Chapter 14

Transforming Municipalities: Drivers, Inhibitors, and Strategies in Mobile Government Diffusion

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Abstract

Purpose — To illustrate the current state of mobile government (m-government) diffusion in Germany and to explain what makes public sector organizations differ in their adoption behavior.

Methodology/approach — Based on 12 semistructured interviews with municipal IT decision makers, we apply grounded theory and quantitative content analysis to derive a framework of drivers, inhibitors, and strategies for m-government adoption. After that, we select four comparative cases to examine the contextual differences between municipalities.

Findings — Among the strongest perceived drivers for m-government adoption we find process improvements and citizen benefits; among the strongest inhibitors the ability to change and technical integratability. Furthermore, variance in the diffusion among municipalities can be attributed to contextual differences regarding financial situation as well as the mode of IT governance.

Research limitations — The results may possess limited generalizability due to the case study approach taken and the focus on German municipalities. Further studies in other national contexts are strongly encouraged.

Practical/social implications — Municipalities have the possibility to implement certain strategies such as intercommunal cooperation and increased citizen involvement to foster m-government diffusion. In doing so, information technology can serve as a driver of government transformation if responsibilities for IT and organization are effectively aligned.

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Originality/value — This is one of the first works to present an empirically well grounded framework and appropriate mid-range theory for m-government adoption on the municipal level. Beyond that, we introduce the concept of "transformational IT governance" as a strategy to align the municipal IT organization for sustained government transformation.

Keywords: Research paper; Mobile Government; Adoption and Diffusion; IT Governance; Grounded Theory; Case Studies

14.1. Introduction

Mobile internet connected devices are becoming more and more pervasive. In many industrialized countries, mobile broadband penetration has already surpassed fixed broadband subscriptions (ITU, 2010), which reflects the technological advances as well as the rising user expectations in this area. This does do not only offer the possibility to private businesses to advance in mobile commerce (Siau, Lim, & Shen, 2001), but also puts pressure on public sector institutions to innovate. Current interaction channels with citizen, businesses as well as with employees may be enhanced by appropriate mobile government (m-government) technologies, so that the processes and ultimately the services to the customer can be optimized (Kushchu & Kuscu, 2003; Trimi & Sheng, 2008).

However, such enhancements may sometimes imply fundamental changes to the internal organization and thus require transformational steps (Janssen & Shu, 2008). Analogously to private economy, we observe that public sector institutions take a different pace in innovation diffusion (Winkler & Ernst, 2011). Drawing on findings from a recent survey, our research question is: What exactly makes public sector organizations differ in their adoption of mobile government services?

Present literature tends to focus rather on technocratic aspects of m-government adoption and often lacks in empirical foundation (Al-khamayseh, Lawrence, & Zmijewska, 2006; El-Kiki & Lawrence, 2007; Kumar & Sinha, 2007; Kushchu & Kuscu, 2003; Kushchu, Kuscu, & Yu, 2007; Sandy & McMillan, 2005). We combine grounded theory and quantitative content analysis to develop a comprehensive framework on m-government adoption and apply this framework in four cases to determine the relevant contingencies in this context. As mobile government initiatives primarily occur at the local level (Borucki, Arat, & Kushchu, 2005), we chose the municipal decision makers as the object of analysis. This paper aims to contribute to current research inasmuch as we empirically derive factors which influence m-government adoption and generate appropriate mid-range theory to explain differences in the adoption between different entities.

The remainder of this paper is structured as follows: first we review related work on mobile government adoption, transformational government and IT governance. Then, the methodological approach is explained. After that, we present the derived adoption framework, which is used for the comparative case studies in the subsequent section. Finally, we summarize the findings and propose future work.

14.2. Related Work

14.2.1. Mobile Government in the Context of Transformational Government

Following the definition by Kushchu and Kuscu (2003), m-government can be defined as a strategy and its implementation involving the utilization of all kinds of wireless and mobile technology, services, applications, and devices for improving benefits to the parties involved in e-government. Akin to e-government, m-government may have different foci. For the purpose of this work we distinguish between three main interaction patterns: government-to-citizen (G2C), government-to-business (G2B), and government-to-government (G2G) (Trimi & Sheng, 2008).

M-government can be related to the theme of transformational government (Irani, Love, & Jones, 2008; Weerakkody Dhillon, Dwivedi, & Currie, 2008). Transformational government (t-government) describes the evolution of e-government from a technological focus to large-scale improvements (Layne & Lee, 2001). The emerging concept acknowledges that traditional e-government initiatives often have not achieved the expected benefits as they have simply overlaid technology onto the existing structures of the organization. This in turn now creates a stronger need for large-scale transformations that consider technology, processes and people at a time (Baum & Di Maio, 2000). However, the notion of t-government is yet not fully established (Janssen & Shu, 2008). Two views of t-government are predominant: t-government as a process (e.g., Baacke, Fitterer, Mettler, & Rohner, 2008) and t-government as a final stage of e-government (e.g., Baum & Di Maio, 2000; Weerakkody et al., 2008).

Although some authors argue that mobile government is rarely causing structural changes (Borucki et al., 2005), this work takes the view that the use of mobile technology for governments may require, as well as enable, comprehensive transformations of government processes (Kumar & Sinha, 2007). For example, Sandy and McMillan (2005) emphasize that process re-engineering is one of the critical factors for m-government success. Furthermore, m-government and t-government share a several common aspects of government modernization, such as customer-orientation, innovation, multichannel management, efficiency and effectiveness (Janssen & Shu, 2008). Thus, we conclude that they are closely related. M-government can be seen both as a trigger for and as an enabler in public sector transformation.

14.2.2. Mobile Government Adoption and Diffusion

Challenges and success factors of m-government adoption are widely discussed in e-government research (Napoleon & Bhuiyan, 2010). As the most critical issues, privacy and security as well as accessibility concerns are frequently mentioned (Al-khamayseh et al., 2006; El-Kiki & Lawrence, 2007; Kumar & Sinha, 2007; Kushchu & Kuscu, 2003; Kushchu et al., 2007; Sandy & McMillan, 2005). Besides that we find a long list of technical issues including infrastructure development, payment infrastructures, and compatibility (Kushchu & Kuscu, 2003; Kushchu et al., 2007); user-related issues such as preferences, quality, user friendliness, convenience,

acceptance, and education (Al-khamayseh et al., 2006; El-Kiki & Lawrence, 2007; Sandy & McMillan, 2005); as well as legal issues (Kushchu & Kuscu, 2003; Kushchu et al., 2007) and cost (Sandy & McMillan, 2005).

However, the rather young literature on m-government mostly draws upon conceptual work and single case studies and still lacks empirical foundation (Napoleon & Bhuiyan, 2010). Thus, success factors identified in existing adoption research can provide general normative guidelines, but do not account for the individual differences between organizations. A recent study by Winkler and Ernst (2011) indicates that public sector institutions differ in innovation adoption. They segment municipalities into four empirical clusters: *Innovators*, *IT-experienced*, the *Efficiency-oriented*, and *Laggards*. Out of these clusters, only the former two may be considered as early adopters. In this chapter, we build upon this classification to explain some of the differences between such public sector organizations.

14.2.3. IT Governance in the Public Sector

One major barrier for m-government adoption also stated by experts (see El-Kiki & Lawrence, 2007) refers to governance during initiation of an m-government project. IT governance has equally been mentioned as one of the core elements in government transformation (Janssen & Shu, 2008). From an organizational standpoint, any public institution can be horizontally divided in departmental areas and central units that perform cross-functional tasks such as information systems management (Brown, 1999). IT Governance defines the distribution of decision-making authority and integration mechanisms between these entities and may be classified into centralized, decentralized, or federal archetypes (Weill & Ross, 2004).

Governance mechanisms, which can be implemented at structural, procedural, and relational level, have been identified as a key to align IT with business organizations and achieve IT performance in private sector companies (e.g., Weill & Ross, 2004). Yet, little research has been conducted on mechanisms that contribute to IT governance within public sector organizations (Ali & Green, 2007). For instance, in a cross-industry survey reported by Weill (2007) public sector organizations clearly score the lowest IT governance index. This topic is recently also gaining practical relevance (e.g., Hoch & Payán, 2008) given that the fundamental differences between public and private sector may also call for different principles of IT governance (Sethibe, Campbell, & McDonald, 2007).

14.3. Research Method

14.3.1. Data Acquisition

We acquire data from 12 in-depth semistructured interviews with municipal IT decision makers. This object of analysis appears particularly suitable, since most

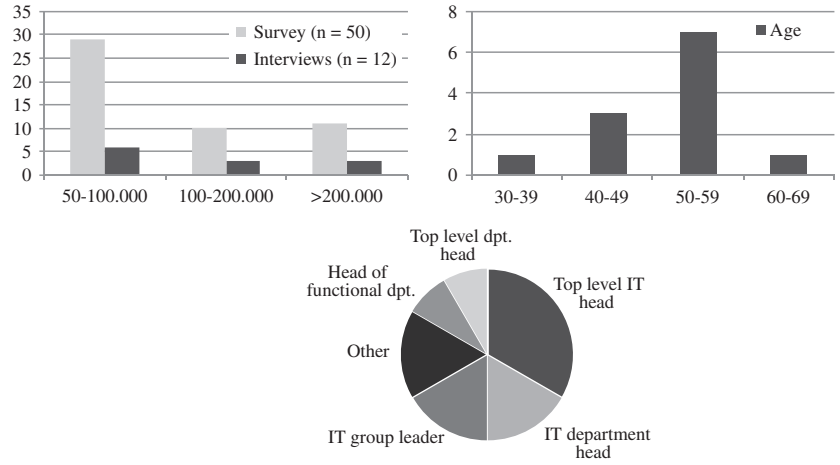

Figure 14.1: Sample (city size by inhabitants, interviewee age and job position).

m-government initiatives occur at the local level by the involvement of very few departments and workers, as Borucki et al. (2005) note. Interview contacts have been drawn from a prior survey (Winkler & Ernst, 2011) which features a representative sample of German municipalities ($n = 50$). Interviews took place between June and August 2010 and followed a common guideline (a. context, b. mobile applications, c. drivers, and inhibitors, d. stakeholders). Average duration of an interview was 54 min. amounting to 10.8 h total interview data, respectively 140 pages of transcription. The city size, demographics (100% male), and job positions of the interviewees are depicted in Figure 14.1.

14.3.2. Coding Procedure and Content Analysis

We combine grounded theory with quantitative content in a five-step approach to analyze the interview material. Grounded theory is contrary to other research methods as it seeks to systematically develop theory, rather than verifying or testing it (Glaser, 1992; Strauss & Corbin, 1998). Straussian grounded theory follows an interwoven process of open coding, axial coding, and selective coding. It is thought to be more prescriptive compared to the Glaserian approach (Niekerk & Roode, 2009). Our coding and calculations were performed using special software for qualitative analysis as well as a common spreadsheet program.

1. We incrementally performed open coding of the given interview material by two coders and retrieved an initial list of 173 codes. Average groundedness of a code, that is, number of quotations, is 8.3. Each code captures in average 28.3 words, which corresponds to a calculatory 53% of the total interview material.

2. Deviating from the Straussian procedure, we first arranged these codes according to basic categories (coding paradigm), before aggregating codes to mid-level concepts and categories. As the core phenomenon (the adoption of m-government services) was clear from the beginning of this study, we use an adapted Strauss coding paradigm (Strauss & Corbin, 1998) which jointly interprets causal and intervening conditions as drivers (conditions with a positive influence) and inhibitors (conditions with a negative influence). The resulting coding paradigm is illustrated in Figure 14.2.
3. We merged codes according to perceived semantic distance and partly sorted out codes with very few quotations. Simultaneously, appropriate mid-level categories were found within two of the basic categories to semantically structure these concepts. The result is a condensed hierarchical framework with total 42 concepts in four categories (see Section 14.4).
4. We determined the intercoder reliability (Neuendorf, 2002) of the condensed code set by recoding a sample of three interviews with switched roles. We considered an overlap in the quotation in both document versions as a *hit*, and calculated the reliability according to the following formula:

$$r = 2 \times \text{hits}/(\text{total codes}_{\text{coder A}} - \text{total codes}_{\text{coder B}})$$

   The resulting reliability of $r = 58\%$ can be regarded as a good result considering the number of different codes. For the subsequent analysis we joined both codings to a consolidated version.
5. For a valuation of the conditional variables, both of the coders went through all quotations belonging to the conceptualized conditions. We rated the relevant 1273 quotations on a three-point scale, where –1 represents an inhibiting, 0 a neutral, and +1 a driving influence on m-government adoption. The reliability of this rating was $\kappa = 0.67$ measured by Cohen's Kappa, which can be regarded as a very good agreement (Neuendorf, 2002). We calculated the influence of each variable as the average ratings of both coders. For the purpose of illustration, the resulting valuations have been transformed to an equidistant five-step scale (interval boundaries at –1.0; –0.6; –0.2; 0.2; 0.6; 1) where "--" represents a strong inhibitor, "-" a weak inhibitor, "○" a neutral influence, and so on.

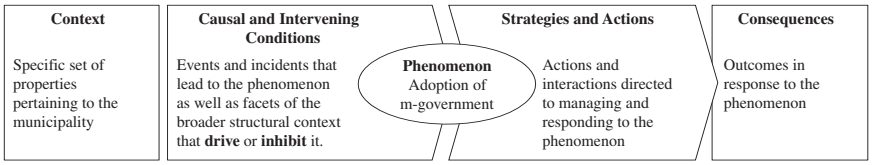

Figure 14.2: Used coding paradigm (adapted from Strauss & Corbin, 1998).

14.3.3. Case Study Approach

To investigate the variance in m-government adoption more in detail, we selected four cases from the sample. In qualitative research, the selected cases should be especially critical or revelatory with regard to the phenomenon (Benbasat, Goldstein, & Mead, 1987; Merriam, 1998). The replication logic (Yin, 2002) either dictates to select cases which are expected to yield similar results (*literal replication*), or opposite results (*theoretical replication*).

In this research, we followed the latter approach and based our case selection on three main considerations. First, we decided to choose one case from each of the empirical clusters provided by Winkler and Ernst (2011), as these groups emerged from statistic clustering which generally enhances variance. Second, within these clusters we preferred such revelatory cases which are characterized by a good clarity, quality, and openness of the interviewee. Third, as selection should also be based on organizational criteria (Benbasat et al., 1987), we took into account municipality sizes and selected two larger and two medium-sized cities. This allows for both, pairwise comparison and testing for size differences between these cases. Furthermore, we complemented the analysis with relevant documentation, such as strategy documents, organization charts, and press clippings which we additionally retrieved from interview partners and web sources.

14.4. Framework for Mobile Government Adoption

The developed framework saturates the theoretical categories from Figure 14.2 with appropriate concepts that play a role in m-government adoption. Figure 14.3 displays the results of the qualitative analysis with total code frequencies and valuations in brackets. The code frequency (#) can be interpreted as the relative importance of a concept, while the valuation (+/−) describes the strength of driving and inhibiting influences. For reasons of brevity, we briefly describe the main concepts in the following.

14.4.1. Contextual Variables

Contextual variables, on the one hand, concern properties of the municipality such as *size*, *economic profile*, and *budgetary situation*. On the other hand, we found properties of the municipal IT organization and IT architecture to be relevant for m-government adoption. Examples are *horizontal distribution* of the IT organization (cp. Brown, 1999), the *degree of external sourcing*, as well as *governance mechanisms* which are used to integrate IT with the functional departments. The complex influence of such variables should be elicited by the case studies presented in Section 14.5.

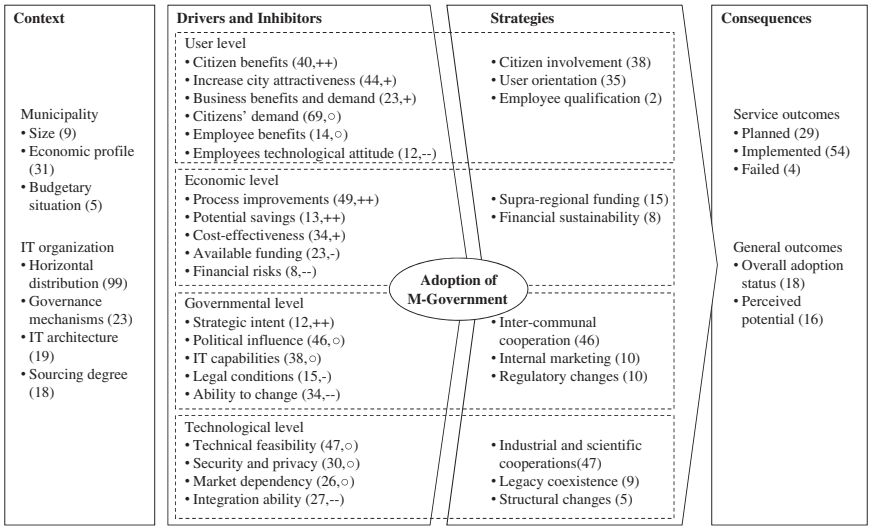

Figure 14.3: Framework for m-government adoption (including code frequencies and valuations).

14.4.2. Drivers, Inhibitors, and Strategies

Drivers and inhibitors are the factors that have either positive or negative influence on the municipality's decision on mobile government adoption. Strategies are the actions that are taken in response to drivers and inhibitors. In the interviews, these actions have been identified by key words such as "need/should/must be done." To group drivers, inhibitors, and strategies, four self-evident levels emerged as categories: user, economic, governmental, and technological level.

14.4.2.1. User Level On user level we mainly find drivers which relate to the *expected benefit* of m-government for the three target groups (citizens, businesses, and governmental employees). Some cities also aim to *increase* their *attractiveness* by offering mobile services, while others clearly doubt such kind of impact. The highest group-specific *benefit* is perceived *for citizens* who will be able to use a new channel of communication and interaction with their municipality. However, some interviewees also note that there is a considerable lack of knowledge on what the *citizen demand*. A similar pattern can be observed regarding government employees. Some *employee* groups see a clear *benefit* in the use mobile technologies in their daily work routines while others fail to adopt these due to their *technological attitude*.

Consequently, the most important strategies to ensure a later user acceptance are to *involve citizens* at an early state and to focus consequently on the target group during the implementation of a new service (*user orientation*). Training the employees (*employee qualification*) however, has only been mentioned few times. Regarding the

business target group, there seems to be a slightly different relationship. In case local businesses see a clear benefit for a certain service, e.g. for mobile billing or parking, they will immediately utter such demand, so that *business benefits and demand* represent both an (even though weak) driver.

14.4.2.2. Economic Level Not surprising, all interviewees put large emphasis on economic aspects, so that we applied a semantically rather fine-grained code set at this level. In the first place, possible *process improvements*, e.g. by increasing level of information and throughput times, are mentioned to be a key driver for m-government. Such improvements may further lead to improved *cost-effectiveness* and *potential savings*. However, as some interviewees comment, not all process improvements pay off on the budget side, as freed resources are often immediately consumed by other tasks or an increased demand in the new service.

Surprisingly, *availability of funding* is only a light inhibitor for the municipalities. The rationale behind this is that a good application will automatically pay off, so that costs are to be seen as an investment rather than expenses. Therefore, *financial risks* play a stronger yet not very prominent role as an inhibitor in such investments. Strategies to ensure the economic success of such project are access to *supra-regional funding* (e.g., on federal or EU level) and a focus on *financial sustainability* on the whole.

14.4.2.3. Government Level On governmental level we find strong drivers as well as strong inhibitors. Few interviewees quote a certain *strategic intent*, i.e. a strategic vision and creativity of the municipality in the use of new technology, as well as the *capabilities of their team* (though to a smaller extent) as important drivers. But rather than relying only on their internal capabilities, most municipalities strongly refer to their network of *intercommunal cooperation* to share experiences and drive diffusion. Such networks can be formed by clusters of cities as well as cooperations of public service providers.

Political influence seems to be a double-edged sword. On the one hand, political bodies need to be arduously convinced (*internal marketing*) to commit to technologically enabled changes. On the other hand the interviewees report that larger transformations can much easier e implemented once there is a political will. However, if such political will is not present (which is mostly the case), the *ability to change* within the municipal administration can become a major inhibitor. Furthermore, *legal conditions* concerning data security, laws, as well as different legal standards between authorities and federal states are an issue. This obstacle, in some cases had, in other cases still may to be overcome by appropriate *regulatory changes*.

14.4.2.4. Technological Level Regulatory changes are also related to technological influences, especially *security and privacy* standards that municipalities need to comply with. However, stronger inhibitors on technological side refer to the *feasibility* to implement new technical solutions and *dependency on the market*. Deciding for a certain technology may lead to a lock-in to certain vendors. The

ability to integrate mobile applications with existing procedures also fails due to a lack of open standards (e.g., web services) in existing applications.

Several municipalities address feasibility issues through strategies of *cooperation with industrial partners* or *research institutions* to stay informed about the state-of-the-art. To minimize technological risks, also a *coexistence* of the mobile process with the legacy system is proposed. Yet, this strategy generates additional costs. Finally, some IT leaders mention the need to *structurally change* the IT landscape in order to be able to integrate with mobile channels.

Table 14.1: Service outcomes (by status and target group).

	Planned	**Implemented**	**Failed**
Citizens/ businesses (G2C/G2B)	• Mobile city portal (2) • Mobile library services (2) • Mobile tourist guide (1) • Problem reporting service (1) • Mobile payment platform (1)	• Mobile city portal (4) • Single service number (4) • Mobile parking tickets (2) • Public transportation information (1) • Public transportation payment (1) • Parking information service (1) • Appointment service (1)	• Live townhall meetings (1) • City Wi-Fi services (1) • Car sharing service (1)
Government-internal (G2G)	• Traffic warden support (3) • City council support system (2) • Civil engineering support (1) • Public order office support (1) • Retirement homes control (1) • Environment agency support (1)	• Traffic warden support (2) • Food inspection support (2) • City council support system (1) • Veterinary services support (1) • Firefighter support (1) • Mobile radar equipment (1)	

14.4.3. Consequences

We divided the consequences of M-Government adoption into *service outcomes* and *general outcomes*. Concerning the latter, most IT decision makers generally see a high *potential* in m-government possibilities and expect an increasing relevance of this topic in the next two to three years. However, the *perceived adoption* status differs. While some municipal representatives admit not having ventured any project with respect to mobile government, others consider themselves to have a stronger expertise and experience.

We found these perceptions generally reflected in the number of service outcomes observed which refer to the concrete mobile services which have been *planned*, *implemented,* or *failed*. Service outcomes are presented in Table 14.1. Here, the numbers in brackets correspond to the number of municipalities in the sample ($n = 12$). We acknowledge that these numbers serve as a rough indicator as interviewees might forget to mention a certain service during an interview. We find that there are some common (planned or implemented) applications across cities, e.g. the implementation of mobile city portals, traffic warden support, single service number,[1] and mobile parking tickets. Other services, by contrast, seem to be piloted largely on the initiative of individual cities.

14.5. Case Studies

To better understand the differences between municipalities we use the presented framework to conduct multiple case studies. The case findings are summarized by the overview in Table 14.2.

14.5.1. Case A: An M-Government Innovator

Case A is a city with more than 500,000 inhabitants in one of the economic centers in Germany and considers itself to be a leader in e- and m-government. The IT department is subordinate to the general office for central services and can be divided into two subunits: the department for IT operations and the office for organization and IT steering. Further, in course of the EU services directive,[2] e-government has been given a high priority through establishing an additional interdisciplinary Competence Centre within the Department for Economic Development.

1. Single service number (D115) represents an exception in as much as it follows a federal initiative of the Ministry of the Interior and is gradually rolled out nationwide. Also, the classification of this service as M-Government may be argued.

2. The EU *directive on services in the internal market* (2006/123/EC) has been issued with the objective of establishing a single market, and amongst other requires governments to provide a "point of single contact" via electronic means.

Table 14.2: Mobile government cases (overview).

	Case A Innovator	Case B IT experienced	Case C Efficiency-oriented	Case D Laggard
Municipality				
Size[a]	Very large	Medium	Medium	Very large
Budget & empl.[b]	2,500 mn Eur; 9,000 empl.	500 mn Eur; 4,000 empl.	300 mn Eur; 1,000 empl.	2,500 mn Eur; 9,000 empl.
Financial situation	Moderate	Moderate–poor	Poor	Moderate
Debt per capita[b]	200 Eur	900 Eur	1,200 Eur	1,600 Eur
IT organization				
Budget & empl.[b]	20 mn Eur; 300 empl.	6 mn Eur; 60 empl.	6 mn Eur; 8 empl.	10 mn Eur; 250 empl.
Horizontal distr.	Centralized	Centralized	Centralized	Decentralized
Governance mechanisms	Major decision rights on IT steering side	IT Steering Meeting	Idea Mgmt process IT steering decisions	IT Steering Meeting IT planning group
			Very high	Very Low
Sourcing degree	High	Medium		
User level	++ + Citizen demand + Business demand + City attractiveness	+ + Business benefits − Lack of knowledge on citizen demand	+ + Business demand ○ Citizen demand	○ + Ideas from departments ○ Citizen demand
Economic level	+ + Effort-reduct. for citizen + Process improvements + Long-term benefits	++ + Cost-effectiveness + Co-financing from supra-regional level	++ + Process improvements + Cost savings ○ Financial risks	○ + Goal to save costs − Ability to save costs

Governmental level	+	+	○	–
	+ Internal IT capabilities – Legal barriers ○ Resistance to change	+ Internal IT capabilities + Political influence – Legal barriers	○ Political influence	– Lack of alignment – Internal resistance – Political instability
Technological level	–	○	○	○
	+ Nation-wide standards – Integration ability	+ Market solutions – Authentication	○ Security and privacy – Technical coexistence	– Operational problems
Service outcomes				
Planned	○ Library services ○ Problem reporting ○ Elderly homes control ○ Environmental inspect	○ City portal ○ Payment platform ○ Library services ○ Tourist guide	○ Councilor support	n/a
Implemented	○ City portal ○ Appointment service ○ Parking information ○ Food inspection	○ Parking information	○ Traffic wardens ○ Food and veterinary inspection	○ City portal ○ Radar control ○ Parking payment
Failed	n/a	n/a	○ Live town hall meetings	n/a
General outcomes	Currently: information provision, future: more transactional services	Bring online services to mobile devices	Few focused applications with clear benefit	Arbitrary applications, less focus on efficiency

Note: empl., employees; distr., distribution; Eur, Euros.
[a]City size according to population (medium 100–250,000 and very large > 500,000 inhabitants).
[b]Figures rounded for reasons of anonymity.

The interface to the departmental areas is provided by a decentralized liaison role. Initiatives for new IT projects, such as mobile services, may be filed by the departmental areas and evaluated by central IT steering, which governs the IT budget. The city has outsourced data centre operations, networks and communication infrastructure and large parts of application management to a communal IT service provider.

The Head of Organization and IT steering sees the main benefit of mobile services particularly on citizen and internal side. Mobile applications, such as an appointment service or the ex-ante completion of required forms, may reduce citizens' attendance at public bodies, but also efforts for the municipality.

This tendency is seen as an important building block for increasing city attractiveness embedded in a comprehensive strategy of urban development. Same applies to local businesses, where the facilitation of routine interactions with the municipality may become an "absolute location factor." Economically, such applications should account for their costs, however, some applications which focus more on quality usually pay off only in the long run. Thus, almost everything which is technically feasible will be evaluated in the light of the IT strategy and municipal goals. Possible internal resistance to changes can widely be mitigated through the central empowerment of the office for organization and IT steering within the municipality administration.

The only restrictions from this perspective are technical possibilities and certain legal regulations, such as data protections laws. On the technical side, the interviewee states that most internal procedures and applications—contrary to a service-oriented paradigm—yet do not offer the possibility to be opened toward the (mobile) internet. Thus, on both issues more nationwide standards, as occurred for example with the introduction of the electronic ID,[3] would be appreciated to avoid redundancy. The municipality actively cooperates with industry, such as a local telecommunication company, as well as with local research institutions. As an outcome, the city offers and operates a number of external and internal mobile services, which enjoy a high acceptance among their users (see Table 14.3).

14.5.2. Case B: An IT Experienced Municipality

As case B, we chose a medium-sized city in Southern Germany with a structurally challenging but relatively dynamic economic environment. Our interviewee is the head of an e-government staff function, which has been installed to coordinate between the municipal demands, internal IT and a communal IT services provider. Like in case A, the link to the departmental areas is provided by IT liaison roles that

3. Germany has launched a new electronic ID from November 2010 onwards, driven by an initiative of the German Ministry of Interior, the Federal Office for Information Security and multiple research and industry partners.

manage day-to-day operations. On the strategic level, there is an IT steering committee meeting every 4–6 weeks and comprising members from the departmental areas, staff council, auditing, and internal IT. This committee decides on new and ongoing IT projects and only needs the city council's approval beyond a certain investment volume.

The main driver for m-government is seen in the benefit for local industries. They deservedly claim appropriate interfaces to simplify their own processes, e.g. for switching from a single to a collective billing. On the contrary, the interaction with citizens is characterized by consumption and creation of a benefit that is "hardly quantifiable." Moreover, the interviewee reports on difficulties in recognizing the citizen demand, as the demands of single interest groups cannot necessarily be understood as a collective need. On the economic level, the importance of a payment platform is stressed, hence only such services will be implemented which directly pay off, e.g. an on-demand provision of geo-data. However, implementing projects just for the sake of the city's image "was something for the 1990s," rather the city puts emphasis on the sustainability of the solution and pursues long-term partnerships with various industry partners.

On the governmental level we find interplay of sound internal IT capabilities and financing. Similar to case A, the interviewee also cites regulatory challenges on the distribution of competences between different bodies, as well as data protection laws as significant constraints. As a result, despite being very active in the e-government area, the municipality has realized few mobile solutions, yet is planning to expand in this field (see Table 14.3).

14.5.3. Case C: An Efficiency-Oriented Municipality

Case C is one of many German municipalities that must manage their resources in accordance with a budget-balancing concept.[4] IT operations have entirely been outsourced to a shared communal service provider. Similar to case A, the CIO and his staff, who are in charge of IT steering, are subordinate to the central office for personnel administration and organization. The municipality has established an internal idea management process, where employees from all kinds of departments may hand in ideas which are subsequently evaluated by the CIO and the central office.

The CIO considers m-government as an important topic. In course of cost savings and budget cuts, the administration is permanently forced to check for feasible alternatives. This mainly refers to the internal side (G2G), as such closed user groups mitigate the investment risk. Despite the growing popularity of internet connected

4. The German Local Government Code provides that municipalities must manage their resources in accordance with a budget-balancing concept (Haushaltssicherungskonzept), in case expenditures exceed income in the municipal cameralistics. Such municipalities no longer have the freedom to decide whether certain voluntary tasks should be pursued.

devices, he sees less potential on the citizen side, as there seems to be only "a hand full of younger citizens" that would use m-government services and those are harder to influence as a target group.

On the governmental level, stakeholders are partly affine, partly averse, leaving it to IT to assure, that estimated costs-benefits are kept. A major concern on the technological level is, that a redundancy of m-government with traditional e-government channels, e.g. for mobile ticketing, will generally lead to higher costs. As an outcome, three of the four ideas for m-government improvements have successfully been implemented, two of which are internal applications (see Table 14.2). The fourth, a live internet transmission of town-hall meetings, has been dismissed due to an uncertain citizen demand.

14.5.4. Case D: An M-Government Laggard

Size and financial situation case D municipality are comparable to case A. Despite a considerable debt level, the municipality benefits from a relatively strong economic environment and corresponding tax incomes. Over the past years, the IT organization has undergone several changes. The current setup is comparably fragmented with more than half of the 250 IT employees being located in the main departmental areas. Central ICT is operating infrastructure, telecommunications, and networks as well as the city website, and moreover generates business with external clients. There are two main governance bodies for IT decisions: IT steering meeting and IT planning group. The first comprises the IT heads of each IT department and meets one to five times a year to inform about new IT projects. Yet, a joint decision-making is only required only for large volume projects. IT planning group consists of two department managers from central IT and two from the office for personnel administration and organization. They jointly decide on technological and organizational guidelines of the municipality.

Central IT seems to have limited insight into user level drivers for m-government. According to the department head, there are hardly any requests to central ICT to offer any new services due to the decentralized structure. With the exception of the mobile city portal, all existing initiatives and realized applications stem from the solo efforts by departmental IT units, e.g. a parking payment application realized by the municipal traffic department. In some cases IT steering meeting was not sufficiently able to create alignment on such developments. This fact may even have induced operational problems, such as bandwidth problems and missing infrastructure support, when involving central ICT at a very late stage.

On an economic level, the objective of achieving cost savings is perceived strongly. However, central ICT as well as IT planning group largely fail to lever efficiency improvements due to a lack of empowerment and internal resistance, especially when processes and resources are concerned. The main strategy to overcome such resistance is seen in taking an indirect way via the political level. For this reason, currently a strategic paper including e- and m-government elements is being elaborated. Once the political level adopts an idea, there may be a stronger

momentum for renovation of the service landscape. However, the current outcome concerning mobile services (Table 14.3) is rather seen as the result of the departmental initiatives than of an overall strategy and efficiency goals.

14.5.5. Case Comparison: Contingencies for M-Government Adoption

Regarding the service outcomes, we argue that municipality A has the strongest, cases B and C medium, and case D the lowest *adoption* of m-government services, which is in line with the quantitative findings provided in (Winkler & Ernst, 2011). Further, exploring the *target groups* (citizens, business, and government employees) we find that municipality A is focusing on all three of them, while B explicitly excludes citizens due to a perceived lack of demand from this user group. Municipality C is even more restrictive and relates m-government primarily to "closed" user groups, i.e. internal staff. For municipality D, no clear user focus could be recognized.

As a municipality context we explored size, economic profile and budgetary situation. Concerning *size* we selected two comparable cases each for mid-sized (B, C) and very large (A, D) cities. Based on the presented cases, we conclude that there is no support for a coercive correlation between the size of a municipality and the adoption of mobile services. In respect to the *financial situation* (economic profile and budgetary situation), we find more gradual differences between the four cases. Cases A and D exhibit a comparably good, case B a moderate-poor and case C a poor financial situation. We consider this fact to be an indicator of a relationship between the financial situation of a municipality and the outcomes of m-government adoption for cases A, B, and C. However, for case D there seem to be further organizational contingencies.

Properties of the IT organization refer to horizontal distribution, governance mechanisms and sourcing degree. Regarding horizontal distribution and sourcing degree, we find considerable differences between cases A, B, C on the one hand, and D on the other. We argue that from a resource-based perspective the central ICT

Table 14.3: Findings: Contingencies for m-government adoption and target groups.

		IT governance	
		Transformational	**Nontransformational**
Financial situation	Strong	Target groups: G2C, G2B, and G2G (Case A: Innovator)	Unfocused adoption (Case D: Laggard)
	Moderate	Target groups: G2B and G2G (Case B: IT experienced)	
	Poor	Target group: G2G (Case C: Efficiency-oriented)	

department in the case D takes a similar role as the communal IT services providers in cases A, B, and C. Thus, we do not immediately account the highly decentralized horizontal distribution and a low-sourcing degree in case D for differences in M-Government adoption. Instead we draw on IT governance theory and deduce that case D exhibits a somewhat unbalanced allocation of decisions rights between centralized and decentralized IT departments (Weill & Ross, 2004). Although municipality D has certain governance mechanisms in place, such as decision committees and an investment approval process, these practices do not work effectively. Thus, decisions which enhance the efficient use of e- and m-government technology encounter comparably large internal resistance. Moreover, unlike in cases A, B, and C, the responsibilities for IT and organizational issues are organizationally separated, so that central ICT is not given sufficient *decision rights to promote changes of a transformational kind*, which among other effects, also inhibits m-government adoption. Concluding, we propose a new dimension for the *IT governance* property which will tell us, whether IT is equipped with such transformational decision rights or not (nontransformational). The resulting contingencies are summarized in Table 14.3.

14.6. Conclusion

This work used a multimethod qualitative approach to explore the factors that influence public sector institutions in the adoption of mobile government services. We condensed these factors in a novel and empirically well grounded framework and demonstrated how to apply such framework in four case examples.

14.6.1. Findings and Contribution

Our findings suggest that process improvements and expected citizen benefits are among the strongest and most quoted drivers for m-government while the ability of the administration to change as well as technical integratability represent some of the strongest inhibitors. Furthermore, municipalities choose strategies such as inter-communal cooperation and increased citizen involvement to foster innovation diffusion and adequately address their target groups. The framework developed (Figure 14.3) may serve as an orientation for practitioners and academics who wish to better understand the set of factors that are critical in m-government adoption.

The framework is generally in line with the burgeoning literature on m-government; however, it throws a new light on the graduation between the factors, which have traditionally focused more on issues of privacy and security as well as accessibility. Privacy, security, and the pertinent legislation still remains an important issue for local administrations, yet with less perceived impact on m-government adoption than literature suggests. The latter, accessibility, did not emerge as a major factor from our analysis. This reflects that the attention of local governments meanwhile has shifted

from infrastructure to user-related issues so that municipalities today approach m-government with increased determination.

Examining the differences between those municipalities that lead the way and others that follow in m-government diffusion, the results of the case comparison provide support for the contingent influence of the contextual variables *financial situation* and *IT governance*. Building on these findings, we argue that municipalities with an economically challenging environment should first focus on internal m-government applications, while those with a comparably good financial situation may have the freedom to exploit the full range of citizen-, business-, and employee-oriented m-government applications.

To underline our findings regarding the second contextual variable, we introduced the concept of *transformational IT governance*. This concept helps us to demonstrate that only those public sector agencies will succeed in transformational projects such as m-government that are able to effectively connect responsibilities for IT and organization so that transformational changes can be managed and resistance be mitigated. We hereby enrich literature by a currently underrepresented, but important strategic aspect in e-government research and provide appropriate mid-range theory for m-government adoption on municipal level.

14.6.2. Limitations and Future Work

This work has some limitations which should be considered when interpreting the findings. First, due to the sample size of 12 municipalities, the theory developed may possess limited generalizability or leave out further important facets of m-government adoption. Second, the legal framework as well as the culture in Germany may be different from other countries which may limit the applicability to other national contexts. Finally, the voluntary participation in interviews may lead to a nonresponse bias of the interview data. However, these limitations are inherent to the qualitative approach, since for case study research a statistical sampling is generally not required (Merriam, 1998). In our future work, we aim to validate the proposed theory in larger, confirmatory studies and investigate m-government adoption across different national contexts.

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