (Schau et al. 2003). Starting from an industry perspective, it is clear know that a compelling and enjoyable creative experience is known as a very important factor in evoking participants' interest in crowdsourcing projects and in inciting them indirectly into the generation of valuable input (Füller et al. 2011; Prahalad & Ramaswamy 2003; Nambisan & Nambisan 2008). Dahl and Moreau (2007) showed for instance that individuals engage in creative activities because they look beside others for experiences that provide feelings of task enjoyment as well as utility (Dahl & Moreau 2007). Hence, it was concluded that the actual platform experience seems to be of utmost importance in order to attract participants on a long-term basis and meet certain outcome criteria.

This argumentation relies on the technology acceptance model (TAM) introduced by Davis, which was developed to predict the adoption of technologies (Davis 1985; Davis 1989). The TAM states that the intention to adopt new technologies depends upon the attitude towards using it, which in turn can be interpreted as a function of the perceived usefulness for its users and the perceived task enjoyment. While perceived usefulness denotes the degree to which a person believes that using a particular system would enhance his or her job performance, the task enjoyment refers to the degree to which a person believes that using a particular system would be free of effort. These two perspectives are of utmost importance while considering the need to attract citizen, mobilize and finally offer them a user friendly as well as enjoying platform experience, in order to reach the overall aim of enabling citizen to come up, develop, and discuss political challenges in a more collaborative way.

Task enjoyment helps to further explain why individuals find various tasks inherently interesting. Individuals are likely to enjoy performing creative or even playful tasks as such activities are considered to be intrinsically interesting, challenging, and involving (Csikszentmihalyi 2002). According to Amabile (1993) the creative task itself has to be considered as fun and intrinsically enjoyable in order to come up with creative solutions (Amabile 1996). As people derive high play value from enjoyable experiences, they try to maintain or re-experience such states of pleasure (Mathwick & Rigdon 2004). Intrinsic enjoyment of an activity leads to increased persistence and interest in the activity. It encourages participants to perform at their peak level (Amabile 1996). For instance, individuals engaging in an Open Government platform may derive social value from

the interaction with others or consider the activity itself as enjoying, rewarding, or “just” interesting.

The *perceived usefulness* of certain platforms (including systems, tools, or even tasks) is considered as important factor of the resulting experience (Füller et al. 2011). The Technology Acceptance Model suggests that the intention to adopt new technologies depends on the attitude towards using it, which may be considered as a function of the perceived utility or the perceived ease of use. While perceived utility indicates “the degree to which a person believes that using a particular system would enhance his or her performance”, perceived ease of use refers to “the degree to which a person believes that using a particular system would be free of effort” (Davis 1989). Following Füller et al. (2011) people in general enjoy cognitive tasks and get pleasure from online activities (Hoffman & Novak 2009).

As the engagement in open government platforms is completely voluntary, we assume similar underlying interests. Citizen may look for enjoyable experiences and take part in virtual consultation or dialog processes, because they consider it to be an intrinsically rewarding as well as easy and useful to conduct activity (Carpini et al. 2004). Given the high degree of interrelationship between task enjoyment, and utility, it was assumed that the valuable experience underlies these two experience facets as a common second-order factor (Kim & Stoel 2004). Hence it could be proposed:

H1: A valuable experience is determined through the factors that provide a feeling of perceived task enjoyment and usefulness.

Outcome Variables:

Political Skills, defined as a broader knowledge in political relationships, deeper understanding of political topics, processes and institutions, and the resulting critical and self-reflective estimation of one’s political skills are considered as very important attributes, which should be learned, understood and in the best case used accordingly (Galston 2001). The construct “political skills” is considered to help citizens to understand their interests as individuals and as members of certain groups in society or the whole society and finally plead for once one argument and positions (Carpini & Keeter 1997). Moreover, a better knowledge on relevant topics will provide the self-confidence required for publicly taking up a stance on debated topics and will lead to a better understanding of potential outcomes of different public policies and its boundary conditions. On a more general level, it could even be said that political skills provide the basis for a general trust in the political system and for support of core democratic principles (Galston 2001). Since Open Government platforms are understood as an interactive, collaborative and transparent place, where

participants find a stage for discussing and exchanging political ideas, arguments as well as concepts, and participate in a dynamic learning process, the following hypotheses was formulated:

H2: A valuable experience has a positive impact on the political skills of the participants.

Social Skills: Social competencies provide an essential foundation for life-long learners who are able to love and work (Beland, 2003; Cohen, 2001; Zins, Weissberg, Wang & Walberg, 2004). In this context social skills are understood as basic enabler, which provide individuals the chance to accomplish social interaction (Kanter et al. 2005). Social skills cover the broad range from existing social norms, cultural aspects, to learned as well as trained behaviour (Sorensen 1997). A well-developed set of social skills allows citizen to interact in groups adequately, take social responsibilities and may even consider the general public interest as more important as the personal interest (Wang & Walberg, 2004). Also Cohen (2006) introduced a list of social skills and dispositions especially required for participation in a democracy: Cohen identified the ability to listen to ourselves and others as well as to be critical and reflective as the first two dimensions of social skills. Furthermore he introduced the ability to be a flexible problem-solvers and decision makers, including the ability to resolve conflict in creative, nonviolent ways. As another requirement he mentioned communicative abilities, e.g., being able to participate in discussions and argue thoughtfully and collaborative capacities understood as learning to compromise and work together toward a common goal.

Consequently, in a more interactive and integrative political environment, social skills are considered as basic enablers, which allow individuals to participate, interact, discuss as well as evaluate on an appropriate level within a public environment. Since it can be assumed that social skills may be further facilitated and enhanced by an active online participation it could be stated:

H3: A valuable experience has a positive impact on the social skills of the participants.

Political Empowerment: The general concept of empowerment has been applied in various domains and research contexts such as *management studies*, where employee empowerment is reached through an increased control and self-efficacy (Conger 1989; A. Rapp et al. 2006; Thomas & Velthouse 1990); the *information system research*, where employee empowerment is realized in the context of process reengineering (Seidmann & Sundararajan 1997) and *consumer research*, where companies reach a certain degree of empowerment (consumer empowerment) through providing an increased access to information and greater choice (Wright et al. 2006; Henry & Caldwell 2006; Davies & Elliott 2006). In the context of political studies the construct of empowerment is operationalized through citizen participation (Sorensen 1997; Sorensen 2002; Bucy & Gregson 2001).

Whereas the past discussion was mostly focused on real life participation and thus concerned with a rather passive or at least indirect participation mode, new research discussion consider more

active and thus direct participation modes, supported by Social Media, and the respective networks (Bucy & Gregson 2001). Research in computer sciences has shown that the Internet enables individuals to engage in activities that allow them to learn and practice skills in a nonthreatening environment, which means that the psychological cost of failure is much lower than in offline environments (Amichai-Hamburger et al. 2008; Füller et al. 2009). As Sorensen puts it, “in a predominantly integrative theory of democracy, empowerment means transforming individuals into citizens; that is, increasing the ability of each individual to internalize a holistic perspective on societal governance and to develop their political as and social/intellectual capacities” (Sorensen 1997, p.557). Since the experience on such an OGP may serve as a new mode which enables the postulated “procedure which contributes to the production of democratic citizen” (Sorensen 1997, p.557) by an interactive offering of participative tools, it can be stated:

H5: A valuable experience has a positive impact on the perceived political empowerment of the participants.

Real Behavior: This measurement is operationalized as a quantitative measure, including the actual number of comments, pin wall messages, evaluation, and number of uploaded contributions (ideas; concepts; best practices). As already introduced above, enjoyable as well as useful activities result in a perceived added value (Deci & Ryan 2002). Participants who are enjoying the platform experience are considering their activities as rewarding instead of effort. Consequently, actors are willing to invest more resources (time, creativity etc.) in their platform behavior (Simonton 1999). This feeling may even result in the desire to sustain or soonest repeat the task and will thus automatically lead to a higher number of platform contributions (Belk et al. 2000). Since it was hypothesized that a valuable platform experience consists of enjoyment and utility, it can be expected that a high valuable platform experience will result in an increased number of contributions and thus state:

H5: A valuable experience has a positive impact on the real behavior, operationalized as the number of uploaded contributions.

Research Design

Research Setting

The online dialog “Aufbruch Bayern” can be described as an online platform, where citizens can articulate, evaluate and discuss ideas, suggestions as well as concepts. An online dialog typically pursues the following objective: (1) generation of a heterogeneous and qualitative idea pool, (2) development of exciting input for discussion, (3) sophisticated evaluation of the content and (4) a general realization of a transparent dialog. The Bavarian State Government announced the online

participation platform in July 2010. In between eight weeks Bavarian citizens were called to suggest their ideas, concepts and best practice cases related to three main policy areas: Family, education and innovation. The overall aim was to actively integrate Bavarian citizens into the policy development process, to increase awareness towards these policy areas, and to establish a closer relation between the governmental institution and the citizens. In total, the platform had about 2,100 active participants and more than 100,000 visitors. 740 ideas were created during the two months and about 10,000 evaluations were counted while over 6,000 messages were written. Consider figure 2 for further graphical aspects of the landing page.



Figure 2: Online Dialogue Homepage "Aufbruch Bayern"

Data Sources and Data Collection

A multi-method approach (Creswell 2003; Tashakkori & Teddlie 1998; Tashakkori & Teddlie 2003) – including a qualitative as well as quantitative data – was applied to gain a deeper understanding. The strength of mixed method research lies in its holistic way of viewing and answering research questions. Hence, mixed method research helps to offset the disadvantages that certain methods have by themselves, thereby enabling to avoid common method bias, and yields the possibility for falsification (i.e. divergent findings) as well as stronger inferences (Podsakoff & Organ 1986).

The Method & Measurement:

The authors had access to a large set of data collected via the publicly accessible platform. Data such as log files (visits, amount and form of activity per user), user data (usernames, user ID, sent and received messages on profiles) and information on designs (graphics, number of received comments, number and average of received evaluations) were exported from the platform system

data base (MySQL). This data includes structured, semi-structured and unstructured data. It provides the major source for our single case study research. It was complemented with a post-project online survey. The online survey was launched after the online participation initiative in order to test the developed hypotheses and get more information on demographics. For all measurements, existing scales from the literature were applied and slightly amended to the context. The online survey was conducted in the German language. English scales or items were translated by bilingual experts and subsequently re-translated to control for language and translation specific differences. The perceived task enjoyment was measured on the basis of Nysveen et al. (2005). Perceived usefulness was measured according to the scales proposed by Davis et al. (1989). The measurement of social skills was grounded in the suggested items of Ohanian (1990) and the construct of political skills was operationalized by Fox et al. (2009). Finally, we used Sweeney et al. (1999) items to measure political empowerment. All items were measured with a 5-point Likert scale, anchored with “strongly agree” and “strongly disagree”. The formulation of all items for social and political skills and empowerment started with “The participation at ‘Aufbruch Bayern’...” in order to clearly measure the effect the participation had on skills and empowerment and not vice versa. For detailed information compare Figure 2.

Construct	Item	Mean	SD	Factor loading	Factor reliability	Average variance extracted	Fornell-Larcker Ratio
Task Enjoyment	The participation at ‘Aufbruch Bayern’ (AB) pleased me.	2,12	0,98	.93			
	The participation at ‘AB’ enjoyed me.	4,19	1,01	.75	.85	.65	1,05
	The participation at ‘AB’ was interesting for me.	1,91	0,88	.72			
Perceived Usefulness	The participation at ‘AB’ allowed me to bring in my suggestions.	1,97	1,02	.85			
	The participation at ‘AB’ made the discussion easier.	2,49	1,05	.71	.71	.46	1,51
	The participation at ‘AB’ was of little use for me.	3,83	1,22	.71			
Platform Experience (as second order factor)	Task Enjoyment	2,74	0,94	.88	.87	.77	.44
	Perceived Usefulness	2,76	1,10	.89			
Social Capabilities	The participation at ‘AB’ showed me that all citizens should be heard.	2,10	1,08	.78	.65	.48	.54
	The participation at ‘AB’ showed me that the general public interest is more important than the single interest.	2,32	1,08	.59			
Political Capabilities	The participation at ‘AB’ provided me with a good summary of relevant political topics.	2,89	1,02	.79			
	The participation at ‘AB’ allowed me to deal with new political arguments.	2,79	1,12	.71			
	The participation at ‘AB’ gave me the possibility to deal with different political positions.	2,22	0,92	.84	.88	.56	.82
	The participation at ‘AB’ enabled me to better analyse political questions.	3,16	1,08	.82			
	The participation at ‘AB’ enabled me to better analyse conflicting aims in political context.	3,25	1,09	.74			
Political Empowerment	Due to my participation at ‘AB’ I got a sense of participation at the political decision-making process.	2,76	1,16	.84			
	Due to my participation at ‘AB’ I believe that politicians take my suggestions serious.	3,32	1,23	.94	.95	.83	.32
	Due to my participation at ‘AB’ I got the feeling of being a real part of the decision-making process.	3,40	1,23	.94			
	Due to my participation at ‘AB’ I believe that my political opinion is better noticed.	3,17	1,23	.92			
Participation Behavior	Number of ideas	1,79	14,05	.82			
	Number of comments	5,39	31,98	.57	.88	.65	.10
	Number of pin wall messages	5,09	84,75	.96			
	Number of evaluations	13,88	64,93	.59			

Table 1: Summary of applied Measures (Source: own description)

After an online pre-test with 25 participants, data collection with the final questionnaire was collected over a period of two weeks in October 2010. 2,094 emails with a link to the online questionnaire were sent and 437 complete questionnaires were returned. This corresponds to a response rate of 21 %. Respondents received no incentives for answering the survey furthermore, the questionnaire was provided in German. In order to control for possible nonresponse effects as

described by Armstrong and Overton, the author compared first, early as well as very late respondents, but no significant differences were found (Armstrong & Overton 1977). Therefore, non-response bias does not seem to be a problem in this study.

Within the survey sample, 60.8 % of the respondents are male, 39.2 % are female. Moreover, 7% can be described as immigrants in contrast to about 80% German participants. On average, 21% of the participants of the survey had a secondary school qualification and almost 70% a high school diploma. Over 75% (Mean = 4.2; SD = 1.7) of the participants indicated that they go regularly to the polls. Finally, the majority of the survey participants can be described as loyal voters (Mean = 3.0; SD = 1.8) and as experienced in political issues (Mean = 1.7; SD = 0.9).

Next, the author duplicated the survey with a randomly chosen control group of 9,500 citizens in Bavaria, who had not participated in the “Aufbruch Bayern” OGP project. Here we achieved 204 valid responses (2% response rate). Due to the fact that the survey was sent online, all respondents of both the treatment and control groups can be considered to be 'online' in the sense of being able to use email and to handle web pages.

Finally, log-file data was used to analyze the real behavior of registered participants on the platform and compare the latter with the survey data. Our log-file data consists of all possible user and content related activities on the OGP. This includes for instance the uploading of ideas, comments, or messages, as well as evaluation, with related information such as time, user ID and content ID. The log-file data enabled us to reconstruct the community growth with all relevant community activities. Over the period of eight weeks participants spent 760 working days on the platform, which sums up to more than 364,800 minutes of residence time on the platform.

Analysis & Findings

To test our hypotheses a structural equation model in AMOS 7.0 was set up. The parameter estimation was computed with Maximum-Likelihood estimation. The global fit measures indicate an adequate overall fit of the model (CMIN/DF 22.285/125), and also the local fit measures for the constructs meet all required standards which are currently reported in the literature (GFI; AGFI > 0.9; TLI, CFI, IFI > 0.95; RMSEA < 0.08), for instance by Browne & Cudeck (1993) and Hu & Bentler (1999). As reported in Table 2, all indicators got good factor loadings and the respective factor reliabilities exceed the required reliability in structural equation modeling of 0.6. In addition, the average variance extracted of the constructs can be seen as fulfilled (Bagozzi & Yi 1988).

Second-order structure of participation experience

To test participation experience as a second-order factor of task enjoyment and perceived usefulness, two models of our conceptual framework were compared. One model consisted of first-order factors for perceived enjoyment and usefulness and the other model consisted of participation experience, as a second-order factor underlying perceived enjoyment and usefulness. Table 2 depicts the overall fit indices for the first- and second-order model. Following Burnhan and Anderson (2004), AIC₀, BCC₀, and BIC₀ were used to compare the not nested models and to evaluate the second-order structure. The analysis provides strong evidence for the second-order structure as the difference measures AIC₀, BCC₀, and BIC₀ are all > 10. Furthermore, paths from the second-order factor to the first-order factors satisfy the requirements with ($\beta=0.79^{***}$) for enjoyment and ($\beta=0.91^{***}$) for utility. Based on this result, it was concluded that valuable platform experience as a second-order factor represents platform enjoyment (63% of variance) and platform usefulness (83% of variance).

Model	χ^2/df	GFI	AGFI	CFI	RMSEA	AIC ₀	BIC ₀	BCC ₀
First-order factor model	2.059	.926	.904	.964	.050			
Second-order factor model Experience	1.968	.922	.898	.9967	.048	16.129	16.240	21.167

AIC₀ = AIC_{m1} - AIC_{m2}; BIC₀ = BIC_{m1} - BIC_{m2}; BCC₀ = BCC_{m1} - BCC_{m2}

Table 1 Model Comparison (source: own illustration)

Main Effects

The results displayed in Figure 3 provide support for all hypothesized main effects. Valuable experience has a positive effect on political skills ($\beta=.67^{***}$), H1; on social skills ($\beta=.58^{***}$), H2; on perceived empowerment ($\beta=.52^{***}$), H3; as well as on participation behavior ($\beta=.13^*$), H4.

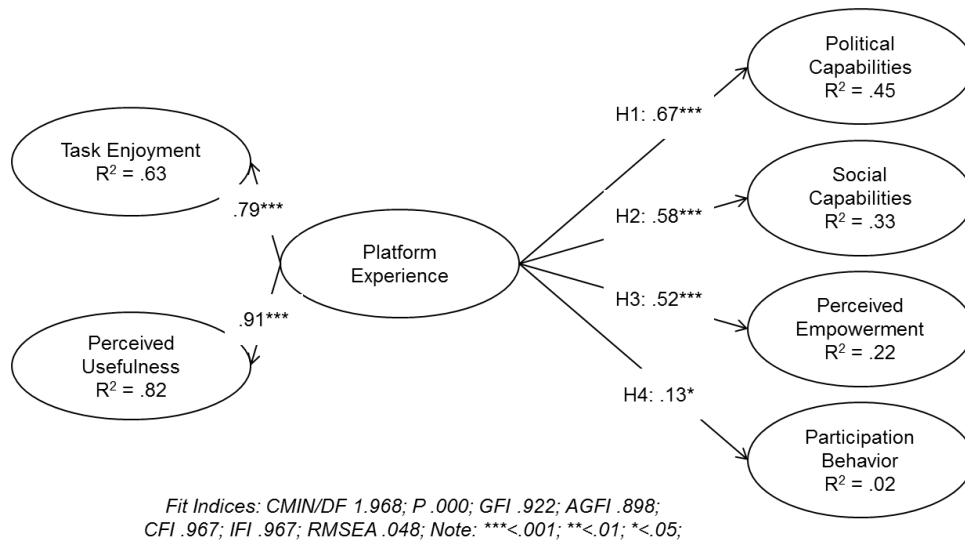


Figure 2: Model (source: own illustration)

Multi-group analysis was conducted to test the moderating effect of “Community Interest” on the relationship between participation experience and political as well as social skills, between participation experience and perceive empowerment, and between participation experience and real behavior. Two models were compared – one imposing equality constraints on all dimensions across the subgroups and a general model allowing all of the parameters to vary freely across the subgroups. As these are nested models with the general model having one degree of freedom less than the restricted model, the χ^2 value will always be lower for the general model than for the restricted model. If χ^2 improves significantly when moving from the restricted to the more general model, the dimension has a differential effect on the overall model and can be seen as a moderator. The chi-square difference test for community interest ($\chi^2 = 11.467$; $p = .043$) provides significant chi-square difference effects, suggesting the null hypothesis can be rejected and in indeed has some moderating effect. Interest in the community significantly affects the impact of participation experience on actual behavior ($\chi^2 = 4.142^*$) as well as the impact of participation experience on political skills ($\chi^2 = 4.457^*$). All other effects are non-significant. Table 3.

	Low	High	Chi-square difference (Δ DF = 1)
Experience → Political Skills	= .537 (t=5.171)***	= .739 (t=7.089)***	$\chi^2 = 4.457^*$
Experience → Social Skills	= .511 (t=5.439)***	= .626 (t=5.511)***	$\chi^2 = .033$
Experience → Empowerment	= .450 (t=5.026)***	= .567 (t=6.165)***	$\chi^2 = .543$
Experience → Contr. Behavior	= .011 (t=.204)	= .251 (t=3.073)**	$\chi^2 = 4.142^*$

χ^2 for all parameters set equal across subgroups (Δ DF = 5): 11.467* (.043)

* p < .05; ** p < .01; *** p < .001

Table 3 Moderating Effect of Community Interest on Relationship Outcomes of Co-creation
(source: own illustration)

Discussion and Implication

The initial validation for the vision of citizen engagement in identifying, discovering and solving societal challenges can be seen through the increasing demand by politicians, administrations, and citizens to open government platforms (Lee et al. 2012). To help better understand virtual civic engagement and the sense of political influence, this paper has provided a theoretical framework addressing the antecedents of a valuable Open Government online platform experience and its influence on citizens' social and political skills, their perceived political empowerment, and the actual participation behavior on the platform – which are all relevant for citizens in an intact democratic society. To elaborate further on the antecedents of an OGP experience, our framework moves beyond describing the phenomenon of citizen participation (McBeth et al. 2010; Vigoda 2002).

The contributions of our research effort are as follows: First, we provide a theoretical framework to operationalize the valuable OGP experience as a second order factor construct on the one hand, and on the other hand, we measure the influence of a valuable OGP experience on political and social skills as well as perceived empowerment and actual platform behavior. Second, we provide first insights into OGPs as new affordances contributing to institutions' ability to form democratic citizens. We thereby refer to deliberative theories of democracy as our theoretical foundation, the experimental learning theory, which help us to better understand the participation orientated learning potential of OGPs and finally the information system affordance theory as well as the technology acceptance model, to better grasp the role as well as the most effective design of OGPs and their interaction with all relevant Stakeholders. Our findings show that OGPs allow or even trigger learning and thereby support citizens to build social as well as political skills. Indeed, they contribute to citizens' perceived political empowerment and ensure different types of contributions (e.g. ideas, best practices, comments, evaluations etc.) allowing politicians to generate insights and derive, for instance, insights for the agenda setting, or the evaluation and optimization of their policies.

Online participation platforms as a new affordance for active citizen engagement in the political discussion contribute to a better political understanding once citizens perceive their participation as valuable experience. Further, we found that valuable participation experience contributes to building citizens' political and social skills and therefore helps them get a better understanding of democratic principles. Our findings are consistent with previous research proofing that these skills contribute to developing democratic citizens, who are better able to state, argue, and scrutinize

heterogeneous interests and justify their positions in view of the common good of a given constitution (Nanz and Steffek 2004).

Our theoretical framework is grounded in deliberate theories of democracy emphasizing the improvement of citizens' social and political skills through collaborative discussion and participation (Habermas 1996; Pateman 1970). Based on experiential learning theory (Kolb 1984), we conjectured that new skills are acquired and refined through experiencing dialogue and interaction, reflecting on other thoughts, reviewing and improving ideas. Our framework and findings suggest that online participation experience not only supports the building of democratic skills but also aids citizens in feeling empowered and consequently becoming active contributors to the political debate. These findings demonstrate the importance and the potential impact that such platforms can offer to society. However, they also show that OGPs have to provide an enjoyable and useful platform experience in order to create positive outcomes. In line with research from open innovation related user participation platforms, we found also evidences that a valuable platform experience in the public sector should consist of both, a perceived usefulness as well as an enjoyable task. Especially the latter dimension (enjoyable task) seems to be not yet sufficiently integrated into existing OGPs (Dahl and Moreau 2007; Füller et al. 2011; Kohler et al. 2011; Prahalad and Ramaswamy 2003). Hence, the challenge is to build proper affordances, which provide enjoyment but also enable useful contribution at the same time. In our case, both components are strongly linked to forming valuable experience as a common underlying second order factor. This finding provides important insights for the affordance design of political participation platforms. An enjoyable experience is important even in the political context, which is known for its factual and prosaic topics, as well as in the context of customer co-creation projects as already shown in several studies (Füller et al. 2011; Kohler et al. 2011; Prahalad and Ramaswamy 2003). To conclude, while previous theories of democracy argue that collaborative decisions are not simply built on aggregation of interest (Habermas 1996), OGPs help us to reflect on the ability to aggregate a plurality of views and interests and integrate citizens in the collective decision-making process.

Furthermore, we found a rather stable effect of a positive OGP participation experience on social and political skills of citizens, their perceived political empowerment, and their actual participation behavior, highlighting the relevance of OGPs for a wide range of populations. Due to the virtual setting, the given possibility of anonymity, and the much focused setting, Open Government platforms seem to also serve as a fruitful enabling and learning environment for more general soft skill abilities, by simultaneously serving as a creative and knowledgeable source of new ideas, best practices, comments, and possibilities of evaluation. Referring to the above introduced integrative theories, Open Government platforms may be understood as modern and innovative instrument to enable individuals to suppress their own interests and views in the

democratic decision-making process in order to promote the common good for society as a whole (Mill 1954).

This large-scale empirical research effort shows that online participation activities contribute to perceived citizen empowerment; that could be understood as citizens' perceived influence on the political decision making process. These findings are in line with findings from the open innovation research field. Firat and Venkatesh (1995) found that virtual simulation creates the possibility of re-empowering consumers. Whereas the influence of a valuable platform experience on social and political skills addresses general intellectual as well as social skills of the society, the analyzed impact of a valuable platform experience on the perceived empowerment of individuals targets more the direct and current relationship between citizen and its political institution. Open Government platforms help citizens to come up with their own ideas and suggestions and even more important, this online participation provides a direct and interactive channel of collaborative working between two formally separated systems. In this sense, virtual participation serves as a "technology of self" (Füller et al. 2009). Furthermore and confirm with our hypothesis, we found that a valuable platform experience has a significant impact on the real behavior, measured by the number of contributions. Participants who are enjoying the platform experience seem to consider their activities as rewarding instead of effort. Consequently, actors are willing to invest more resources (time, creativity etc.) in their platform behavior (Simonton 1999). This result is of high value since this particular measurement is not a "perceived" construct but measured as a real empirical behavior. Moreover, this insight shows that a valuable platform experience has a direct impact on the output of an Open Government Platform and may therefore serve as a solid success factor, at least from a managerial perspective.

From a practitioners point of view this study will put forward implications for political actors, which can be used to further develop the already pursued directions of providing more collaborative, transparent and interactive tools and thereby optimize the rather fragile relationship between the state, the society, and the individual. Moreover, and probably most important, the results and deduced insights show that OGP may serve as a very valuable tool to educate citizens, engage them in policy development and thereby trigger their active participation behavior. This seems of high relevance not only for politicians but also for experts working in the public administration and public sector consultants.

While this study provides first insights into OGPs as new affordances contributing to institutions' ability to form democratic citizens, the current research has limitations that raise the need for more academic work on the topic. First, the study is based on a single case. Since the case in question offers findings in support of a framework rooted in existing theories of experiential learning and democracy, it can be seen as a current "good practice" example. However,

establishing the generalizability of the theoretical framework will requires testing across other projects. To increase our understanding of how government can systematically create a vibrant platform to foster civic engagement and social problem solving and provide an enjoyable and useful experience, further research is needed that explores the role that individual citizens and their content play in such experiences. A qualitative analysis via a netnographic approach of the verbal discourse among citizens and between citizens and the government may help provide a better understanding of the processes, perceptions, and feelings of the citizens participating in the online dialogue. Moreover, future research should apply our theoretical framework to investigate more specifically the platforms' ability to engage immigrants in the political process and build their social and political skills.

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Annex E

Research Article III

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Identifying Participants' Roles in Open Government Platforms and its Impact on Community Growth

Abstract

Public institutions increasingly rely on Internet-based Open Government Platform through which citizens can interact and contribute to the policy development process. To successfully set up, activate, and manage these communities, organizations need to understand what roles members assume, how they communicate and vary in their contribution behavior. Consequently, this paper is concerned with the theoretical deduction and network based analysis of user roles in a public sector online participation project. In this exploratory study we investigate the heterogeneity of community participants, by analyzing user typical roles, their development over time and possible influences on the overall community building process. By using social network analysis, we find different user roles to differ in kind and quality of their contributions in creating, shaping, and disseminating Open Government activities. Our paper contributes to a better theoretical understanding of distinctive user types in Open Government Communities, their role in the community and their contribution to the overall platform success. From a managerial perspective, the study provides guidance for contest platform design and appropriate reward structures.

Key Words

Crowdsourcing, Citizen Engagement, Online Participation, Online Community, Participant Roles, Social Network Analysis, Contribution Behavior

Introduction

Open Government offerings benefit from a more collaborative policy development process by effectively channeling citizens' experience and knowledge (Mergel & Bretschneider, 2013). Many politicians have followed Obama in using interactive means to communicate with the public. Participative online platforms such as online idea competitions, online dialogues, and online consultations are enjoying an increasing demand by politicians, administrations, and citizens alike (Lee, Hwang, & Choi, 2012). The growing number of open government projects, (www.participedia.net lists already over 400 projects) indicates the increasing relevance of Open Government Platforms (OGP) in public sector settings.

OGPs increasing popularity raise questions of adequate planning, developing, managing, and evaluating pertinent for manager in public sector institutions. One focal aspect for all OGPs consists in identifying an effective community structure. The desired platform is dependent on a sharp target group definition, an appropriate recruiting and implementation strategy. While we do have a sound understanding of users' engagement and their different roles in open-source software or open-content communities (Sawhney, Verona, & Prandelli, 2005), little is known about citizens' roles and their contributions in OGP communities.

This paper therefore is concerned with the theoretical deduction and network based analysis of user roles in an OGP. In this exploratory study we investigate the heterogeneity of community participants, by deducing typical roles, their development over time and possible influences on the overall community building process. The more comprehensive understanding of the underlying network structure will contribute to a better understanding of Open Government activities, which will have the potential to anchor, strengthen, and further develop already existing democracies (Howard, 2010). In contrast to the private sector, which has already recognized the importance of including the public in the formerly closed processes of innovation and new product development (Mortara & Minshall, 2011), the public sector has just started to integrate citizens in a more systematic way (Lee, Hwang, & Choi, 2011).

To stay competitive, public administrations have to increase the ways and means of co-operation with its citizens (Feller, Finnegan, & Nilsson, 2011). Today's ICT-driven approach to Open Government takes this development into account by elevating citizens to a participatory and deliberative role (Heckmann, 2011). Barack Obama showed that modern channels of online participation may be used to reach citizens by aiming at more transparent, interactive, collaborative processes of policy development (Obama, 2009). Hence, the ability to better understand different roles of platform members

and their possible contributions has become critical for organizations in order to better integrate citizens in a participatory democracy process (Hautz, Hutter, Fuller, Matzler, & Rieger, 2010a; Nolker & Zhou, 2005).

Existing research on open innovation and crowdsourcing highlights the importance of a clear understanding of the underlying community network structure and the user roles for the success of such online participation projects (Hinds & Lee, 2008). User roles have been shown to differ according to the community's purpose (Hinds & Lee, 2008; Nolker & Zhou, 2005), which increases the relevance of this research effort since it will focus for the first time on the OGP community. The study's aim is to examine participants' roles in Open Government platforms and the impact of community growth, including output quantity and quality. Hence our research questions are as follows: What are the key user roles in an open government community? How do those roles influence the community growth over time?

Therefore, this quantitative exploratory case study investigates the heterogeneity of participants on OGPs. The scientific relevance of this research effort is motivated by the transformation and enrichment of already existing knowledge from the research of crowdsourcing into the research of public administration as well as growing open government research. From a managerial perspective, the study provides guidance for the design of appropriate rewards and encouragement of different user roles to enable governmental institutions to conduct Open Government platforms successfully. Moreover, since Open Government platforms can also be misused by radical groups, egoistic individuals, or interest groups, we believe that our insights will provide relevant insights on how to identify corrupt behavior on participatory online platforms.

Theoretical Background

Network Theory and the construct of online communities

The network theory provides additional insights on how to understand the function of communities (Granovetter, 1973; Scott, 2009). Social networks are defined by a certain amount of people, groups, or even organisations (nodes) which are interconnected (Scott, 2009). Network nodes vary in their definition and may be defined as individuals, groups, or organisations and institutions. The question of which and how many other nodes are accessible via directly connected links is another defining part of a network node and is referred to as the degree of centrality (Newman, 2003). Network ties may be presented as categories of friendship, business relations, or reputation and can be measured by

their weights, representing a measurement how close those relationships are (Erdős & Rényi, 1961). Another characterization of network ties refers to their directedness. Network ties are mainly undirected, meaning that they run in both directions and thus establish a very important measurement of networks known as reciprocity (Faust & Wasserman, 1992; Scott, 2009). Further measurable aspects of networks are different community structures or patterns within larger networks (Faust & Wasserman, 1992; Scott, 2009). In this context online communities may be defined as aggregations of like-minded people with similar interests who virtually “meet” on the Internet to exchange experiences, discuss certain points of view, or create common visions (Ilkka, 2002). Shared consciousness, rituals and traditions, as well as a sense of moral responsibility weld groups of individuals together and are the main connections of a community (Muniz Jr & O’guinn, 2001), (Cova & Cova, 2002).

Community Formation and their Members

In literature, a number of approaches are discussed to better understand communities’ formation which give further insight into various member roles and the importance of content (Kim, 2000; Williams & Cothrel, 2000). Williams and Cothrel (Williams & Cothrel, 2000) conclude that three kinds of activities are critical for a community’s continued viability: 1) member development as critical mass is required, 2) asset management, and 3) community relations, as interaction with other people is considered the main reason for participation. The number of people needed to make an online community viable and to attract others is known as its critical mass (Markus, 1987) and explains part of the community’s success or failure. Similarly, Butler et al. (Butler, Sproull, Kiesler, Kraut, & Weisband, 2008) infer that not only technical management but also social management, is required. To maintain a community, social encouragement may be necessary (Butler et al., 2008), (Füller, Bartl, Ernst, & Muhlbacher, 2004). Previous research has shown that members with different roles can be encountered in communities and that these different roles are essential for viable communities. Based on interests and relationships, Kozinets (R. V. Kozinets, 1999b) found four user roles in virtual communities of consumption: Tourists don’t have strong social ties to the group and are characterized by superficial interests in consumptive activity. Minglers keep up strong social ties, but are only superficially interested in consumptive activities. So-called devotees maintain a strong interest in consumptive activity but have few social attachments to the group. Insiders are those with strong social ties and strong personal ties to the consumption activities (Kim, 2000; Nolker & Zhou, 2005; M. A. Smith et al., 2009). Relationship-based roles, e.g., gatekeeper follow the traditional network node structures of hub, broker, and bridge (Denning, 2004). Behavioral roles are defined on the basis of an individual behavioral pattern such as debater, motivator, or spammer (Viégas & Smith, 2004). Nolker and Zhou

(Nolker & Zhou, 2005) identify leaders, motivators, and chatters as the three key member roles in an online knowledge sharing community.

Online Innovation and Brand Communities

‘Online innovation communities’ are understood as a different kind of experienced users who contribute, discuss develop ideas, concepts, and inspirations for new product development (Schröder & Hölzle, 2010; Von Krogh & Von Hippel, 2006). Referring to Hutter et al. (Hutter, Hautz, Füller, Mueller, & Matzler, 2011a) this particular research subject can be theoretically founded from different perspectives such as open-source projects (David & Shapiro, 2008; Lakhani & Wolf, n.d.; Nov, 2007; Oreg & Nov, 2008; Schroer & Hertel, 2009) virtual communities of practice (Ardichvili, Page, & Wentling, 2003; Ardichvili, 2008; Daugherty, Lee, Gangadharbatla, Kim, & Outhavong, 2005; Sharratt & Usoro, 2003), and user innovation communities and virtual consumer integration (Franke & Shah, 2003; Füller, 2006; Hemetsberger, 2002). Hemetsberger and Reinhardt (Hemetsberger & Reinhardt, 2006) note that most communities in the open source software context show such characteristics: members feel very close to the group; feel responsible for other members; and share common rituals and traditions.

In marketing, the emerging phenomenon of consumption and brand communities has led to a vivid body of research investigating these new forms of community. Smith et al. (D. Smith, Menon, & Sivakumar, 2005) show that consumers perceive peer recommendations as more trustworthy than sponsored ads. Hence, firms are increasingly relying on user based tester and promotional campaigns to leverage the power of “word of mouth” and therefore increase the sales statistics. The transformation of this theoretical perspective into the public perspective offers numerous interesting starting points. The basic perception that Open Government activities may not only be understood as integrating citizens into the problem solving and idea generating process, but to an even greater degree, involve them in the communication as well as the “selling” process of political decisions. Since public administration activities are largely understood as policy implementation tasks, the sales and market perspective is of great importance. The new demands from different stakeholders such as citizens, politicians, interest groups and the media might be addressed by integrating citizens into the process of policy implementation (Cross, Laseter, Parker, & Velasquez, 2006; O’Toole, 1997; Toral, Martínez-Torres, & Barrero, 2010).

Online Community Members: Existing Types and Roles

As shown above, a clear understanding of the roles within a community is required for successfully managing the social network. Therefore, research on key members, user types, and distinctive roles in a wide variety of online communities exists (Cross et al., 2006; Hautz, Hutter, Fuller, Matzler, & Rieger, 2010b; Hutter, Hautz, Füller, Mueller, & Matzler, 2011b; Kim, 2000; R. V. Kozinets, 1999a; Nolker & Zhou, 2005; Nonnecke & Preece, 2000; Toral et al., 2010; Ye & Kishida, 2003). Hautz et al. (2010) has conducted an extensive review on user types in private sector online communities which form the basis for their research on company related online innovation communities. The results of the review are summarized in Table 1 and lay the foundation for the present study. The fact that some basic user types can be found in such fundamentally different community contexts, such as open source software projects and commercial crowdsourcing ventures, lead to the expectation that similar user types may apply to Open Government communities in the public sector as well. However, once again the applicability of findings from the private sector to Open Government communities cannot simply be assumed due to the aforementioned influence of the community purpose on user roles (Nolker & Zhou 2005; Hinds & Lee 2008).

Study	Context	User Types								
<i>Social patterns and behavior</i>										
Kim (2000)	online communities	visitor	novice	regular	leader	elder				
Kozinets (1999)	virtual community of consumption	tourist	mingler	devotee	insider					
<i>Contribution frequency</i>										
Füller et al (2007)	online consumer community	lurker	poster	frequent poster						
Koch and Schneider (2002)	open source software community			active programmer						
<i>Contribution frequency and behavior</i>										
Nonnecke and Preece (2000)	open source software community	lurker	discussant	developers						
Ye and Kishida (2003)	open source software community	passive user	bug reader	bug reporter	bug fixer	peripheral developer	active developer	core member	project leader	
Viegas and Smith (2004)	online conversation newsgroup community	pollinator	debater	bursty contributor	newcomer	question asker				
<i>Social interaction (Social network measures)</i>										
Toral et al (2010)	open source software community	peripheral user	brokers	regular contributors						
Cross et al (2006)	virtual community of practice	peripheral user	brokers	central connectors						
Nolker and Zhou (2005)	online knowledge sharing community		chatter	motivator	leader					
Hautz et al (2010)	online innovation community	passive user	idea generator	motivator	attention attractor	motivator, attention-grabbing	motivator, idea generating	attention attractor, idea generating	attention attractor, motivating, idea generating	
Hutter, Hautz, et al (2011)	online idea and design contests	observer	competitor	co-operator	communititor					

Table 1: Community Types and Roles (source: Hautz et al., 2010b)

Research Design

Research Setting

The research questions are answered by means of an explorative case analysis (Eisenhardt, 1989; Glaser & Strauss, 1967) of the Open Government platform Aufbruch Bayern (<http://www.archiv.aufbruch-bayern.de>). During a period of 8 weeks in the months of July and August 2010, the platform offered citizens the possibility to discuss ideas, recommendations, and best practice cases. A total of 2,094 users registered on the platform and the community generated 740 ideas, 10,932 evaluations and a total of 6,342 contributions to the discussion. In sum, the members spent 760 working days on the Aufbruch Bayern platform and the community platform attracted 400,000 visitors.

Data Sources and Data Collection

The log file is a database containing attributes on all registered users as well as their visits, to and actions and behavior on the community platform (Nicholas, Huntington, Lievesley, & Withey, 1999). Of particular interest for the present analysis was the user ID, the amount of submitted ideas on a per-user basis, and the information on exchanged comments.

Methodology

The data generated through the interaction was analyzed by social network analysis (SNA). Researchers have studied networks by analyzing social patterns (Kim, 2000; R. V. Kozinets, 1999b) or users' contribution frequency (Füller, Jawecki, & Mühlbacher, 2007), often in combination with their prior behavior (Viégas & Smith, 2004). SNA provides a huge advantage as complex social phenomena such as groups of interacting individuals, community structures, and the importance of users and their contributions (Borgatti, Mehra, Brass, & Labianca, 2009) are no longer limited to the investigation through qualitative tools but can be explored quantitatively (Nolker & Zhou, 2005). The SNA approach is based on the representation of a community as a social network connected by direct member-to-member relationships (Hautz et al., 2010a; Nolker & Zhou, 2005). Such a network consists of nodes and ties connecting the single nodes. As a relationship or tie between two users in the Aufbruch Bayern community has been established by a user commenting on another user's idea, all the ties in the network are directed. The direction of the relationship between two community members indicates the sender and the receiver of a specific comment (Hanneman & Riddle, 2005). A relationship between two users is established as soon as a single comment is exchanged. No answer from the receiver of the comment is necessary to forge a tie between the two nodes. Not to require reciprocity for the

establishment of social relationships like previous researchers (Kossinets & Watts, 2006) preserves unidirectional ties which are of fundamental importance in identifying key members and distinguishing user roles (Hautz et al., 2010a).

Measures of Contribution Behavior

Out-Degree Centrality is defined as the amount of a node's outgoing relationships (Freeman, 1979). The out-degree measures the number of comments each user has written on the ideas of other community members. Generally speaking, the out-degree represents a user's possibility of reaching and influencing others (Borgatti, Everett, & Freeman, 2002). In the case of an Open Government platform however, the measure indicates the user's participation and engagement level within the community.

In-Degree Centrality captures the number of comments received by each member of the network (Freeman, 1979) and indicates a user's popularity and prestige within the network (Hanneman & Riddle, 2005). In the case of the analyzed Open Government platform, comments are sent to ideas and not directly submitted to other users. In this sense, in-degree centrality indicates the attraction a network member can generate with his or her submitted ideas.

Number of Ideas by each user, captures the user's direct contribution and their uploaded ideas. Such a purely quantitative approach at assessing users' value at innovation and idea generation is justifiable as the connection between idea quantity and creativity and innovation success has been confirmed (Osborn, 1953). The number of ideas submitted by the single users could be extracted from the server's log files (Nicholas et al., 1999) and was included in the network for further analysis through an attributes dataset, assigning the respective idea count to every node (Borgatti et al., 2009; Hanneman & Riddle, 2005).

Findings

Descriptive Analysis

All isolates – users without any ties in the form of sent or received comments – have been removed from the network (Hanneman & Riddle, 2005). Self-reflexive ties, namely users' comments on their own ideas, have been disregarded (Hanneman & Riddle, 2005). The graph has been formatted using the UCINET NetDraw tool (Borgatti et al., 2002). The network consists of a total of 627 nodes and 1,673 directed ties. Due to the application of a weak notion of social relationship, a connection between two users is established as soon as a single comment has been sent. Reciprocity, or a minimum

number of exchanged messages, is not required (Granovetter, 1973). The tie strength is indicated in the graph by the thickness of the line connecting two nodes. The thicker a tie, the more comments have been exchanged among the respective users. To complete the picture, the node size in the graph reflects the number of ideas submitted by each user. Essentially, the Aufbruch Bayern community consists of a relatively small but tightly interlinked core (red) surrounded by a large number of pendants (blue).

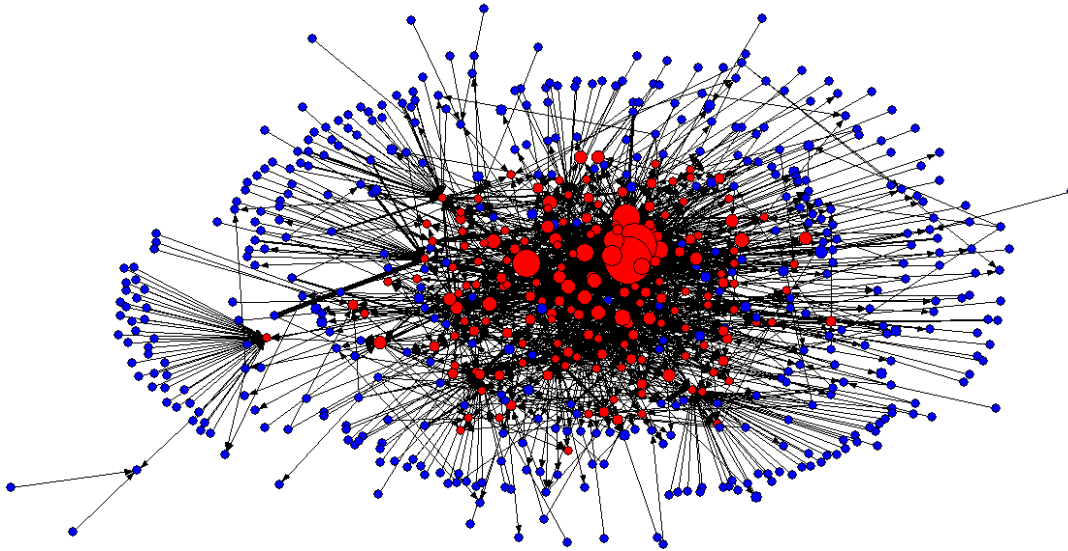


Figure 1: Core Members of the Aufbruch Bayern Network

In accordance with the graphical representation of the network, users with an in-degree of four or higher have been defined as core members. This grouping is supported by the highly significant differences among core members and peripheral users: T-Tests regarding in-degree, out-degree (Borgatti et al., 2002) attest core members a noticeably higher amount of comments sent and received as well as a larger number of submitted ideas. As interdependencies regarding the network observations exist, especially concerning in- and out-degree centrality, the special approach of the UCINET network software, based on permutation tests, is necessary to ensure the reliability of results (Hanneman & Riddle, 2005).

The pendants are usually connected to the network by a single tie of low strength. In general, the pendants are the origin of those ties and they are directly connected to a node that is part of the network's inner core. The statistical analysis attests the peripheral users a mean out-degree of 1.77 as well as an average in-degree of 1.66. However, the median out-degree of 1 compared to the median in-degree of 0 indicates that the majority of the pendants have sent, but not received a comment. These findings add up with the information derived from the size of the nodes: Pendants' nodes are small, already

indicating that they have submitted an average of just 0.56 ideas with a median of 0. Since comments have been posted in reference to an idea, and are only indirectly connected to the author of the respective idea, pendants are not on the receiving end of network ties. While the pendants of the network form a rather homogeneous group, according to the relatively low standard deviation and variance of all three measurements, the core members seem to be more diverse. This is most obvious for the node size indicating the number of submitted ideas.

	core members	pendants
<i>out-degree</i>		
Mean	11.02	1.77
Median	0	1
Std. Deviation	42.18	4.12
Variance	1778.78	16.93
Skewness	8.51	9.80
Minimum	0	0
Maximum	481	64
<i>in-degree</i>		
Mean	11.29	1.66
Median	9	0
Std. Deviation	17.41	4.01
Variance	303.26	16.08
Skewness	3.76	1.41
Minimum	0	0
Maximum	133	30
<i>nr. of ideas</i>		
Mean	2.48	0.56
Median	1	0
Std. Deviation	4.90	1.10
Variance	23.96	1.22
Skewness	5.75	1.79
Minimum	0	0
Maximum	43	13

Table 2: Descriptive Statistics of Core Members and Pendants

While the nodes are significantly larger in the core compared to the network’s periphery, with an average number of nearly 2.5 submitted ideas, there exists some variance in node size. In addition, the core members have a higher number of in- and outgoing connections, and the ties are generally thicker. The “average user” of the Aufbruch Bayern platform has sent, as well as received more than four comments and published a single idea.

	out-degree	in-degree	nr. of ideas
Mean	4.43	4.43	1.11
Median	1.00	1.00	1.00
Std. Deviation	23.26	10.85	2.92
Variance	541.08	117.68	8.52
Skewness	15.27	5.91	9.45
Minimum	0	0	0
Maximum	481	133	43

Table 3: Descriptive Statistics of the "Average User"

The median of one on all three measurements indicates that a large proportion of the users were at least casually involved in the community activities making use of all of the platform’s features. Nonetheless, the relatively high skewness of the three measures points to heterogeneous user behavior regarding the reviewed criteria.

User Typology

The “average user” is not representative for the members of the Aufbruch Bayern community. These findings are in line with previous research which supports the need to identify the key members of a network and assign appropriate user roles in order to be able to successfully manage an online community (Hutter et al., 2011a).

In this particular case, a user was considered a key member if he was responsible for no less than one percent of the overall contribution in at least one of the three categories. This approach led to the identification of 34 key members which have further been analyzed and categorized according to their behavioral attributes. Table 3 provides an overview of the identified user roles and their behavioral attributes.

	out-degree	in-degree	nr. of ideas
Speaker	high	low	low
Attention Receiver	low	high	low
Contributor	low	low	high
Socializer	high	high	low
Political Animal	high	high	high
Spectator	low	low	low

Table 4: User Roles in the Aufbruch Bayern Community

The adjoining table provides a more concrete picture of users' behavioral attributes as well as a test of significance:

Variable	Speaker		Attention Receiver		Contributor		Socializer		Political Animal		Spectator		F-Value (p)
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
out-dgree	56.25	24.57	3.9	5.00	10.25	10.90	44.00	15.10	127.22	142.01	1.63	3.03	120.31***
in-degree	9.88	6.47	38.00	8.21	16.25	7.37	40.33	3.21	66.22	33.18	2.59	4.40	304.23***
nr. of ideas	1.75	1.28	1.60	0.70	8.75	2.87	3.33	2.08	19.22	13.07	0.76	1.04	198.55***

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Table 5: Behavioral attributes of the different User Types

As the ANOVA results show, the key members differ significantly according to their communicative activities and use of the features of the Open Government platform. Significant differences also exist when compared to non-key members of the community. As interdependencies regarding the network observations exist, especially concerning in- and out-degree centrality, the special approach of the network software based on permutation tests is necessary to ensure the reliability of results (Haneman & Riddle, 2005). Figure 2 shows the deduced findings on the network graph (Borgatti et al., 2002). Not surprisingly, the identified key members are part of the inner core of the network, or fulfill the role of hubs (Denning, 2004), connecting a large number of pendants to the network.

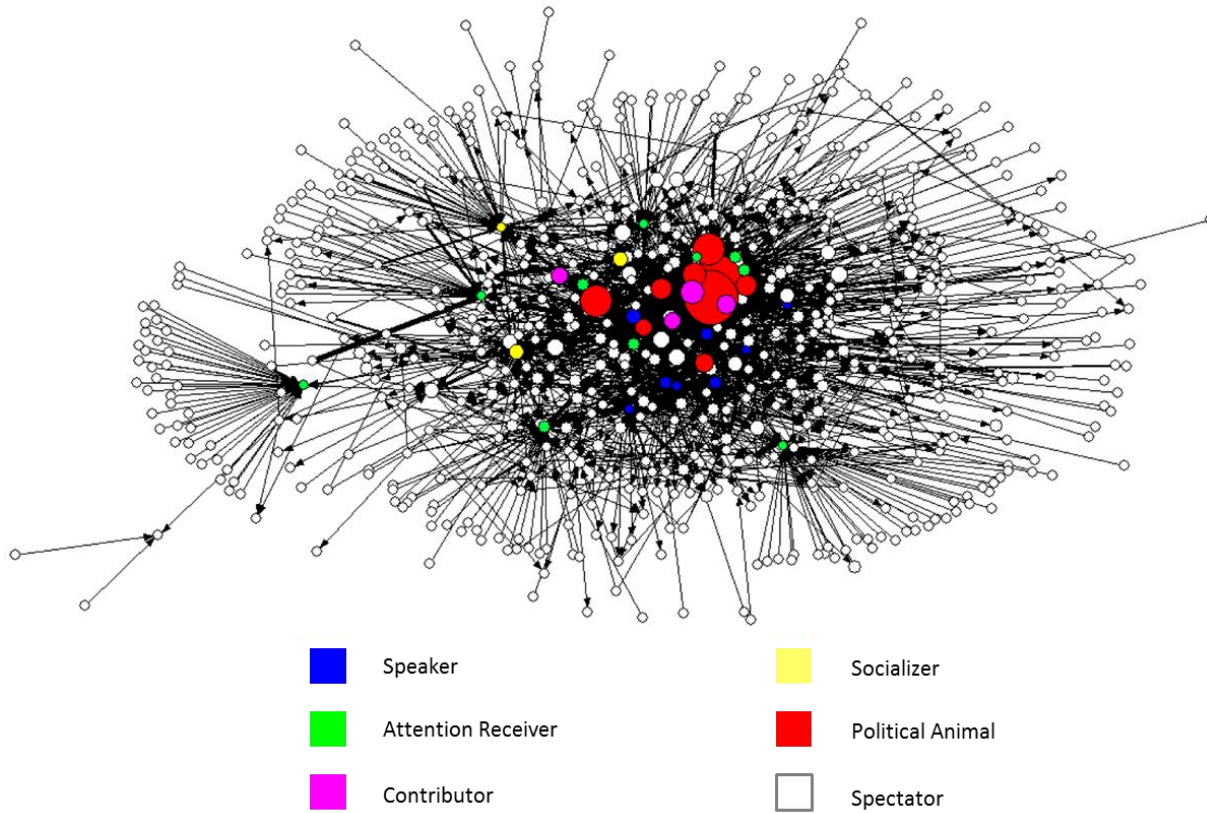


Figure 2: User Roles in the Aufbruch Bayern Community

In the following paragraphs, the six identified user Roles are analyzed in detail on the micro level of individual users. To gain insights on the behavior of, and differences between the user roles, the ego-centric network of a representative of each category is examined.

Speaker: The first identified user type is the speaker. The role of the speaker is rather common among community key members, making up for 1.28% of the overall network population. Speakers are characterized by a high out-degree, or number of comments sent. Simultaneously, they have submitted just a small number of ideas, or even no ideas at all, generating low interest among the community as indicated by the low in-degree (amount of received comments).

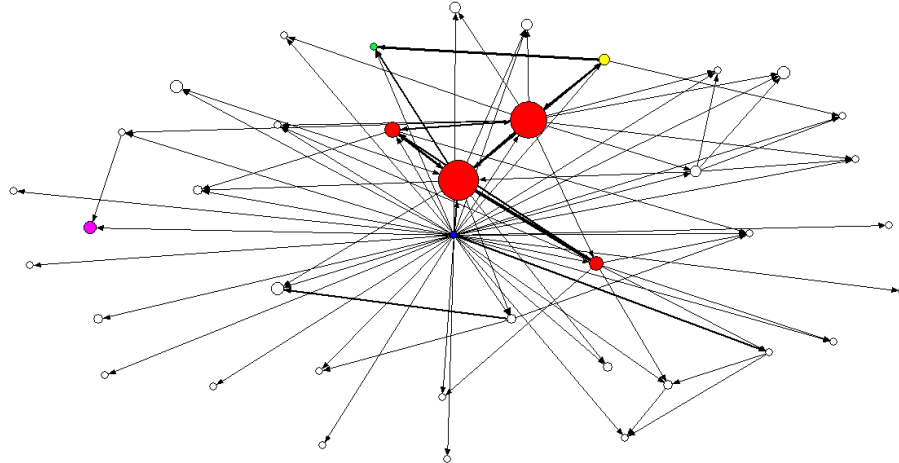


Figure 3: Speaker (ID 36)

Figure 3 depicts the egocentric network of user 36 marked in blue. A classic example for a speaker with did not submit any ideas and received nor comments. Nonetheless, the egocentric network is rather big due to the high number of comments sent by user 36.

Attention Receiver: The egocentric network of an attention receiver is quite the opposite from the previously analyzed graph. Instead of having a high out-degree due to a large number of comments sent, the attention receiver is characterized by a high in-degree (amount of received comments and rather low number of submitted ideas) (see Figure 4).

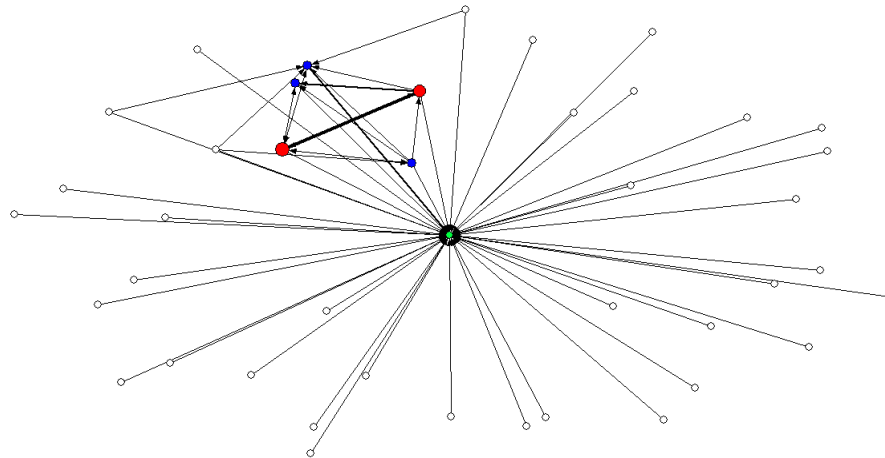


Figure 4: Attention Receiver (ID 799)

The category of attention receivers mirrors the role of efficient contributors. Measured by incoming comments (with a low number of submitted ideas) attention receivers are able to efficiently attract the community's attention. They form the largest group within the key members but still represent only 1.59% of all the users. Even though they do not submit many ideas, the once they provide are of high

interest according to the proxy measure (e.g. they are able to elicit a high level of attention in the form of comments, evaluation and personal messages from other members).

Contributor: The contributor is a classic user role identified in a number of private sector studies concerned with online innovation (Hautz et al., 2010a). Characterized by a high number of submitted ideas and a low amount of comments exchanged indicated by a low out- and in-degree, the importance of those contributors arises from the fact that a high number of ideas increases the probability of successful innovation (Osborn, 1953). The network is not very dense and the number of nodes is especially low (see Figure 5).

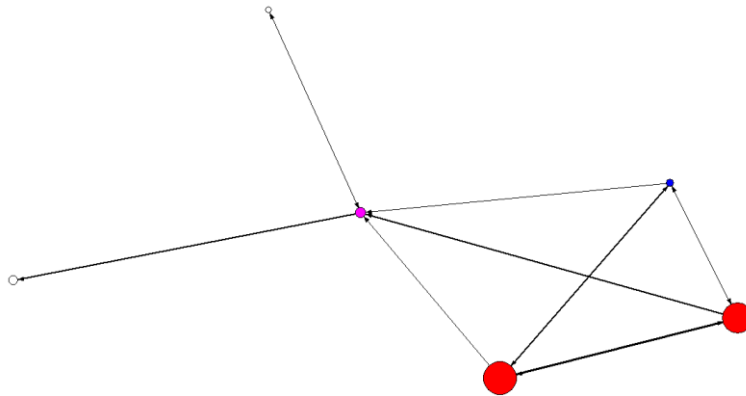


Figure 5: Contributor (ID 1787)

Socializer: With a mere 0.48% of the network population, the socializers make up the smallest group identified in the community. Figure 6 depicts the egocentric network of user 502, represented by the yellow node at the center of the network. With a high amount of exchanged comments represented by simultaneously high out- and in-degree, and a low number of submitted ideas, socializers combine the behavioral attributes of socializer and attention receiver. In this sense, socializers are very valuable for the operator as well as the community itself. They provide ideas of high quality according to the attention they attract in the form of incoming comments. Simultaneously, they help keep the community alive by interacting with other members and by partially fulfilling the role of hubs (Denning, 2004), connecting pendants to the network.

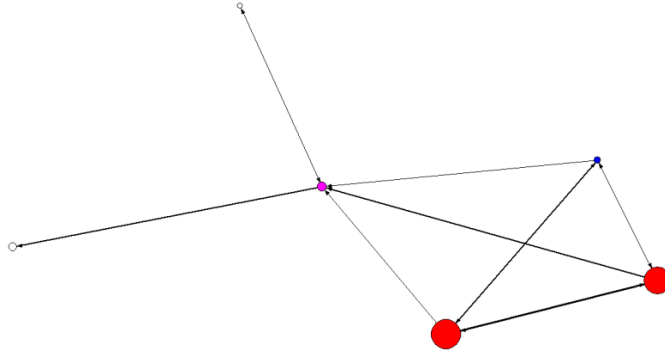


Figure 6: Socializer (ID 502)

Compared to the previous graphs, the egocentric network is characterized by a relatively high number of reciprocal relationships indicated by ties with arrows on both ends. Therefore, it stands to argue that socializers manage to attract a high level of attention for their ideas, and not just for the quality of the ideas, but by eliciting answering comments by commenting on the ideas of others.

Political Animal: The political animal ranks high on all three measured criteria. This becomes clear from the sheer size and density of the egocentric network.

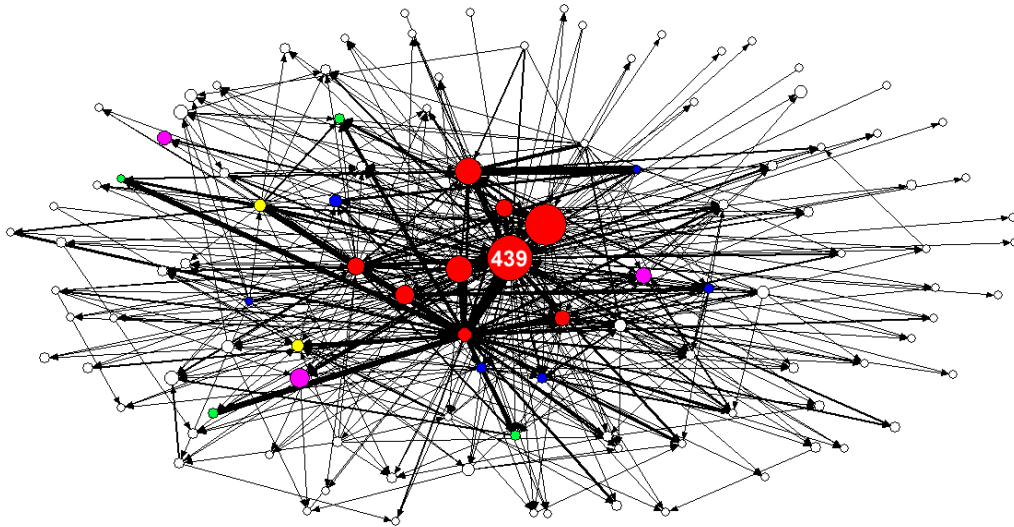


Figure 7: Political Animal (ID 439)

While the density of the egocentric network points to the political animals' high in- and out-degree, the large size of the red nodes marking political animals indicates the high number of ideas submitted by this user type. The research on the Aufbruch Bayern platform highlights the importance and value of political animals, even though they only make up for a very small part of the total community. However, with 1.44% of the network population, they represent a large part of the key members, second only to the attention receivers. They rank higher on every measure than the respective specialist:

The political animals' mean out-degree is higher than the speakers'; their mean in-degree ranks above the attention receivers'; and they outperform contributors with respect to the number of submitted ideas.

Spectator: Even though spectators are not the key members of the network, they form a distinctive user type as well. A spectator has been defined as performing low on the three measured attributes: out-degree, in-degree, and number of submitted ideas. The idea of a rather inactive type of user is very common in network studies and previous researchers have identified similar concepts such as peripheral users (Cross et al., 2006; Toral et al., 2010), lurkers (Füller et al., 2007) or tourists (R. V. Kozinets, 1999b).

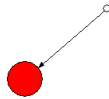


Figure 8: Spectator (ID 1422), out-degree 1, in-degree 0, 0 ideas

User 1422, represented by the white node, is a pendant who is directly connected to the core of the network by having posted a single comment on another user's idea. Combined with the sheer size of this user group, the contribution of this particular user type as a whole is substantial. Taken together, all spectators have sent 968 comments (34.88% of all exchanged messages) and attracted 1,534 comments (55.28%) with a total of 449 submitted ideas (64.42%).

Community Growth

With the aid of social-network-analysis, networks can be analyzed over the course of time. Starting with a number of 174 members who joined the community within the first week of inception, this number peaked to 407 members during the sixth and seventh weeks. Pointing from this generic development of the community to the specific network structure within this eight-week-timeframe, the complexity of relationships within the network grows concurrently. Within the development of the network structure it is noticeable that the core of the community is already build in the beginning of time. Around this core, community members from peripheral areas are connected towards the overall network. The majority of members tapping into different roles are located within the inner core of the network. Political animals and socializers provide the basis for the development; it is interesting those attention receivers generally and the majority of speakers predominantly join the community over time. Starting with a single speaker within the first week, the number grows to three identified speakers until the fourth week. In addition, the total number of members joining the community increased from a 22% growth rate in week five to a 33% growth in the sixth week. The same phenomenon ap-

plies to attention receivers. Comparing this to the previous analysis of the community index, where the number of members peaked (at the very end of the contest in-between the sixth to seventh week) it is conceivable that attention receivers are the efficient community members because they are able to attract the community's attention. Accordingly, socializers are identified to be of high value for the community because as they join the community, they develop a lot of connections towards other, already existing and especially new members.

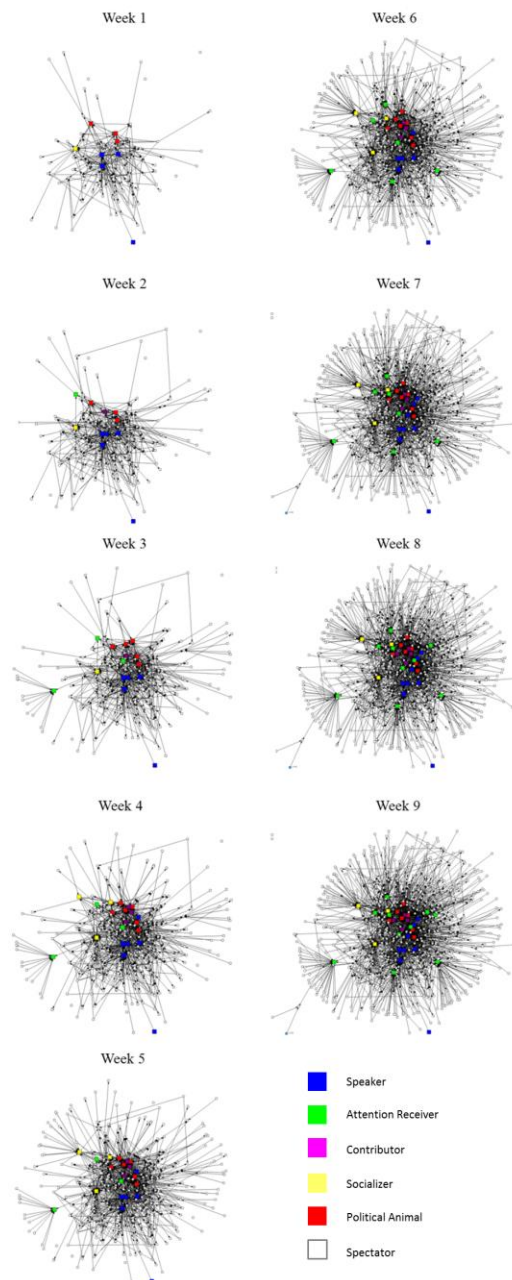


Figure 9: Network Growth

Discussion and Implication

In this article, we studied key user roles and the evolution of a community in a political context. Throughout our analysis we recognized the fact that an Open Government community has a different purpose than other social online or innovation communities and therefore requires different kinds of user participation and interaction. Considering the Open Government community as a social network, connected by member-member or member-contribution relationships, we were able to take advantage of the strengths of SNA which provided new insights into the members' roles (Nolker & Zhou, 2005).

One central contribution of this research effort is the classification of the network population into six user roles, namely speakers, attention receivers, contributors, socializers, political animals, and spectators. These identified user roles differ significantly in their communication and commenting activities, as well as their contribution to the platform's main purpose in the form of submitted ideas. Another central finding is that Open Government platforms have to be seen as an "eco-system" of user roles which evolves over time and where success depends on the right mix of the different roles.

The implications of the present study are manifold. Firstly, it is clear that the users of Open Government platforms are of very heterogeneous nature and cannot be managed efficiently and effectively on the basis of the "average user". Next, the user roles identified in the Aufbruch Bayern community are comparable to findings from research on private sector communities of all kinds, especially online innovation contest communities (Hautz et al., 2010a). In general, the combined analysis of submitted ideas and the users' commenting activity revealed that the amount of contributed ideas alone is not sufficient to identify the most valuable members of a community. In order for the platform to become more than just a place for citizens to present their ideas to the government, the communication and interaction among members has to be recognized and encouraged as well. Only then can Open Government platforms evolve while benefiting from the interaction among users.

User roles perspective: contributors have been identified to be important for the community since a high amount of ideas increases the probability of discovering an appropriate solution (Osborn, 1953). Furthermore, the existence of a certain number of ideas has implications on the overall platform success since already uploaded ideas are used for inspiration. From the operator's point of view socializers and attention receivers have low interest in the community's main purpose, the generation of new and valuable ideas. Through the high number of votes and ingoing comments these members receive valuable feedback and suggestions from other members which yield the potential for further development of the posted idea. The crowd evaluation allows verification about how much attention a new idea will receive among individuals and how their preferences can be identified. They mobilize others

to contribute ideas by providing valuable knowledge transferred through active feedback and suggestions leading to an overall higher quality of ideas, and even more important, to a more positive social platform experience for all community members.

Speakers are a combination of socializers and attention receivers. They submit high quality ideas measured by the number of attracted comments and simultaneously support others by giving feedback and sharing their knowledge. Political animals go one step further. They provide a high number of ideas, and aim for the greater good by helping and supporting others in refining their ideas as well. Such behavior has been proven to be of great value in the private sector (Hutter et al., 2011a), and is arguably even more important in the public sector. Finally, the spectators: While often disregarded in other studies (Nolker & Zhou, 2005) spectators must be considered valuable as well. As mentioned earlier, inactive users have been identified by researchers. Moreover, they normally make up for a very large percentage of the overall population. In case of the Aufbruch Bayern platform, nearly 95% of the community members have been characterized as passive. The large number of spectators fulfills the additional role of reaching the critical mass necessary for a community to take off and become popular. Furthermore, the number of community members is clearly visible on the Aufbruch Bayern website, motivating more active users through the knowledge of being able to reach a broad mass with their ideas and comments.

Content related perspective: In order to add more content-related arguments to this discussion, we linked our quantitative findings to the content and compared it qualitatively with a private sector idea campaign. In a typical crowdsourcing venture, comments had an average length of 33 words and were already described as “very detailed” (Hutter et al., 2011a). In case of the Aufbruch Bayern community however, the average length of comments is with approximately 95 words, nearly three times higher, supporting the purpose of in-depth discussions and lengthy arguments in a political context. Contributors send a very low number of comments, and these comments are relatively short, having an average length of roughly 53 words. The political animals on the other hand are the only group that could clearly and positively distinguish itself from the other user roles both regarding the quantity as well as the length of the comments. With an average of approximately 123 words per comment, they have once again proven their high value for online innovation communities in general and Open Government platforms specifically. While speakers and socializers sent a high amount of comments, the length of these comments is unexpectedly low. Therefore, in a political context these two user roles seem to be more similar to the private sector concepts of chatters (Nolker & Zhou, 2005) or motivators. They are using the platform for socializing, gossiping, chatting, building relationships and gaining friendship with other community members instead of actively contributing to in-depth political

discussions. The role of providing others with suggestions and detailed feedback seems to be taken up by the attention receivers. While the social network analysis of the Aufbruch Bayern community indicates a similar behavior in the public sector, the length of comments draws a different picture. Attention receivers do participate in in-depth discussions through comments, with an average length of nearly 86 words, but they do so only sporadically. Therefore, it stands to argue that in political contexts participants of this type should not be seen as egoistic and competitive, but as experts in certain fields.

Community evolution and growth perspective: Our findings show that the core of the community networks is already developed at the very beginning of the Open Government campaign and members from peripheral areas are connected towards the overall network. These insights have major implications on the selection of initial content to inspire and motivate the community members during the first weeks. Furthermore, this implicates that the recruiting efforts should be very specific and targeted at the beginning of such an Open Government campaign. Viral processes, generated by the possibilities of sharing the campaign, contributing ideas, comments, and messages into the social networks, may be considered as the fundamental enabler of this phenomenon. One conclusion we have drawn is the importance of recruiting active community member in the beginning of an Open Government platform. This may include attention receivers, contributors, and of course the very important group of political animals. Later, the group of socializers seems to be of great value to increase the interconnectedness of the single community members while simultaneously optimizing the community experience in a positive way.

The findings of the present study do not just enrich literature and theoretical understanding of Open Government platforms, but provide direct practical implications as well. Online communities play an ever increasing role not only in the private sector, but in the public one as well. To realize the vast potential of online communities, the appropriate design and management of the underlying network is essential. All user roles are of some value and have to be considered from the designing phase of the platform throughout the whole life cycle of the community. Hence, our research offers implications for appropriate incentives structures, rewards, and the encouragement for users who are actively contributing to support the needs and health of the community. Our findings indicate that, contributors may be more interested and engaged in creating ideas and designs while socializers may be more attracted by and engaged in the community itself, and the community functions that the platform offers. To support this valuable behavior, additional incentives could be offered not only for the best ideas but also for the most active and the most supportive behavior. In addition, recognition or small gifts

may be appropriate for the most active socializers. Needless to say, it is important to align the offered incentives with the desired behaviors in order to avoid crowding-out effects and free-riding.

Socializers enable the community to become more than an online website where users can simply submit their ideas. Their engagement nurtures a lively community where likeminded citizens interact and collaborate online through the use of social software applications. These findings offer important practical implications for the technical design of Open Government Platform communities. Only the inclusion of special community functions enables socializers to engage in communication and interaction, which allow information and knowledge sharing and enhance organizational learning. This results in collaborative, more successful, and creative innovation.

Naturally, this research effort has its limitations, calling for future research in this research area. First, the study is based on a single case, the Bavarian Aufbruch Bayern project. While the case in question is based on theoretical findings and can therefore be seen as a current best practice example, the generalizability of the results have to be proven through additional studies of similar Open Government projects. Next, the results have been derived through a purely quantitative approach based on social network analysis. While the advantages of SNA are numerous, a qualitative analysis of the content of ideas and comments could reveal additional insights, especially on the quality of the contributions. A qualitative analysis of the user-generated content is required to confirm the findings.

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Annex F

Research Article IV

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Beyond Participation: Design Principles for Citizen Co-Creation Systems

Abstract

In this paper we study a novel form of citizen eParticipation, defined as citizen co-creation, in which citizens collaborate to develop an integrated novel policy solution. Online citizen co-creation moves beyond utilizing ICT to achieve deliberation and greater participation in the policy making process. It makes use of web 2.0 technologies in order to formulate policy solutions through integrating diverse knowledge. Surprisingly, eParticipation literature has paid little attention to the design of online co-creation systems, which are instrumental for affording collaborative co-creation. In this article we empirically conceptualize the socio-technical design of online co-creation systems through which citizens co-create novel policy solutions with a particular focus on policy formulation with knowledgeable citizens who hold domain-specific knowledge in a particular policy area. We conducted a 22-month design science research project in which we designed, implemented and evaluated an online citizen co-creation system for collaborative policy formulation. The study results in a design framework subsuming 9 design principles for designing citizen co-creation systems that afford collaborative co-creation and derive 9 design principles. This paper enriches existing design theories in eParticipation with a focus on collaboration co-creation for novel policy formulation rather than deliberation, and provides actionable guidance for system designers.

Keywords:

eParticipation, Citizen Co-Creation, Open Government, Design Science Research, Design Principles

Introduction

Today, governmental organizations emphasize openness and transparency (Obama 2009). The participation of citizens in governmental processes aims for greater inclusion and transparency in the democratic decision making process (Medaglia 2012). In light of this shift, we are introducing the concept of ‘citizen co-creation’, which goes beyond the notion of citizen participation for greater transparency and higher accountability (Macintosh 2004). Citizen co-creation describes the process in which citizens take an active role to improve the outcome of policy making, that is, to develop a policy solution for a complex policy problem (Brunswick et al. 2013; Macintosh 2004). Citizen co-creation implies collaborative relationships between policy makers and citizens as well as among citizens. Within these collaborative relationships individuals build upon other’s contributions to develop a novel integrated policy solution (Majchrzak and Malhotra 2013). Information and communication technologies, and in particular web 2.0, offer policy makers new opportunities for implementing citizen co-creation as they afford online co-creation environments in which citizens can collaboratively work together with other citizens, experts, and politicians in an asynchronous or synchronous mode without being geographically collocated (Nam 2012; Mossberger et al. 2013). In this article we empirically conceptualize the design of such an online citizen co-creation environment considering co-creation as collaborative process for developing integrated policy solutions for complex policy problems.

The development of novel policies require sophisticated technical knowledge as well as insights into complex social and political realities (Fischer et al. 2000). Policy innovations regularly relate to complex problems such as ensuring a healthier society, reducing energy consumption, or improving education, and imply a thorough understanding of complex human behavior (Shafir 2013). In addition, policy problems can hardly be decomposed into small subtasks which can be solved independently as novel policies require consensus about one final policy solution which integrates the knowledge from different areas (Fischer 2000). In summary, policy problems are complex, hardly decomposable, and intangible in nature. Thus, collaborative co-creation of a diverse set of citizens is needed to develop integrated solutions for complex policy problems (Majchrzak and Malhotra 2013).

Scholars from various disciplines have shown increased interest in citizen participation and openness in policy making (Macintosh, 2004a; Mahrer & Krimmer, 2005; Medaglia, 2012; Susha & Grönlund, 2012). The emerging research fields of eParticipation and eDemocracy¹ demonstrate

¹ There are additional terms and concepts like eGovernment (Wimmer, 2010) and ePolitics (Wattal, Schuff, Mandviwalla, Williams, and Christiane, 2010) that also shows overlaps with the research emerging on eParticipation. For a detailed review we refer to (Medaglia, 2012; Susha and Grönlund, 2012)

the role of information systems in this scholarly discourse (Susha & Grönlund, 2012). EParticipation usually refers to the use of ICT to support democratic decision-making (Macintosh, 2004a; Medaglia, 2012; Ø. Sæbø et al., 2008; Susha & Grönlund, 2012). In this context, Macintosh (2004a) suggests that there are different levels of eParticipation ranging from enabling to empowerment and highlights that eParticipation may happen at various stages of the policy making process. Scholars measure the effect of ‘openness’ in eParticipation in terms of civic engagement effects, deliberative effects, and democratic effects (Sæbø et al. 2008). While the field of eParticipation is undertheorized and lacks conceptual clarity and systematic knowledge building, there is one principle building block in theoretical contributions on eParticipation: Openness and the use of ICT is - often rather ideologically - considered as *generative mechanism* for deliberation and democracy, measured in terms of civic engagement effects, deliberation, and democratic effects. Surprisingly, this field of research pays little attention to the actual ‘outcome’ of policy making, that is, how citizen may enable them develop novel policy solutions for complex policy problems (Morçöl 2005; Nam 2012). In addition, scholars pay little attention to web 2.0 technologies despite their potential to collaborate with citizens in the process of co-creating a novel policy solution. Neither do existing contributions focus on *collaborative* co-creation processes, in which citizens do not work individually but deeply engage in the dialogue to develop an integrated solution, nor do they propose design principles that afford this co-creation process where deep interaction and exchange is required (e.g. Linders 2012; Lee et al. 2012; Hilgers and Ihl 2010). The gap remains to develop *actionable design principles* for making use of information and communication technologies, and in particular web 2.0 that allow for the development of novel policies through collaborative co-creation.

The theoretical assumption for citizen co-creation being generative for innovation is the *diversity* of the actors in terms of their expertise (Boudreau and Lakhani 2009; Boudreau et al. 2011; Füller et al. 2012; Majchrzak and Malhotra 2013). In addition, co-creation assumes that *collaboration* among different (external) actors, implying the joint generation and evaluation of innovative solutions for complex problems, is a central mechanism to develop solutions for complex hardly decomposable problems (Majchrzak et al. 2012; Füller et al. 2009). Diversity and collaboration are particularly important if the problem is complex and cannot be easily decomposed into different independent subtasks. Solutions for complex problems resulting from co-creation integrate diverse skills and knowledge (Boudreau and Lakhani 2009; Afuah and Tucci 2012; Boudreau and Lakhani 2013). Thus, the design of the online co-creation system needs to afford collaboration and not just relationships without deep knowledge exchange, and should avoid constraints, which may hold back citizens from engaging with others in the collaborative process (Majchrzak and Malhotra 2013). As such, our paper examines the following research question:

What design principles of a citizen co-creation system are required so that the system affords knowledgeable citizens to collaboratively formulate novel policies?

This paper particularly addresses four critical aspects of online citizen co-creation and actionable design theories. First, online citizen co-creation spans different stages of policy making (Brewer and DeLeon 1983; Brunswicker et al. 2013; Macintosh 2004, Skok 1995). We are particularly focusing on the stage of policy formulation. Second, we will emphasize the participation of what we call ‘knowledgeable citizens’. Research suggests that participants with domain-specific knowledge and a higher expertise are particularly relevant to move ideas forward towards realization and implementation (Füller et al. 2012; Lüthje 2004). Thirdly, we are particularly interested in the socio-technical design of an online co-creation system and the affordances for collaborative co-creation (Bostrom et al. 2009; Majchrzak and Malhotra 2013). Thus, we aim to develop actionable design principles, which allow for the design of citizen co-creation systems that afford collaborative co-creation of novel policies.

We tackle this research with a design science research approach. During a 22 month intense research project, we followed the three major steps of a design science research project defined as (1) analyzing, (2) designing, and (3) evaluating (Österle et al. 2010). The project was concerned with an online citizen co-creation system for the State Government of North Rhine Westphalia, Germany. The system aimed at innovating the existing ‘one world policy’ jointly with knowledgeable citizens integrating different fields of expertise, including Energy and Environment, Fair Trade, Universities and Scientific Research, Media & Culture, Health, Economy, Education, Peace, Migration and Partnerships. Furthermore, cross-topic aspects such as knowledge in the field of policy development, legal concerns, and culture related experiences constitute the second group of required skills (Sidney 2007).

The paper will be structured as follows: First, we characterize public policy innovation problems, describe the public policy innovation process, and present a design framework for developing design principles for citizen co-creation systems which afford collaborative co-creation. Afterwards, we present details on our design science project. Finally, we report and discuss the implications of our design science project for design theory and design practice and point toward future research.

Conceptual Background and Design Framework

In the following, we briefly introduce the public policy development process and discuss the specific nature of public policy problems to be solved in the policy formulation stage. Afterwards,

we present our theoretical anchor for developing design principles for co-creation systems, which afford collaborative co-creation to citizens in the policy formulation stage.

Complex Policies and the Need for Policy Co-creation

Literature on eParticipation and public policy furnishes different stages of citizen participation in the policy making and policy development process (Medaglia 2012). The public policy development process includes a set of distinct stages: The (1) agenda setting, (2) policy formulation and decision making (3) policy implementation (4) policy long-term evaluation and termination (Brewer and DeLeon 1983, Medaglia, 2012). To initiate the development of a novel policy, the *agenda setting* phase focuses on the recognition of the policy problem and the specific policy issue and results in the serious consideration of a policy issue in the political agenda (Jann and Wegrich 2007). The stage of *policy formulation and decision-making* is a critical stage for the development of novel policy solutions. In this stage action alternatives for solving the policy problem are formulated and a final alternative is selected and adopted. This regularly takes place in formal governmental processes. The formulation and adoption of a policy solution implies not only complex problem solving activities - just like in corporate innovation activities - but also the complex conflict resolution and bargaining within and between public and private stakeholders (Mayntz and Scharpf 1975).

As our paper is particularly concerned with the involvement of external citizens during the policy formulation and decision making stage, there are three dimensions of the policy innovation problem - which we refer to as the 'policy challenge' – which highlight the specific nature of citizen co-creation and the importance of co-creation in which knowledgeable citizens build upon each other's ideas and jointly develop an integrated policy document: (1) *intangibility*, (2) *complexity*, and (3) *decomposability*.

First, policies are intangible in nature, where future value and meaning is socially constructed (Nijssen et al. 2006; Vargo and Lusch 2004). In contrast to the corporate services innovation context, where the value of a new service is 'individual' and depends on the specific context of each individual customer, the future value of a new policy relates to welfare and justice in a collective community (Lindgren and Jansson, 2013; Della Rocca 2000). Taking the focus on social welfare and the intangibility of policies into account, a co-creation system should reflect these characteristics with respect to the need for dialogue-intensive co-creation activities that allow citizens to properly express and discuss the intangible nature of policies.

Second, the new policy development process regularly relates to complex problems and thus, implies a thorough understanding of complex human behavior, institutionalized decision making, and complex structures of manifold interests' representations (Shafir 2013). This adds substantial

complexity to questions of relevant responsibilities, the weighting of topics, and relevant stakeholder coordination (Riege and Lindsay 2006). Consequently, the design of a citizen co-creation system must consider both aspects including the possibility of systematically integrating different point of views and simultaneously allowing a coherent policy formulation process.

Third, the policy development process cannot be fully decomposed into small subtasks which can be solved independently as novel policies require an overall consensus about one final policy solution which integrates the knowledge and experience from different policy domains and contexts (Fischer 2000). Since the overall objective is to develop a consistent policy document and consistent set of policy tools, the partial decomposability – as we refer to this – needs to be considered (Jann and Wegrich 2007; Sidney 2007). In other words, a citizen orientated co-creation approach needs to handle both, the need for domain related expertise and simultaneously the necessity to finally develop an integrated and coherent public policy.

System Design and Affordances for Co-Creation

The design of a co-creation system plays a constituting role in the process of co-creating a novel policy solution (Orlikowski and Scott 2008; Majchrzak and Malhotra 2013; Feller et al. 2012). It supports the joint formulation, discussion, and selection of suggested alternatives in which participants build upon each other' ideas to finally develop an integrated policy document. The aim of this paper is to develop an actionable design framework (Winter 2008) and actionable design principles for the design of such co-creation systems. To do so, we take a socio-technical view of system design, which acknowledges that human elements are just as important as the technical ones in ensuring the functioning of the system (Orlikowski and Scott 2008; Markus and Majchrzak 2013). We anchor our design science research in the relational concept of affordances (Gibson 1979; Zammuto et al. 2007; Markus and Majchrzak 2013), which emphasizes that technologies yield an 'action potential' for a particular user with a particular intention. They are significantly different from features which are attributes of the technological system but describe the relationship between a particular technological object (a system, a feature, a tool) and the user who intends to use it. Not just technologies hold affordances but also individuals and organizations do. In accordance with information systems research, we define affordances as 'the possibilities for goal-oriented action afforded to specified user groups by technical objects' (Markus and Silver 2008, p. 622). Thus, we argue that the co-creation system needs to be designed in a way so that it affords a very specific user group – the knowledgeable citizens – the ability to collaboratively co-create a policy solution during the policy formulation stage. As we have highlighted above, the affordances related to two critical generative mechanisms of co-creation: *Diversity*, and *collaborative* creation of knowledge through integration of different perspectives (Boudreau and Lakhani 2009; Boudreau et al. 2011; Majchrzak and Malhotra 2013;

Tsoukas et al. 2009). Diversity relates to the expertise diversity, that is the differences in the knowledge domains of the knowledge citizens that are generative for generation of novel solutions related to a particular policy problem and theme (Majchrzak and Malhotra 2013). Collaborative co-creation implies that these diverse perspectives are integrated and recombined through conversation and new knowledge creating dialogue (Tsoukas et al. 2009). A precondition for co-creation to emerge is, that there is an exchange relationship among the participants. From an exchange perspective, this relationship can be characterized with the following dimensions: The actors (with whom?), the tasks (what?), and also the contextual factors and the process (how?) (Anderson and McFarland 1999; Füller et al. 2011; Faraj et al. 2011b). Such an exchange relationship is a necessary condition only. It does not yet afford co-creation. For co-creation to emerge, the system design needs to 'shape' the collaborative co-creation process and equip the actors with an action potential to co-create a complex policy solution. Co-creation requires combination and re-combination of different viewpoints along this exchange mechanism. In addition, it builds upon an intensive feedback process, and the emergence of a dialogue in which different insights and perspectives are integrated (Wright 2013; Tsoukas et al. 2009). To identify the design principles for co-creation to emerge from exchange relationships, we structure the design framework into three dimensions: namely (1) the co-creation actors, (2) the co-creation tasks performed by these actors and (3) the contextual factors and processes of co-creation (Anderson and McFarland 1999; Füller et al. 2011; Faraj et al. 2011b). For each dimension we will develop design principles, which are generative for affording collaborative co-creation.

(1) Co-creation Actors: During the co-creation process of a policy, citizens need to establish co-creation relationships with a *diverse* set of participants including citizens and policy makers with different backgrounds and expertise (Majchrzak and Malhotra 2013). This diversity is critical in order to generate novel solutions. However, integration these diverse perspectives requires co-creation and social exchange, as without a discourse, perspective taking, and recombination of existing knowledge (Tsoukas et al. 2009). Thus, co-creation relationships should be built upon activities like proposing ideas, commenting on others thoughts, and making changes to contributions to the policy document. Reciprocity along dyadic knowledge creation relationships is a critical so that co-creation can emerge and be sustained. Co-creation also needs to move beyond a dyadic understanding of co-creation relationships as discussions and dialog are 'embedded' in subgroups of the co-creation participations with which the participants establish relational value and social capital through deep communicative exchange and working together on tasks (Faraj et al. 2011b). The design of the co-creation can afford or hinder participants when co-creating a policy with different actors as they establish co-creation relationships through policy ideas and discussion on particular policy topics. Consequently the design of the citizen co-

creation system is guided by the following question: *Q1: What design principles of the co-creation system ensure that a diverse set of actors is afforded the ability to establish co-creation relationships in formulating the policy?*

(2) *Co-creation Tasks*: Knowledgeable citizens have certain intentions as to what content or activity of public innovation they want to contribute and co-create with policy makers and other citizens during the policy formulation. Knowledgeable citizens with expertise in sustainability may engage in public innovation activities related to alternative energies. Furthermore, there may also be regional dimensions to the tasks: Some citizens may be specifically interested in local political activities but not in activities at the state level (McAtee and Wolak 2011). Thus, the natures of tasks as well as the desired activities have direct implications for the required expertise in a specific policy domain and know-how about constitutional law and regulations (Shaw 2003). Some citizens may be more interested in the generation of new ideas and proposals for public policies, while others may prefer being actively involved in improving and shaping the ideas (Nabatchi 2012). As knowledgeable citizens may take different roles – as idea generator, idea evaluator, idea integrator – the task design needs to support the different roles that are required in the policy formulation stage so that deep exchange of knowledge emerges (Faraj et al. 2011a; Koch et al. 2013). So we assume that the tasks need to afford both diverse contributions and roles and activities for integration. Against this background, our research is guided by the following question: *Q2: What design principles ensure that the co-creation tasks yield affordances for co-creation among knowledge citizens in formulating the policy?*

(3) *Contextual Factors and Processes of Co-creation*: The third perspective focuses on the context of the co-creation process as well as specific process mechanisms that shape the co-creation exchange and co-creation interactions (e.g. technological functions and tools used in the co-creation process, boundary conditions (Faraj et al. 2011b). In light of the specifics of public policy problems to be addressed in the policy formulation stage, we assume that the process should reflect the co-creation of complex and hardly decomposable tasks and ensure that diverse actors join the activity and also make sure that the themes that are discussed also emerge over time. Most importantly, we assume that the process and technological features play a critical role in affording knowledge integration, or even hindering it (Faraj et al. 2011a). Thus, our design science project is guided by the following guiding question: *Q3: What design principles ensure that the co-creation processes and other contextual factors yield affordances for co-creation in formulating the policy?*

Method

Design Science Research Approach

To address our overall research question, we chose a design science research approach (Checkland and Holwell 2007; Baskerville and Myers 2004). In its essence, design science is a four-staged process: the first stage is concerned with the problem identification stage where researchers and practitioners collaborate in diagnosing the problem to be solved and theorize about how to solve it; the second stage involves the collaborative application of theory to guide action aimed at remedying the problem – the design stage (Österle et al. 2010). The third stage focuses on the evaluation followed by the diffusion stage (4). In information systems research, the design science approach, which is often discussed as being similar to the action research approach (Baskerville 2008; Baskerville and Myers 2004; Butler et al. 2008), is considered as particularly adequate as it provides a tight fit with system development and allows the identification and development of system design principles (Kohler et al. 2011; Lindgren et al. 2004; Baskerville and Myers 2004). Thus, design science seems to be highly appropriate for this research effort which aims to advance our understanding of the design of online co-creation systems for knowledgeable citizens and to develop design principles of pragmatic relevance (Winter 2008). Just like action research it subsumes systematic trial and error loops which allow iterations of planning, acting, observing and reflecting while aiming at a joint learning process of the research team, the participating subjects as well as other involved stakeholders (Wadsworth 1998; Kindon et al. 2007). Due to the particular nature of online co-creation in a public innovation context, the research team required deep insights from an insiders' perspective and the learning process itself was the core of the study (Street and Meister 2004).

In an effort to ensure methodological rigor, this study's approach is based on a three step design science approach (diffusion was not possible in this research cycle) and iterates in a 22 month study project (Baskerville and Wood-Harper 1996; Susman and Evered 1978). The first stage focused on the exploration and qualitative evaluation of our design framework for designing online co-creation systems for knowledgeable citizens based on non-online artifacts and narrative representations (e.g. PPTs, screenshots, written descriptions, narrative, etc.). To do so, we relied on explorative expert interviews and project related expert workshops to reflect on the component related specifics of our framework. The second stage focused on the design and evaluation (third stage) of an actual online co-creation system. Based on direct participation and observation of the online co-creation project we (evaluation stage) detailed our understanding of designing online co-creation systems and derived affordances and deduced design principles for designing online co-creation in a public sector setting.

Project Settings and Background Information

In 2011, the research team and the State Government of North Rhine Westphalia, Germany, decided to perform a design science research initiative on online citizen co-creation in the political area of a ‘One World Policy’. The One World Policy strategy specifies the political actions of North Rhine Westphalia related to political, economic, and social as well as cultural policies for developing and emerging countries. Our research team directly collaborated with the project team of the State Government to design and implement the online co-creation project. Thus, the research setting allowed the researchers to conduct design science in practice with the direct involvement of practitioners as co-researchers. Even though the practical context put some constraints towards the planning and implementation of our two action cycles, it offered the research team the opportunity to directly reflect and act upon the design of online co-creation in practice.

The research project started in February 2011 and ended officially in January 2013¹ (see annex Table I: Background of selected experts

Expert No.	Background and experience	Interview Date
Expert No. 1	Domain: Public sector (Department Manager) Experience: 15 year domain specific experience Projects: In charge for 3 co-creation projects in the public sector	January 2011
Expert No. 2	Domain: Public sector (Department Manager) Experience: 7 year domain specific experience Projects: In charge of 5 co-creation projects in the public sector	January 2011
Expert No. 3	Domain: Innovation consulting (CEO) Experience: 12 year domain specific experience Projects: In charge of more than 30 co-creation projects in public and private sectors	December 2010
Expert No. 4	Domain: Industry (Innovation Manager) Experience: 20 year domain specific experience Projects: In charge of 4 co-creation projects in the private sector	December 2010

1.

Table for details on key milestones). To collect deep insights about the specifics of online co-creation with knowledgeable citizens we initially (December 2010 & January 2011) conducted four expert interviews. The experts came from different professional backgrounds including two with 7 years and 15 years respectively public administration experience, one with a public sector

¹ although it was interrupted by an unexpected brake due to an early election in North Rhine Westphalia, Germany

participation consultancy background (12 years of domain specific experience), and finally a manager with more than 20 years of experience in co-creation and collaborative processes in innovation. All four experts had already been in charge of several co-creation projects. The explorative character of the interviews enabled us to gain a deeper understanding of the way of thinking and line of arguments.

Furthermore, we conducted three workshops with our project partner, the state government, and invited experts from universities, foundations, and other domain related NGOs. These workshops were planned as well as prepared by the research team and contained PowerPoint presentations, online accessible best practices, background information in the form of research studies and were completed by workshop notes and protocols. In total we were able to rely on roughly 380 pages of documented discussions and observational notes during this early project phase. In line with our research approach, these information and insights were not gathered for statistical analysis but rather for developing a comprehensive understanding of the research setting.

Moreover, we initiated and took part in twelve meetings in Düsseldorf, Bonn, and Munich and numerous project related telephone conferences, which however focused more on the project management progress, than on scientific research purposes. These meetings were documented by meeting protocols. In addition, together with our project partners we attended as active participants three topic related workshops with selected citizens and experts. During the second design science stage, the research team actively engaged in designing, developing, and managing the co-creation platform from a concept, design, and software related perspective. Furthermore, we actively recruited relevant knowledgeable citizens, activated them on the platform, and took part in the community management on the co-creation platform. The online citizen co-creation initiative resulted in a novel policy development for the One World Strategy, including new objectives, programs, and specific project suggestions, such as new cooperation programs integrating universities, research institutes, and German as well as e.g. Ghanaian firms.

The Design Science Process

Problem Identification

To delineate in more detail our design science problem related to the question of how to design a system so that it affords co-creation and collaborative formulation of a policy, we conducted explorative expert interviews with selected practitioners from different backgrounds (see Table in the Annex). The explorative character of the interviews enabled us to gain a deeper understanding of the challenges of designing online citizen co-creation. Furthermore, the interviews helped us to

refine our theoretically anchored analytical framework and to transfer them into the design science research setting. Together with the project owners' team (ministry experts) we designed three workshops with internal as well as external experts, to detail problem specification with respect to system design components and prepare the system design and its development in the following phase. Following our research question, we aimed to identify design principles, which ensure that co-creation systems afford knowledge citizens the ability to collaboratively formulate novel policies. Therefore we used the above introduced generic three-dimensional framework of 'Content and Activities', 'Contextual Factors', and 'Co-Creation Actors'. Based on the theoretically deduced affordances on how to design online citizen co-creation environments so that citizens actively participate in an active and collaborative policy development, we subsequently designed and prototyped the new system design.

System Design

The development of the design principles went hand in hand with the planning of the design implementation of the online co-creation system. The research team detailed the design of the technical features of the system and also detailed the facilitation mechanism and interventions. To do so, the research team worked in close collaboration with the representatives of the state agency and directly interacted with the participants of the co-creation initiative. Weekly meetings ensured a continuous dialog about the ongoing process. After the first release (going live), the online co-creation system was available for a 12-week period in order to formulate a novel policy for the 'One World Strategy' of the state government. During the design phase, the research team also designed the evaluation of the system and set-up a database structure to track all necessary participants' activities on the platform.

Dimension I: Co-Creation Actors

Citizen Co-Creation Relationships: A co-creation system should foster interaction among registered participants and ensure that such interactions evolve over time into a deep knowledge exchange. Personal profiles and the possibility to write messages to other participants, or comment on others contributions, and evaluate them afforded that dyadic relationships across different expertise areas were established. The transparency also made it possible that reciprocity and, in turn, and also deeper exchange of knowledge emerged (Posey et al. 2010; Chan and Li 2010). Furthermore, we integrated a dynamic notification system, in order to inform other participants via email that someone had, for instance, commented on their contribution. This made to sure that system afforded self-organizing of co-creation relationships as such features triggered awareness, and also additional response. Besides self-organizing, we also considered human

facilitation as a critical element to support co-creation, and established a particular role for this. We founded a team of community managers, who had access to special platform features to guide, steer, motivate, evaluate and manage the community. The community managers welcomed new participants, asked for more detailed descriptions or gave ‘just’ serious feedback, and tried to trigger constructive discussion by linking content to other community members. Moreover, we invited a group of different experts within the field of one world policy to be active on the platform. They encouraged the dialogue among expertise with different expertise, and also facilitated that conflicting views were integrated.

Policy Maker Engagement: To ensure a true co-creation activity among all actors that are required to develop a new policy, we suggest the involvement of a diverse set of policy experts as another very important design principle. From discussions with participants we know that if different political stakeholders are involved, the dialogue is encouraged as the policy making process is considered as ‘real’ and authentic. Diversity of experts is critical to capture a wide spectrum of expertise in the policy formulation stage. In addition, the active involvement of these policy experts affords a deeper and more extensive co-creation activity.

Dimension II: Co-creation Tasks

Task Decomposition for High Diversity: From a content and task perspective we implemented the co-creation system in such a way that the knowledgeable citizens with heterogeneous background and domain knowledge, experience, and interest could find different co-creation tasks to solve. First, the system design aimed at offering different fields of ‘one world policy’ related expertise. To support topic related modularity we developed a color-coded system, which was displayed on the front page as an animated category fan, but structured also the related sub-pages (see Figure 1). The second aspect relates to a vertical, competence or knowledge related differentiation, allowing participants with different knowledge levels to participate. In order to decompose the tasks into different maturity levels (e.g. ideas versus detailed policy description) we encouraged not only the upload of comprehensive contributions, but also provided the possibility to add comments to already existing contributions or write messages to other participants. Thirdly, cross-topic related tasks such as questions regarding policy development, legal concerns, or cultural related experiences constituted another dimension of realized task decomposability. The latter was technically positioned under each sub topic description in the form of guiding questions (see Figure 1). As policy development is very intangible in nature we provided a short summary of each topic on the topic related subpages and we explicitly asked for ‘central contents and activities’, ‘definition of success or failure’, ‘priorities and goals’, as well as ‘examples and best/good practices’, which would be transferable to the specific topic area. To conclude, the task supports the different roles that are required in the policy formulation stage (Faraj et al. 2011a;

Koch et al. 2013). Hence, system designers need to invest sufficient resources in task design and pay attention to the decomposition of tasks – both in a vertical as well as horizontal direction. Further, the intangibility of policies requires proper tasks design and decomposition, by providing background information, use cases, and guiding questions which act as boundary objects and make policies more tangible (Krogh and von Sieg J.H. 2012; Beckman and Barry 2009; Brunswicker et al.2013).

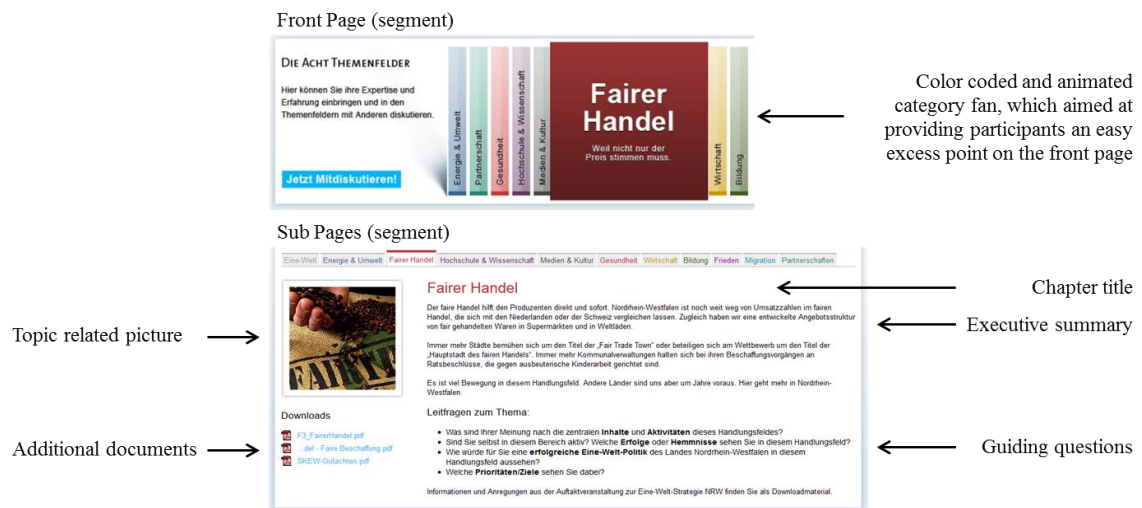


Figure 1: Example of Page Design

Task Integration: Task decomposition is not sufficient for co-creation to emerge. Thus, we designed the system in a way that it simultaneously allows content and task integration in order foster the integration of different perspectives and to develop an integrated policy solution. The system design plays a constituting role for the integration. First, we structured the sub-questions in such a way that they were always directly related to the respective topic. This enabled us to build topic related clusters with all relevant comments, additional documents, messages and evaluations. Second, we provided the ability to connect comments to multiple topics. With the ‘also relevant for’ function, we facilitated the integration of contributions across different policy areas as well as the interaction of domain experts working on different themes. This (technical) design attribute enables knowledge integration as it establishes a ‘cross-topic’ related task (task formulation) and ensures the multiple allocation of domain spanning knowledge. Third, we explicitly asked for short summaries in every comment, which should illustrate the value added of the respective comment to the overall topic. Fourth, we incorporated the aspect of task integration into the evaluation process of each contribution. By asking participants, whether this comment may contribute to the overall aim of co-creating a new one word policy, we accomplished a relevance related sorting of all sub-category related contributions. By implementing these four attributes we ensured that the diverse member crowd was able to build upon each other’s contribution and thereby co-create an integrated policy.

Support of Content Enrichment: Content development and enrichment is defined as one of the core functions to facilitate co-creation and knowledge integration. If participants upload a final policy document or a final policy solution there is not much opportunity for the enrichment of ideas and perspectives. Thus, we designed the system in a way that the citizens uploaded first drafts, initial ideas, and additional materials in order to allow a mutual, feedback orientated co-creation process. In order to encourage this behavior we explicitly asked for drafts and indicated the possibility to further develop those initial thoughts into more elaborated versions. A technical ‘versioning-function’ supported this design feature. Second, contributions in the form of stories, best practices or experiences triggered much more discussion and feedback than for instance statistic based arguments. Thirdly, we clearly communicated the importance of writing comments and messages as well as evaluation and tried incentivize those behaviors.

Reward System for Co-creation: Reflecting the design phase, non-monetary reward, which foster knowledge collaboration and feedback processes are crucial in the system design (Posey et al. 2010; Chan and Li 2010). We learned that we needed to foster commenting and reciprocity in the dialogue as was perceived as rewarding for those that presented ideas and thoughts (Posey et al. 2010). Thus, we awarded those that actively sought response to their ideas, and those that gave active feedback to the comments they received and helped the co-creation process. This triggered even more co-creation and knowledge discourse. We also combined online and offline activities to implement reward mechanisms that foster collaboration. Events with other community members, experts or even politicians served as special forms of recognition and provided an ‘offline-environment’ to further develop ideas and concepts, both on the personal as well as group level. Further, we provided the possibility to be selected for an offline discussion with ministry experts, where participants were encouraged to discuss and to respond the ideas, followed by a group dinner with the ministry.

Dimension III: Contextual Factors and Processes of Co-creation

Co-creation Process Integration: To successfully engage participants in the co-creation activity we implemented different co-creation stages within the co-creation system: exploration, contribution, collaboration, and evaluation. During the *exploration stage*, we addressed the following process design features: First, we ensured that the most relevant content (e.g. recent contributions, new members, activity stream etc.) were easily reached, user-friendly, and could be found on the start page. Second, we developed the personal profile area in such a way that participants were able to explore the content which was most valuable for them. The latter was realized by filtering the personal activity stream related to the user's competencies, past activities, and actively defined favorites. Third, we implemented a search, sorting, and selection function into the different content related forums in order to explore the content via an open search

function, key words, pre-defined categories or activity related mechanism (e.g. most discussed contribution). In the *contribution stage*, we ensured that the participant was successfully guided in uploading his/her contribution to the different tasks areas. The contribution process was structured as following: We included a title, sub-title, short summary, full description, topic related questions, additional documents, key-words, categories, and current status of the contribution (draft, idea, concept etc.) as the main components. During the final stages of *collaboration and evaluation* our design focus was an active support of integration of contributions and collaboration among the participants. To ensure a high activity level we positioned discussion and evaluation buttons on the start-page. Furthermore, we provided several options to enter the discussion and the integration of contributions throughout the process. The participants were invited to add comments, messages, or additional documents. For instance, on every main subpage of a user-generated contribution, a button invited the user to write a feedback comment or start the evaluation.

External Integration: We developed processes and interfaces to systematically integrate external process owners (e.g. ministry officials) into the co-creation systems. Systemwide, we developed a specific user role for ministry officials/external university experts. This allowed them for instance to maintain a list with relevant contributions within their profile, add invisible comments (just readable by ministry officials/external university experts), or evaluate contributions by a special ‘expert evaluation’. Some ministry officials supported the core team as community managers and afterwards as leading actors gathering the insights from the platform and finally re-writing the ‘one world strategy’ together. Those co-creation design features ensured that the virtual co-creation process with knowledgeable citizens occurred not in a separated and potentially encapsulated processes, but also enriched the traditional policy formulation process within the ministry. Due to special roles on the platform (e.g. additional evaluation criterions), weekly status calls, and the structured condensation process, we were able to ensure a systematic connection between the online co-creation system and the internal processes of the ministry. This ensured an (1) early integration of selected ministry agents, the (2) definition of a separate role within the co-creation systems allowing them to evaluate, link, and elaborate on contributions more comprehensively than the normal user was allowed to, and (3) a leading role during the condensation and aggregation process.

Co-creation Enabling System Features: To afford co-creation, we implement a portfolio of features. Some features were particularly focused on affording diversity *within* a particular discussion thread in order to ensure that experts with different backgrounds collaborate and share their opinion related to a particular policy task. For example, we provided the possibility to write postings to each sub-category. In addition, we implemented features that allow for the

establishment of diverse co-creation relationships *at the network level* (Faraj et al. 2011b). Participants had the opportunity to write messages to other co-creation community members independent from the subcategory. In addition, we ensured that our features channeled the co-creation activities through a set of narratives (Faraj et al. 2011a), including front and back narratives, which foster collaboration and fluidity in the collaboration. Front narratives were visible to the overall ‘co-creation community’, whereas back narratives related to individual ‘substreams’. All occurring activities were gathered in differently filtered activity streams. The front-page activity-stream displayed all ongoing activities; each sub-topic had its own topic-filtered activity-stream. We learned that a features like animated topic fan, videos, or self-learning TAG clouds, are also relevant features to create a front narrative and keep the overall network engaged due to the visibility of the dynamics. We also made sure that the ‘evolution’ of the co-creation processes is transparent to the participants, in order to create ‘dynamics’. To ensure that individuals establish reciprocate relationships with other experts comment on already published posts or evaluate them, each profile provided a person-centric filtered activity wall. We made sure that all co-creation participants could be explored in a well-structured community overview. A set of functionalities (sort by, search and key words) afforded knowledge exploration.

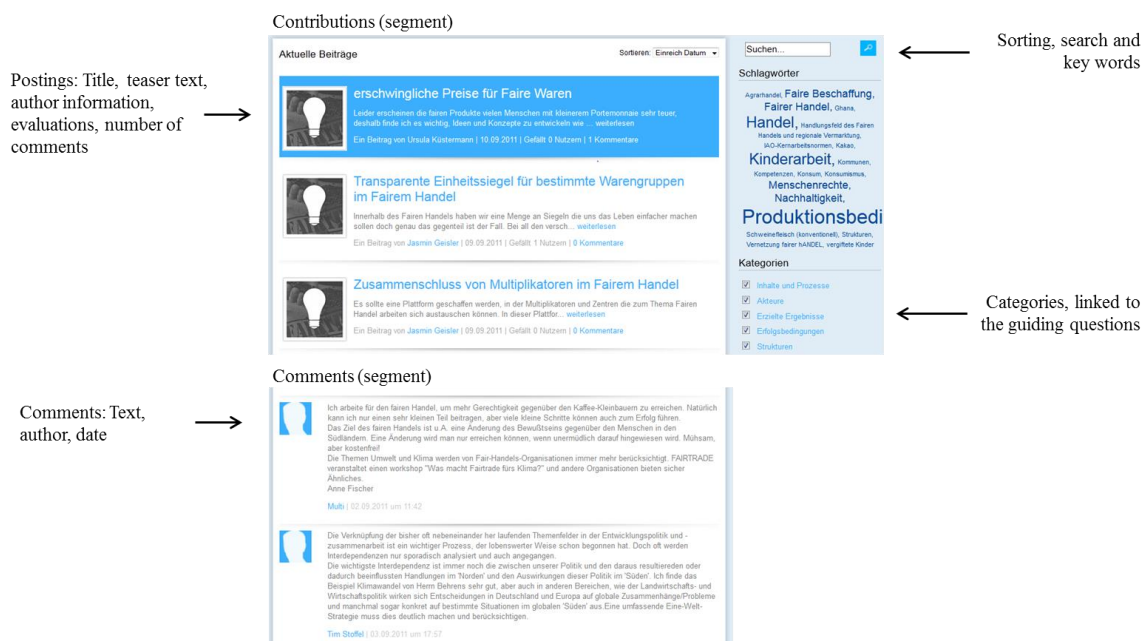


Figure 2: Example of Page Design for Citizen Contributions

Outcome of Co-Creation Process and Learnings

Overall, the designs of the system succeed to generate a high activity both of the visitors as well as of knowledgeable citizens who acted as policy advisors and engaged in the co-creation process. Indeed, we had a higher number of visitors (more than 50,000 unique visitors) who had the ability

to observe the co-creation activity. As our design research project was particularly concerned with the development of an integrated solution for a complex policy problem through co-creation, we focused on designing the system in a way to deeply engage the core group of 'experts' in the co-creation process (N =268). These experts deeply engaged in the co-creation process and submitted 251 submissions (in average 1,459 characters long), which directly related to the stated questions and tasks on the platform. These contributions were highly diverse and reflected the diversity of the expertise of the knowledge citizens. Besides those submissions, participants wrote 511 comments (in average 587 characters long) and uploaded 236 additional documents including best practices or secondary studies. Furthermore, the registered participants evaluated the main contributions over 500 times and wrote over 270 personal messages to other participants.

Thus, our systems afforded more than just exchange relationships without active dialogue and knowledge conversation. The system design afforded collaborative co-creation in which the citizens build upon each others ideas and thoughts and ensured that individual ideas evolved over time, and were integrated into solution. The high ratio of contributions and uploads of documents in relation to the total number of participants, and the high number of responses to comments indicates the deep knowledge exchange. In the end, the co-creation projected resulted in one integrated policy document, which was adopted and implemented. The newly developed 'one world policy strategy' was described by the responsible Ministry Dr. Angelica Schwall-Düren as a 'programmatic but also pragmatic political strategy, which discusses and finally defines fundamental principles, specific fields of action, political tools and tasks of North Rhine-Westphalia One world policy' (State Chancellery of North Rhine-Westphalia 2012). The final document consisted of 20 pages including a personal greeting paragraph from the ministry; some general thoughts on the development process, and the topic related, detailed description of the different policy fields. The latter includes very specific suggestions with regard to appropriate policy tools. For instance, with reference to the sub-module 'education and youth' the final policy includes the facilitation of cooperation between schools and other social groups, the special support for educators, and the intensified support of exchange programs where German as well as third world teenagers may establish relationships. Similar suggestions were defined with regard to the policy field of 'research and development', where new alliances, between corporations, research institutes, universities, and institutions working primarily in the field of development aid, were suggested and defined. Despite very specific policy areas and instruments for these areas, the policy document was integrated. Policy goals were addressed in all policy areas due to the true co-creation process.

Table 1: Design principles for online citizen co-creation

Dimension	Attribute/mode	Design Principle
Co-creation Actors	Citizen Co-creation Relationships	Offer a co-creation system, which fosters sustaining dialogue and knowledge integration among a diverse set of participants at the dyadic as well as subgroup level through personal profiles. Establish features for commenting on profiles, and features for triggering reciprocity in the dialogue. Consider a team of community managers, who have access to special features to ignite the discourse and collaboration among the participants, and also help to overcome the tendency of individuals to work on their own ideas rather than on developing those of others further.
	Policy Maker Involvement	Ensure an early integration of policy makers with diverse expertise, assign a role within the co-creation systems for them so that they can evaluate, link and elaborate contributions more comprehensively, and encourage them to take a leadership role during the condensation and aggregation process.
Co-creation tasks	Task Decomposition and Expert Roles	Ensure sufficient task decomposition both in terms of policy domain and maturity level to possibly ensure that a <i>diverse</i> set of knowledgeable citizens self-selects expert roles and contributes to their ideas and comments to particular subtasks
	Task Integration	Make the task structure visible and enable the integration of different tasks and related citizen created content to ensure that diverse community of knowledgeable citizens develop a policy that integrates the different view points through re-combination of knowledge, integration across subdomains, and elaboration of ideas so that they emerge into a greater 'whole'. Establish tasks and features that allow roles for this integration process to emerge.
	Support of Content Enrichment	Enable the enrichment of different contributions and simultaneously allow for content evaluation and prioritization via an evaluation system
	Reward System for Co-creation	Provide targeted group related rewards which foster collaboration among a diverse group of knowledgeable citizens; reward those that establish reciprocity relationships through active feedback-mechanism and dialogue
Contextual factors and processes of co-creation	Co-creation Process Integration	Ensure that the co-creation system captures the attention of the participants and channels the creativity and knowledge to the relevant system intersections where co-creation should take place.
	External Integration	Ensure that formal policy innovation processes are linked to the co-creation platform and vice versa. Connect policy makers and other experts with clearly defined interfaces, roles, and tasks to the co-creation system.
	Co-creation Enabling features	Provide supportive and empowering context and features that affords diverse relationships to emerge. Ensure front and background narratives, which channel participation in the co-creation both within a particular subtask but also at the overall policy level. Establish features that make knowledge evolution visible, and offer them the ability to explore the diversity of knowledge contribution.

Conclusion

Theoretical Contribution

In our design science research we drew upon multiple data sources and iterative processes to develop a design framework for a citizen co-creation system. Our design framework furnishes novel actionable design principles for designing co-creation systems, which cater for the particular context of formulating complex, intangible, and hardly decomposable public policies.

In this design science research we move beyond the use of ICT to involve citizens in the policy making process for achieving deliberation effects or participation reach. We are particularly concerned with the *outcome* of the citizen participation in policymaking, namely the policy solution, and the successful creation of *solutions* for complex policy problems. We argue that for successful development of such solutions, the system design needs to afford co-creation of citizens. The generative mechanism of this co-creation yielding novel integrated solutions is both *diversity* as well as *collaboration* through dialogue and knowledge integration. This social process of knowledge collaboration is required for developing integrated solutions in which individual citizens build upon others ideas rather than developing their own individual solutions. Thus, a socio-technical system design needs to transform an exchange relationship that forms around three dimensions - the actors (who?), the tasks (?), and the context and the process (what?) – into co-creation relationship. Along these three dimensions we require system design elements that afford co-creation and overcome the difficulties of integration diverse perspectives. In conclusion, our design framework goes beyond concepts and theoretical assumptions like technology fit and technology acceptance (Avital and Te'eni 2009, Sussha and Groenlund 2012), which have been advised in existing studies on eParticipation literature. It also enriches existing literature that focuses on the experience during co-creation, which has gained popularity in research on design principles for online collaboration systems (e.g. Kohler et al. 2011). It also advances existing theoretical contribution on knowledge collaboration in online communities which build upon the assumption of self-organizing of knowledge collaboration and the need for generative response to tensions that emerge in these communities (Faraj et al 2011a). Citizen co-creation design implies affordances for self-organizing of co-creation but also human facilitation and assigned roles, such as the community management team, that shape co-creation.

Policy formulation requires an integrated solution and this has significant implications on the design of the tasks and the process for c-creation. The system needs to enable citizens to self-select expert roles through task decomposition. This also drives diversity. In addition, it is crucial to 'integrate' different perspectives through design principles that focus on task integration and support boundary spanning across disciplines and deep integration and recombination of insights and perspectives through dialogue. In addition, knowledge citizens expect that their contributions are aligned with related policy activities, and thus, external integration is an important design attribute. Overall, we also learned that attributes like 'co-creation enabling features' and 'co-creation process integration' need to be carefully considered to afford the integration of different perspectives. To conclude we contribute to two literature streams in information systems.

With this article, we make a significant contribution to the flourishing research on eParticipation and eDemocracy¹ (Macintosh, 2004a; Medaglia, 2012; Ø. Sæbø et al., 2008; Susha and Grönlund, 2012). In this stream of literature, the use of ICT is - often rather ideologically - considered as *generative mechanism* for deliberation and democracy, measured in terms of civic engagement effects, deliberation, and democratic effects. We contribute to this stream of literature by shifting towards the policy ‘outcome’, and the co-creation process that enables the development of novel policies scholars. We provide a novel perspective by highlighting the need for *collaborative* co-creation processes, in which citizens do not work individual but deeply engage in the dialogue to develop an integrated solution. Diversity and collaborative knowledge processes are the generative mechanisms of co-creation. Co-creation goes beyond social exchange and social capital (Anderson et al. 1999, Faraj et al. 2011b). In addition, we consider the socio-technical system as a shaper as the co-creation process, and not just an enabler (a given component). Our design framework and the design principles that we develop in our 22-month long design science research are anchored in the concept of co-creation, which builds upon the theories of knowledge creation through dialogue and reciprocity in social processes (e.g. Tsoukas et al. 2009).

Beyond contributions to the mushrooming literature on eParticipation, our article contributes to literature on crowdsourcing and crowd-based problem solving (e.g. Majchrzak and Malhotra 2013). Unfortunately, this literature is often relatively silent about the role of technology in shaping the problem solving process. Majchrzak and Maholtra (2013) explicitly call for the considering of the IS dimension in crowdsourcing, which has been neglected in the growing literature on crowdsourcing (e.g. Boudreau et al. 2011). Information systems are ‘shapers’ rather than just enablers of crowd-based processes of problem solving, in which are large number of individuals identify novel solutions in a digitally enabled environment. However, existing system designs and literature fail to acknowledge the fact, that those individuals typically develop their own solutions rather than elaborating on other solutions (Majchrzak and Maholtra 2013). At the same time, complex problems like policy problems require the integration of different perspectives and elaboration of ideas and thoughts to find successful solutions. Thus, our paper responds to this call from scholars in the information systems field, and makes an actionable contribution through presenting a design framework and 9 design principles.

¹ There are additional terms and concepts like eGovernment (Wimmer, 2010) and ePolitics (Wattal, Schuff, Mandviwalla, Williams, and Christiane, 2010) that also shows overlaps with the research emerging on eParticipation. For a detailed review we refer to (Medaglia, 2012; Susha and Grönlund, 2012)

Practical Implications

From a practical and managerial point of view, our insights are of practical relevance for system designers and managers within public administration, politicians, and consulting agencies, which intend to virtually integrate knowledgeable citizens, experts as well as politicians into co-creation processes. When designing online citizen co-creation systems for knowledgeable citizens, system designers need to recognize that the sole invitation of the target group on the virtual co-creation platform is not enough. It is important to design the co-creation system so that it affords such co-creation through diversity and collaborative co-creation. Our design principles equip system designers and managers to answer key questions they might be confronted with throughout the design process: Such as what features to establish to ensure that a co-creative dialogue emerges? What roles to establish to ensure that participants co-create a policy? To provide clear guidelines our design principles help practitioners to plan, design, and successfully implement an interactive co-creation system with and for knowledgeable citizens and governmental bodies.

To conclude, system designers need to design co-creation relationships that move beyond mere 'exchange' relationships. They need to make sure that the technical system affords that a diverse group of knowledge citizens self-selects to contribute diverse perspectives towards a policy problem, and, most importantly, that these knowledge citizens engage in a collaborative process of recombination, integration, and refinement of policy ideas through dialogue as well as content enrichment. Our design principles may help them in doing so.

Limitations and Future Research

There are some limitations to be kept in mind, when reading and interpreting our results, which simultaneously imply further promising directions for further research. Firstly, the design framework and the design principles were drawn from the design science project with the State Government of North Rhine Westphalia in Germany in which we designed, conducted, and evaluated an online citizen co-creation system. In our approach, both practitioners and researchers jointly drew deep insights during the design and development activities, and brought situated knowledge into the research process. In turn, our theoretical and practical contributions may lack external validity and generalizability as the specific design science research setting may have influenced our theorizing and design activities (Munch and Verkuilen 2005). Thus, we propose that future research builds upon our design framework and our design principles and performs additional design science research activities in different co-creation settings. Such research can further strengthen our proposed framework and design principles, and increase their external validity and generalizability.

Secondly, our design science research methodology is not able to address questions of causality, e.g. with respect to the effectiveness of the designed and implemented co-creation system. Further research may build on our qualitatively gathered insights and compare different public sector focused co-creation systems in a more controlled setting (e.g. quasi experiment).

Thirdly, discussions and lessons learned were drawn from design science research within the government of only one state. Therefore, the development and implementation of the co-creation system might have been influenced by contingencies such as the characteristics of the governmental strategies, characteristics of the public agents and the attracted citizens, and state-specific regulations. Whether this is true is a constraint that needs to be further investigated. Further insight could be drawn from additional design science research projects in other governmental settings that complement our learning and further refine our propositions of appropriate design principles for online citizen co-creation.

Fourthly, in order to better understand the possibilities of co-creation in a public sector setting, we focused our research on the policy formulation phase. Although the analyzed approach might preferably fit in this particular stage of the policy development cycle, we believe that co-creation may provide also valuable insights when being applied in the other policy development stages. Hence, we encourage other researchers to examine our design framework and our design principles in other stages of the policy cycle.

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Annex

Table I: Background of selected experts

Expert No.	Background and experience	Interview Date
Expert No. 1	Domain: Public sector (Department Manager) Experience: 15 year domain specific experience Projects: In charge for 3 co-creation projects in the public sector	January 2011
Expert No. 2	Domain: Public sector (Department Manager) Experience: 7 year domain specific experience Projects: In charge of 5 co-creation projects in the public sector	January 2011
Expert No. 3	Domain: Innovation consulting (CEO) Experience: 12 year domain specific experience Projects: In charge of more than 30 co-creation projects in public and private sectors	December 2010
Expert No. 4	Domain: Industry (Innovation Manager) Experience: 20 year domain specific experience Projects: In charge of 4 co-creation projects in the private sector	December 2010

2.

Table II: Project activities and key milestones

Title	Date	Goal/Action
Workshop 'Citizen Co-Creation'	February 9 th 2011	Introduction into approaches, tool, and processes
Internal Working Groups	March 2011	Experts discuss the old strategy and potential tasks/topics
Kick-Off Workshop (Plattform)	May 11 th 2011	Key player, content, boundary condition
Workshop with selected Experts	May 30 th 2011	Definition of tasks; information material
Workshop Community Management	June 16 th 2011	Introducing partners into community management
Go-Live	June 20 th 2011	Go-live of the co-creation system (www.einewelt.nrw.de/start.php)
First Workshop (citizen & experts)	July 6 th 2011	Discussion and further development of existing content
Third Workshop (citizen & experts)	August 21 st 2011	Discussion and further development of existing content
End of the Online Consultation	September 10 th 2011	No upload of Contribution possible
Project Dinner with the platform winners and the minister	September 12 th 2011	Incentive for the most active citizens on the platform
Conference 'local vs. global' Düsseldorf	September 15 th 2011	Discussion with invited experts (round table)
Third Conference for development policy, Bonn	January 30 th 2012	Presentation and discussion of first results
Rewrite of the One World Strategy	February – May 2012	Experts & Selected Experts
Unexpected half year brake due to early elections		
Official Publication of the new Strategy	December 2012	
Official End of the Co-Creation Project	January 2013	

Table III: Workshop Setting

Workshop	Workshop description & Workshop Goal
Workshop I: Workshop on citizen co-creation – General introduction (N = 8)	The first workshop introduced our framework to project partners and experts. We aimed at reaching a similar mutual understanding of the design framework among the project core-team and gather suggestions for refinement from all participants. We also detailed the project objectives.
Workshop II: Motives and community management activities (N = 5):	The fourth workshop focused on the recruiting, activation, and motivation of platform participants. Drawing upon the expertise of our practitioners as ‘co-researchers’, we collected detailed information about the system design principles related to motives and engagement.
Workshop III: Task & topic discussion with selected content related experts (N = 7)	Parallel to the first, second, and third workshop, we set-up an internal working groups to work on the specific principles of online co-creation systems in the public sector. The focus was on the task and the topic. The goal was to find ways to structure the wide topic of ‘one world policy’, identify sub topics, define expected outcomes and relate them to overall political strategy. The results were discussed during the third workshop.

Annex G

Selbstdeklaration bei kumulativen Promotionen

Research Article I

Why Do Citizens Engage in Governmental Crowdsourcing Initiatives? Motives and Their Impact on Participation Behavior

Authors: Koch, G.; Hutter, K.; Füller, J.; Hilgers, D.

The majority of the work for this article has been done by Koch. This includes the conceptual framing, setup, community management, content condensation, and evaluation of the citizen-based crowdsourcing project “Aufbruch Bayern”. Koch was in charge of the data collection, the theoretical as well as conceptual work, and the design of the analyses, the interpretation of the results, as well as structuring and writing the paper. Hutter and Hilgers provided feedback on the formulation of the article. Füller supported during the analysis phase and provided feedback regarding the interpretation of results.

The following criteria are based on a suggestion by the University of Hamburg. The German explanation of each criterion is explained in the respective food note.¹

Estimation of the personal contribution (research article I) in percentage (1 -100%)

<i>Criterion</i>	<i>Personal contribution in percentage</i>
Concept and Planning	90%
Realization	75%
Writing of the Manuscript	80%

¹ **Konzeption/ Planung:** Formulierung des grundlegenden wissenschaftlichen Problems, basierend auf bisher unbeantworteten theoretischen Fragestellungen inklusive der Zusammenfassung der generellen Fragen, die anhand von Analysen oder Experimenten/Untersuchungen beantwortbar sind. Planung der Experimente/Analysen und Formulierung der methodischen Vorgehensweise, inklusive Wahl der Methode und unabhängige methodologische Entwicklung.

Durchführung: Grad der Einbindung in die konkreten Untersuchungen bzw. Analysen.

Manuskripterstellung: Präsentation, Interpretation und Diskussion der erzielten Ergebnisse in Form eines wissenschaftlichen Artikels.

Research Article II

How Open Government Platform Experience Shapes Citizens Democratic Skills, their Perceived Political Empowerment & Actual Participation Behavior

Author: *Koch, G.*

All work for this article was done by Koch. This includes the conceptual framing, setup, community management, content condensation, and evaluation of the citizen-based crowdsourcing project “Aufbruch Bayern”. Koch was in charge of the data collection, the theoretical as well as conceptual work, and the design of the analyses, the interpretation of the results, as well as structuring and writing the paper. Füller only served as a sparring partner during statistical data analysis.

Estimation of the personal contribution (research article II) in percentage (1 -100%)

<i>Criterion</i>	<i>Personal contribution in percentage</i>
Concept and Planning	100%
Realization	100%
Writing of the Manuscript	100%

Research Article III

Identifying Participants' Roles in Open Government Platforms and its Impact on Community Growth

Authors: Koch, G.; Hutter, K.; Hilgers, D.; Füller, J.

The majority of the work for this article has been done by Koch. This includes the conceptual framing, setup, community management, content condensation, and evaluation of the citizen-based crowdsourcing project “Aufbruch Bayern”. Koch was in charge of the data collection, the theoretical as well as conceptual work, and the design of the analyses, the interpretation of the results, as well as structuring and writing the paper. Hutter and Hilgers provided feedback on preliminary versions of the article. Füller provided feedback on the conceptual set-up of the analysis.

Estimation of the personal contribution (research article III) in percentage (1 -100%)

<i>Criterion</i>	<i>Personal contribution in percentage</i>
Concept and Planning	75%
Realization	75%
Writing of the Manuscript	90%

Research Article IV

Beyond Participation: Design Principles for Citizen Co-Creation Systems

Authors: Koch, G.; Brunswicker, S.; Füller, J.

The majority of the work for this article has been done by Koch. Due to the design science research approach, this includes the conceptual framing, setup, community growth as well as community management, and finally the condensation, evaluation, and finalization of the most promising contributions of the 22 month co-creation project “Eine Welt Strategie” initiated by the State Government of North Rhine Westphalia. Giordano Koch was in charge of the data collection, the theoretical as well as conceptual work, and the design of the analyses, the interpretation of the results, as well as structuring and writing the paper. Brunswicker provided feedback on the formulation of the article and supported relevant insights on theoretical foundation. Füller provided feedback on the writing of the article.

Estimation of the personal contribution (research article IV) in percentage (1 -100%)

<i>Criterion</i>	<i>Personal contribution in percentage</i>
Concept and Planning	100%
Realization	90%
Writing of the Manuscript	75%

Selbstdeklaration bei kumulativen Promotionen

Die vorliegende Einschätzung in Prozent über die von mir erbrachte Eigenleistung wurde mit den am Artikel beteiligten Koautoren einvernehmlich abgestimmt.

München, den 25.08.2014

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Giordano Koch

Annex H

Eidesstattliche Erklärung

Eidesstattliche Versicherung:

Ich, Giordano Koch, geboren am 13.07.1983 in Hannover, versichere [1] an Eides statt, dass ich die Dissertation mit dem Titel:

„From Open Innovation to Open Government:
A Multi-Level Analysis of Open Government Communities“

selbst und bei einer Zusammenarbeit mit anderen Wissenschaftlerinnen oder Wissenschaftlern gemäß den beigefügten Darlegungen nach § 6 Abs. 3 der Promotionsordnung der Fakultät Wirtschafts- und Sozialwissenschaften vom 24. August 2010 verfasst habe. [2] Andere als die angegebenen Hilfsmittel habe ich nicht benutzt. [3]

München, den 25.08.2014

Giordano Koch