

Barriers and impediments to transformational government: insights from literature and practice

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Abstract: Information and communication technology (ICT) has the potential to transform the public sector. Recently, transformational government (t-government) has been introduced as a new stage of e-government aimed at realizing structural changes and greater benefits. Yet, there are many impediments blocking transformation and there is limited insight in these barriers. In this paper impediments for t-government are investigated by conducting a literature review and using this to investigate three case studies. The impediments found in literature primarily originate from literature not focusing on the transformational stage of e-government. These barriers were confirmed and extended using the case studies. Impediments simultaneously occur on the governance, the organisational and managerial, and the technical level. Impediments represent an interrelated set of factors that need to be addressed in concert. Research on transformation can benefit from studying, understanding and dealing with these interrelated impediments.

Keywords: e-government; t-government; transformation; impediments; barriers; process re-engineering.

1 Introduction

Information and communication technology (ICT) has been hailed for its capability to improve the public sector (e.g. Laye and Lee, 2001; Gupta and Jana, 2003). Against this backdrop, the concept of electronic government (e-government) was introduced in many countries around the world in the mid/late 1990s (Weerakkody, Janssen and Dwivedi, 2009). Many e-government initiatives and e-government development models focus

foremost on improving (online) service delivery (e.g. Gupta and Jana, 2003; Layne and Lee, 2001). After the first stages of information provisioning and simple online transactions have been achieved, governments start to undertake integration efforts that will make governments more joined-up, demand-driven and pro-active towards citizens and businesses (Peristeras and Tarabanis, 2000; West, 2004). However, many of these initiatives did not result in real transformation and only existing practices are digitized. Literature, therefore, suggests that real transformation has not yet taken place (Coursey and Norris, 2008; Kraemer and King, 2005). Instead, ICT is overlaid onto existing organisational structures and processes without any consideration of how it can be leveraged to improve government operations. This amounts to merely using technology for doing things more efficiently without accomplishing any fundamental change.

Although the claim that e-government will transform the public sector altogether was made before (see, for instance, Baum, Di Maio and Caldwell, 2000), the emphasis on the transformative character of e-government recently gained more attention (e.g. Dhillon, Weerakkody and Dwivedi, 2008; Gascó, 2003; Irani, Elliman and Jackson, 2007; Moon, 2002; Scholl, 2005; West, 2004). The basic idea of transformational government (t-government) is to realize large changes in public sector practices and structures that cannot be easily undone. T-government can be seen as a specific strand or stage of e-government aiming at generating greater benefits from e-government (Irani, Elliman and Jackson, 2007). Extensive organisational change is considered necessary to leverage the benefits of ICT (Gregor, Martin and Fernandez et al., 2006) and different departments and organisations need to cooperate and integrate their activities (Dhillon, Weerakkody and Dwivedi, 2008; Layne and Lee, 2001). In addition, it is argued that an extensive process of business process change or business process re-engineering (BPR) will need to take place before transformation can be realised (Dhillon, Weerakkody and Dwivedi, 2008; Scholl, 2005). Generally, when transformation has taken place, the new situation is qualitatively different than before (Tosey and Robinson, 2002). Besides better service delivery, other objectives associated with t-government are more transparent and responsive government and greater efficiency (Gascó, 2003; Kraemer and King, 2005), as well as improved accountability of government by opening-up information, e-participation of citizens in policy making processes, and increased democratic responsiveness and leadership accountability (West, 2004; West, 2005; UNPAN, 2008).

While some studies identify transformational efforts being undertaken by governments on all levels (Dhillon, Weerakkody and Dwivedi, 2008; Moon, 2002; Scholl, 2005), other studies point out that there is a lack of empirical evidence that real public sector transformation has taken place (Coursey and Norris, 2008; Kraemer and King, 2005; West, 2004). There are many impediments that complicate real transformation. Despite the importance to understand these impediments there is limited research in this area. This paper aims to bridge this knowledge gap by exploring impediments that organisations encounter while undertaking t-government efforts. Based on literature impediments are categorised and three case studies are investigated using this categorisation. In the next section we start with creating an overview of e-government impediments by investigating literature. In the sections thereafter, we describe our research approach and present three case studies to find impediments for the transformational stage of e-government. In section five we will use the findings of the

case studies to expand the list of impediments followed by a discussion in section six. Finally, conclusions and recommendations for further research are presented.

2 Impediments to t-government from literature

The improved services ideal of e-government consists of a number of interrelated trends: citizens and businesses will only need to provide their information once to any government agency involved in a service, they will get personalised services, and single contact points in the form of designated websites that function as the unique information- and service access points for all government agencies are set up: the ‘one-stop-shops’ (Wimmer, 2002). More recently, objectives such as increased transparency, accountability and responsiveness (West, 2005; UNPAN, 2008) have been added to this ideal. T-government requires organisations to collaborate, which requires organisational changes to take place not only in the service delivering front office, but also in the back offices of organisations. More collaboration between multiple autonomous organisations will lead to the transformation from a siloed structure of government to performing tasks as part of chains or networks (Bannister, 2001; Castells, 2000; Ho, 2002).

Research on public sector change and the implementation of information systems in (government) organisations, often focuses on critical success factors (CSF) (e.g. Akkermans and Van Helden, 2002; Poon and Wagner, 2001; Rosacker and Olson, 2008; Somers and Nelson, 2001; Shareef, Kumar and Kumar, 2009, Sagheb-Tehrani, 2010). Although in literature impediments are sporadically mentioned, hardly any research can be found that is focused on systematically identifying and categorizing impeding factors. Nevertheless, understanding these barriers is important in order to be able to deal with them in undertaking transformational efforts. Success factors and impediments are closely related to each other and, therefore, we categorise the impediments into three groups used in CSF research: governance (including political and legal), organisational and managerial, and technological factors (Gil-Garcia and Pardo, 2005).

Governance impediments are identified by Liu and Hwang (2003), who consider insufficient IT governance by the central government to be the main impeding factor of t-government. The importance of political, legal and governance aspects in the public sector are also emphasised by Fountain (2001) and Gascó (2003) who point out the institutional factors that present limitations to changing the public sector. Furthermore, another impeding factor identified is the division of costs (Ebrahim and Irani, 2005; Janssen and Cresswell, 2005). Among those factors that make up the category of *organisational and managerial* impediments are the lack of IT skills and personnel (Ebrahim and Irani, 2005) and the lack of coordination between departments (Ebrahim and Irani, 2005; Janssen and Cresswell, 2005). Furthermore, also adoption of a project management approach and lack of implementation guidelines are considered impediments (Gil-Garcia, Chengalur-Smith and Duchessi, 2007). *Technological factors* that are mentioned in literature as barriers to these transformational efforts include system complexity and incompatibility (Gil-Garcia, Chengalur-Smith and Duchessi, 2007) as well as the lack of an enterprise architecture (EA) (Janssen and van Veenstra, 2005; Kamal, Weerakkody and Jones, 2009), standards and interoperable systems (Ebrahim and

Irani, 2005). Furthermore, also security threats are identified as impediments (Ebrahim and Irani, 2005).

The key categories of impediments found in e-government literature are summarised in Table 1. Most of the literature included in this table does not focus on transformational stage of e-government. Thus, there is hardly any insight in which impediments are of specific importance for the transformational stage of e-government. In addition, only a limited number of impediments is based on empirical evidence.

Table 1. Overview of key categories of impediments

Category	Impediment	Literature Examples
<i>Governance</i>	Division of costs Insufficient IT governance Structure of the public sector Public sector culture Political pressure (or lack thereof)	Ebrahim and Irani (2005); Janssen and Cresswell (2005) Liu and Hwang (2003) Fountain (2001); Beynon-Davies and Williams (2003); Gascó (2003); Janssen and Cresswell (2005) Weerakkody, Janssen and Dwivedi (2009) Fountain (2001)
<i>Organisational and managerial</i>	Lack of IT skills and personnel Lack of coordination and collaboration Lack of organisational readiness to business process re-engineering; bureaucratic business practices Fragmentation; siloed organisational structure	Ebrahim and Irani (2005); Lam (2005) Dhillon, Weerakkody and Dwivedi (2008); Ebrahim and Irani (2005) Scholl (2005); Dhillon, Weerakkody and Dwivedi (2008); Al-Shafi and Weerakkody (2007) Bannister (2001), Wimmer (2002); Janssen and Wagenaar (2006)
<i>Technical</i>	Complexity and incompatibility Security threats Lack of enterprise architecture and standards	Al-Mashari and Zairi (1999); Gil-Garcia, Chengalur-Smith, and Duchessi (2008) Ebrahim and Irani (2005) Janssen and Van Veenstra (2005); Kamal, Weerakkody and Jones (2009); Ebrahim and Irani (2005)

3 Research approach

In order to compare and extend the impediments found in literature with the impediments government agencies encounter in practice, this research used a qualitative research approach using semi-structured interviews to study multiple cases (Walsham, 1995; Yin,

1989). Case study research is a suitable instrument as there is limited knowledge about impediments in literature. Although we did find a large number of impediments of e-government in literature, we did not find any literature having the goal to determine impediments and barriers of t-government specifically. The aim of the case studies was to extend the impediments found in literature for the transformational stage of e-government. We used an interpretivist methodology for in-depth research of organisational case studies since this best fits the complexity of the matter (e.g. Klein and Myers, 1999; Walsham, 1995). As an approach of using a single case study is usually considered inferior to an approach using multiple cases (Yin, 1989), multiple case studies were carried out. Yin (1989) asserts that a small number of cases can already be successful, if selected with care.

Three case studies were selected based on their distinctive characteristics in service provisioning. All three case studies match the nature of t-government as they are aimed at realizing structural changes, process re-engineering, organisational change, systems integration, and they aim to realise better value for citizens and businesses by creating transparent, accountable, efficient and responsive government. To meet these objectives, the case studies deployed different approaches aimed at changing various parts of the organization. The first case undertook a radical front office transformation. The second case emphasised back office re-engineering and the formation of service delivery chains in a previously predominantly stove-piped organisation. Finally, the third case focused on the formation of a service delivery chain within a network in which multiple organisations collaborate to provide integrated services to their customers. By using these three case studies the various organisational parts (front office, back office and inter-organisational transformation) that can be transformed were covered, which should ensure that impediments are found in all these aspects.

The case studies were investigated by deploying a combination of research methods, including analysis of internal reports and memos, newspapers articles, and interviews. Based on content analysis of the reports and other documents an overview of the impediments encountered was created for each case study. Next, the impediments were verified and extended by interviewing three key people representing both line management and ICT staff. The first case study is an executive agency considered to be a best practice in multi-channel service delivery in the Netherlands. This case study was carried out by interviewing a manager, the programme manager responsible for multi-channel service delivery, and an information architect. The second case, a medium-sized municipality well-known for its innovative capabilities, was investigated by interviewing the programme manager responsible for online service provisioning, a project manager and an ICT specialist. Three interviews were also used to investigate the third case: the social security chain. The social security chain is one of the oldest and most far-reaching examples of joined-up government in the Netherlands. All interviews were held over a prolonged period of time between 2007 and 2009 and lasted between forty and ninety minutes.

4 Case studies

To explore the impediments encountered, first the transformational efforts that were undertaken in each of the three case studies are described over time. Then, impediments and barriers to transform are identified for each of the three categories of Table 1.

4.1 Executive agency

The first case we discuss is a large semi-autonomous executive agency responsible for millions of interactions with its clients every year. The organisation undertook extensive front office transformation as it aimed to achieve customer-oriented service delivery as well as increased efficiency in its interactions with its clients. Furthermore, to allow for the coordination of its multiple service channels and their corresponding departments, a single department was set up. Creating a department specialized in a multi-channel approach to service delivery ensured that a state-of-the-art front office was developed. As the front office was the main focus of the transformation effort, the organisation primarily achieved results in the area of service delivery. Both improved service delivery and increased efficiency in its activities related to customer interactions were achieved. However, the back office applications and processes could not keep up with this transformation. Various attempts have been undertaken to re-engineer the legacy back office systems, but these attempts failed. We explored the impediments that this organisation encountered in their transformational efforts.

Impediments to transformation

During the process of transformation, the organisation found out that its current siloed organisational structure was not suitable for achieving its objectives. Without back office re-engineering, the long-term impact of the efforts are marginal. Although the enhanced front office structure proved to be very successful for managing the various channels of customer contacts, it did not succeed in facilitating the transformation of the organisation as a whole. Behind the state-of-the-art front end, back office processes and applications could not keep up with the improved service provisioning and continued to operate in a siloed way. One of the interviewees pointed out: “*you can build a fancy front office, but if the back office lags behind this is of no use. The back office needs to be re-organised to accomplish the front office’s goals*”. Following a trial-and-error approach, transformational efforts were based on current organisational structure and the desire to improve efficiency and customer satisfaction. Therefore, the transformation efforts reinforced the existing work processes within the organisation. There was no vision on what a transformed organisation should look like, which was found to be the largest barrier on the *governance* level.

On the *organisational and managerial* level, the programme manager responsible for multi-channel service delivery acknowledged that information technology does not solve all service related problems, but it needs to be accompanied with changes in the organisational structure, as well as in the roles, responsibilities and culture of employees. In this case, however, a main impediment to transformation was that the back office lags behind the front office re-design. While there is an architecture designed to guide the back office transformation, the ICT department is seen as a unit that serves the business units upon their requests. These requests are often granted if budget is made available by

the business unit. Furthermore, political issues sometimes surpass the priority of developing systems under architecture. If processes and information sharing within the organisation as well as between the organisation and other (government) agencies can be re-designed, transparency and public accountability can be improved.

On the *technological* level, the formation of chains was hindered by legacy in the back office. Multiple attempts to re-engineer the major back office system (which is over twenty years old) failed. As the development of a new back office system is a complex undertaking, the memory of a recent failure needs to have faded before a new attempt can be made, one of our interviewees told us. Therefore, recent changes have led to an uneven development of the organisation. In some service delivery chains, collaboration with other organisations is improving, including increased information exchange, greater interoperability of information systems and a clearer allocation of responsibilities. Current efforts are leading to automated exchange of information (via web services) with other parties. Still, privacy and security concerns are often primarily dealt with in the legal arena, without any technological solutions being addressed. From a technological perspective, the architecture provides an overarching picture for adaptation of the infrastructure. However, while this architecture is used in stable times, *“in politically turbulent times, the architecture is often surpassed”*, an architect told us.

4.2 Municipality

The municipality under study is often considered to be a good practice in the Netherlands for its effort to transform into a demand-driven organisation. Early 2000, the city council of the municipality decided that it wanted to become a front-runner in the field of e-government. A four-year action plan was developed, which resulted in a high ranking in the national e-government benchmark. A second transformational effort was undertaken after it became clear that to achieve real demand-driven service delivery, back office transformation was also necessary. As part of these efforts a broker was developed that connected the various systems in the front and back office with each other. Efforts of this municipality only succeeded partially as the organisation was re-organised and the technology necessary to achieve its objectives was put in place, but it subsequently failed to align this technology to its business processes. Thus, the main drivers of the two-step transformation process are a focus on service-orientation, and technology-driven intra-organisational re-engineering.

Impediments to transformation

The municipality transformed into a service-oriented organisation and extended the service delivery chains to its back office. However, the interviewees explained that responsibilities are not divided clearly between the steps in the business processes. Therefore, currently efforts are undertaken to re-engineer the business processes in order to create more clarity about where activities and tasks should be performed. The municipality failed to align its systems to its business processes, which proved to be the bottle neck for transformation. Currently, a number of business processes is analysed and mapped to the broker architecture and web site. One interviewee said that *“our experiences show that realising interoperability among systems is always more difficult*

than initially expected and often requires changes in other fields such as organisation and business processes". The automation of all business processes is a long-term process, as it requires extensive analysis of current processes, its corresponding structures and future possibilities. Furthermore, connections with other organisations are limited; only connections based on well-standardised formats are realised. Impediments were found on all three layers. On the *governance* level the main impediment is the lack of knowledge on how changes impacted the organisation, its processes and the technology.

On the *organisational and managerial* level this lack of vision was also found, as the organisation was not ready for the implementation of demand-driven service provisioning yet. Alteration of the organisational structure was not planned and technology implementation actually reinforced the existing structure. In a subsequent action plan, the organisation tried to tackle these issues by transforming the organisation from a siloed structure to a process-oriented organisation. Still, the impact of these changes on the organisational structure and culture, business processes, and technology was underestimated. Whereas architects were in charge of the front office design, no architects were involved in designing the back office, which was completely left to software vendors.

At the *technological* layer the low level of interoperability due to limited availability of standards and closed applications was viewed as the main impediment. The broker relies on interactions with applications that in turn need to be able to process information to and from the broker. A related topic is the reliance on software vendors, which results in purchasing off-the-shelf products that are sometimes modified to fit the specific organisation. Municipalities often possess insufficient knowledge to develop their own systems and software vendors may not adhere to standards or not open up their applications for interaction with other systems.

4.3 Social security chain

The third case study concerns the formation of the social security chain, in which a network was formed around the cross-organisational processes of social security issuance and reintegration of the unemployed. In this network, the national social security agency, the national employment agency and municipalities collaborate. Although this has led to the merger of the former two organizations, initially, the formation of the network was a cumbersome process and integration only succeeded after a number of agreements was made regarding the technical architecture, the message structures and the implementation of the system. To facilitate and monitor the exchange of information within the network a central organisation was set up that maintains an information system that supports the information exchange necessary for achieving the cross-organisational processes. Involvement of local governments ensures close collaboration with customers.

Impediments to transformation

In this transformation to a network of public service delivery, a major tension was present between the autonomy of the organisations involved and the degree to which cooperation in this network impacted the work practices of these organisations. This was also reflected in the merger of two previously independent organisations that allow for more

control of the work processes. Furthermore, the distribution of costs became a major issue, which was solved in the past by the provisioning of funding by the central government for making the necessary changes. Although this configuration allows the different organisations to remain largely autonomous in their operational activities, the system requires a lot of maintenance and technological changes can only be implemented after an extensive negotiation process involving all agencies.

On the *organisational and managerial* level, one of the main barriers is the fragmented nature of government, with all organisations having their own responsibilities within the same domain. Because of the strict rules that apply to the business process, all organisations needed to adapt their own processes to that of the network. Furthermore, any changes in the organisational network require the involvement of multiple organisations that may resist change and the division of the costs of the changes over the organisations proved to be a major issue. Another issue was the redistribution of responsibilities between those organisations. As the national employment agency took over some of the tasks of the other two parties, a situation emerged in which these two parties were initially dissatisfied. One interviewee explained: “*By taking over some of the tasks from other agencies, we were regarded with suspicion as they believed that we would never do their job the way they did it themselves*”. Another impediment was that the users of the system were not involved in the development, leading to a system that does not necessarily solve users’ problems.

The *technological* impediments identified were mainly related to the lack of standardisation of information systems and data formats, which made integration of systems and collaboration between organisations a difficult process requiring a long negotiation time. First a mandatory architecture had to be set up in which the information exchange processes have been detailed. This mandatory architecture contains business process rules which prescribe which organisation should receive or send information given a particular situation as well as the service levels setting the requirements for these interactions. This architecture evolved over a very long time and every time a change in process takes place, this architecture has to be re-negotiated. Although the system is robust and client-oriented, set-up and maintenance are cumbersome processes.

5 Findings: impediments to transformation

The three case studies show a variety of impediments to transformation in all three categories identified in literature. These barriers have been aggregated and structured in Table 3. The impediments identified in literature (as described in Table 1) are italicized and sometimes further specified to match the impediments found in the cases. They are categorized according to barrier category, according to the cases they apply to and according to whether they were found in the literature (“Lit.” column). In Table 3 is case 1 the executive agency, case 2 the municipality, and case 3 the social security network.

Table 3. Impediments to transformation

Categories	Impediments	Lit.	Case		
			1	2	3

Governance	<i>Division of costs</i> and funding arrangements	X			X
	<i>Insufficient IT governance</i>	X	X	X	X
	<i>Structure of the public sector</i> : fragmentation and autonomy of organisations	X	X	X	X
	<i>Political pressure (or lack thereof)</i>	X	X		
	<i>Public sector culture</i>	X	X	X	X
	Lack of communication and cooperation				X
	Limited prior experience in collaboration		X	X	X
Organisational and managerial	<i>Lack of IT skills and personnel</i>	X	X	X	X
	<i>Lack of coordination and collaboration</i>	X			X
	<i>Lack of organisational readiness to business process re-engineering</i>	X	X	X	X
	<i>Fragmentation; siloed organisational structure; bureaucratic business practices</i> and fragmented or ill-defined decision-making responsibility	X	X	X	X
	Unclear vision and realistic transformational objectives		X	X	X
	Absence of implementation guidance and best practices		X	X	X
	No relation between organization and information technology		X	X	X
	Insufficient understanding of clients (users)				X
	No detailed business process descriptions present			X	
Technological	<i>Security threats</i> and privacy concerns not addressed by technological solutions	X	X	X	
	<i>Lack of enterprise architecture and standards</i> for interoperability	X	X	X	X
	<i>Complexity and incompatibility</i> of (legacy) information systems	X	X	X	X
	Dependency on software vendors for system innovation			X	
	Lack of alignment of ICT to the organisation by process redesign		X	X	X
	Lack of development of basic infrastructural facilities		X	X	
	Memory of recent failures limits possibilities of new efforts to re-engineer legacy systems		X		

From Table 3 it becomes clear that the impediments found in e-government literature only represent part of the impediments encountered in t-government practice. In literature eleven types of impediments were found, which were all confirmed by our research. In addition, eleven new impediments were found in the case studies, representing a 100% increase. This shows that in current literature impediments have not been given the necessary attention.

The main impediments on the *governance* level suggest that the integration of services across the public sector requires a government-wide strategy and vision in order to develop the infrastructural facilities needed to accommodate organisations in chains and networks. Since this requires a fundamental overhaul of the public sector as a whole, individual organisations need to consider their position within this transformation and keep in mind the possibilities of integrating with other public agencies.

The impediments identified on the *organisational and managerial* level suggest that transformation requires a lot of efforts from all stakeholders involved. When

organisational change is undertaken, often a large number of stakeholders with complex and interdependent relationships is involved. Implementation of information systems is, therefore, a very complex undertaking requiring carefully crafted change strategies. To overcome a number of these barriers, change management tools should be taken into account to ensure even organisational development, alignment of information technology to the organisation and business process re-engineering.

On the *technological* level, barriers suggest that many organisations lack the knowledge to achieve the necessary innovations because they depend on legacy systems or on vendors to develop systems, as they often do not have the ability to develop all the necessary systems themselves. Furthermore, the lack of EA to guide the re-engineering and alignment of technologies and business processes and the lack of standards to ensure interoperability are other impediments.

A number of similarities between the impediments in the case studies can be observed. The Dutch public sector displays a large degree of fragmentation, which is reflected in most of the impediments observed on the governance level. Mechanisms to overcome this fragmentation – such as cross-organisational cooperation and collaborative decision making – are underdeveloped at this level. Furthermore, on the organisational and managerial level this fragmentation was also shown and change management strategies need to be developed in all cases. All organisations studied suffered from an asynchronous development of its organisation, most notably between their front office and back office. On the technical level, in all cases legacy systems hindered transformational efforts and a lack of alignment between information systems, business processes and organisation as well as a lack of standardisation and flexibility were observed.

6 Discussion

In e-government, including the transformational stage of e-government, no systematic and structured overview of barriers and impediments was available. Using literature we created an initial list of impediments and extended this list based on case study research. Table 1 shows that literature often focuses on one type of impediments and does not take the diversity of impediments into account. This shows that in current literature impediments have not been given the necessary attention. Nevertheless, they cannot be ignored as they need to be addressed to make the transformational stage of e-government successful.

In the case studies on t-government we found double the amount of barriers impeding e-government found in literature. This can be attributed to the fact that the investigated literature does not originate from the transformational stage of e-government, but is focused on the first stages of e-government instead. This suggests that the transformational stage of e-government may have other impediments than the initial stages. The case studies also show that impediments occur on all levels and are often interrelated. This suggests that focusing on a single impediment or even a single category of impediments might result in too narrow a focus. This is in contrast with the many

studies which focus only on a limited number of impediments. Thus, there is a need for taking a broader and more holistic approach to dealing with impediments.

Many of the impediments are related to each other and solving one may be a condition for dealing with the next. Some impediments such as interoperability must be solved before inter-organisational business processes can be created. Several of the impediments found can be considered general barriers to change within the public sector. Therefore, more insight into the interrelations among the barriers is necessary as well as a better understanding of which barriers are generic and which barriers are specific to t-government. Many of the impediments are unlikely to be unique and much can be learned from related research fields. Further research on t-government should have an interdisciplinary nature and look at research in related fields like governance, EA and change management.

The three case studies show that achieving t-government is a cumbersome process in which impediments on the governance, organisational and managerial, and on the technological level have to be overcome. Of the additional eleven barriers found in practice, five barriers played a role in all cases investigated. This suggests that some impediments may be applicable to the whole domain of t-government, whereas others are unique for a certain situations. This conclusion should be interpreted with care, as we conducted only a limited number of case studies and we did not aim to generalise.

In the case studies the transformational stage of e-government applied to the field of service provisioning is characterised by structural changes realised by business process re-engineering, changes in organisational structure, systems integration and by aiming for the realisation of better value for citizens and businesses by creating a transparent, accountable, efficient and responsive government. The confrontation between t-government literature and our case studies shows that most of the 'advanced' transformational objectives, such as increased transparency, responsiveness and participation, are on the agenda of these organisations, but are given limited attention in reality. Similar to Dhillon, Weerakkody and Dwivedi (2008) we found that although these subjects are part of the national e-government policies, individual government agencies are not ready to realise these transformational objectives yet. Instead, they are still struggling to re-engineer their business processes and their organisational structure accordingly. This suggests that certain changes need to be made before these aims can be realised. The capability and readiness of organisations to transform is limited and the case studies focused on realising structural changes and creating the conditions necessary for realising the transformational objectives.

While the cases studied are considered best practices in the Netherlands, they do not manage to move beyond the cumbersome process of service chain formation. The absence of a clear vision, too high an ambition, the absence of implementation guidance and the lack of a relation between organisational and technical elements, were impediments to transformation in practice, but were not found in the literature. Therefore, there is a need for methodologies and instruments dealing with these impediments. EA has been identified as a potential instrument in previous studies (Janssen and Veenstra, 2005; Kamal, Weerakkody and Jones, 2009). Architecture can be used as a change instrument to migrate from an 'as-is' to a 'to-be' situation. EA should also be part of a future line of inquiry into providing t-government guidance. The organisation must improve their systems to open up information to other organisations as well as to citizens

and businesses, if this is desired and align their organisational structures and business processes at the same time.

7 Conclusion

Government organisations aim to transform of their operations to create better value for their citizens. The transformational stage of e-government applied to service provisioning is characterised by business process re-engineering, organisational change and systems integration all aiming to realise better value through the creation of transparent, accountable, efficient and responsive government. Many impediments, however, complicate these t-government efforts. But our empirical findings suggest that in literature impediments have not been given the necessary attention as only half of the impediments found in practice were also found in literature. Of those additional barriers found in practice, five barriers played a role in all three cases investigated. The main impediments we observed are fragmentation of the public sector, an organisational culture that is resistant to change, lack of knowledge of how transformation can be achieved, lack of knowledge on business process re-engineering, and the lack of a shared infrastructure and standards.

The case studies, thus, show that t-government is a cumbersome process in which interrelated barriers have to be overcome. Impediments occur simultaneously on the governance, organisational and managerial, and the technological level. Much of the literature is focused on a limited number of impediments on one level. This suggests that there is a need for a holistic approach to dealing with barriers. However, impediments are hardly researched yet and t-government efforts encounter other types of barriers that the past e-government efforts that merely digitised existing processes. This implies that research on transformation can benefit from studying, understanding and dealing with impediments. Thus, future research should give more insight into these impediments and how they can be dealt with. Many of the impediments are unlikely to be unique for the public sector. Therefore, further research on t-government should take an interdisciplinary approach and look at research in related fields such as governance, architecture and change management.

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