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Governance Challenges of Inter-organizational Digital Public Services Provisioning: A Case Study on Digital Invoicing Services in Belgium

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Abstract. Governments aim to digitalize public services. Whereas initially they worked in isolation, nowadays they increasingly link different building blocks together to realize integrated public services. This evolution poses challenges concerning the governance of public services. The purpose of this paper is to identify governance challenges in inter-organizational digital public service delivery. To do this, we investigated a case study that deals with the creation of digital invoicing services in Belgium. The findings show seven groups of governance challenges that incorporate technical, organizational and inter-organizational factors. Governance challenges can be external, related to the environment and the users, as well as internal, related to the digitalization objectives and governance dynamics. Moreover, as public services evolve over time, so do governance challenges, suggesting that governance regimes may have to evolve accordingly to maintain coordinated service delivery.

Keywords: Public service delivery · E-government · Inter-organizational collaboration · Governance challenges

1 Introduction

Public administrations are continuously undertaking efforts to digitalize and integrate public services. Numerous factors drive these efforts, including technological innovations, changing user expectations, more holistic views on how services can be delivered to citizens, but also persisting goals to realize efficiency gains and increase service delivery effectiveness [5, 7]. Many administrations are, however, still characterized by fragmentation. This is due to specialization, the legal context and the impact of administrative reforms [22]. In such a context, integration efforts transform the delivery of public services from organizational boundaries or governmental 'silos' to complex inter-organizational networks [4, 7].

Inter-organizational services can be conceptualized as service delivery chains consisting of several building blocks [23]. Building blocks are managed separately or jointly by different public sector organizations. They provide functionality that can be reused

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across multiple integrated and inter-organizational services. Examples include platforms to allow the exchange of information and building blocks for identification and authentication services. In general, service provisioning within the larger digital government infrastructure can be characterized as modular [25] and consists of delivery chains of loosely-coupled building blocks. Such services deal with for example life events or procurement services.

Developing and maintaining integrated public services also faces multiple challenges [26]. This is related to many factors, including how administrations function, what skills and capabilities are necessary and how building blocks, services and organizations can be managed [1]. Governance is necessary to navigate those challenges [25].

In the context of integrated service delivery, Klievink and Janssen [23] identified several challenges that deal with interdependencies regarding the coordination of business processes, information, standards, (legacy) information systems and infrastructures within and across organizations. Yang and Maxwell [34] reported challenges relating to outsourcing, differing technological capabilities between involved organizations, and ensuring information security. Other challenges are related to developing flexible architectures, maintaining the goals and objectives of the particular digital public service [33] and understanding the various stakeholders in the public, private and non-profit sectors [2].

A specific challenge has to do with improving and retaining interoperability. Interoperability is the ability of disparate systems to exchange and use information in such a way that allows them to work together [29, 34]. On a technical level this relates to building a flexible infrastructure and connecting building blocks at a low cost to deliver new services [32]. On an organizational level this concerns the ability to share resources effectively across stakeholders [29]. According to Pardo et al. [29], interoperability is a capability that alleviates interdependencies. For example, organizations that already use the same data standards and have compatible regulatory frameworks can more easily link together existing buildings blocks to deliver new or integrate existing services.

Although many challenges can be found in the literature, research on governance challenges concerning inter-organizational services in particular remains rather scarce [8]. Therefore, we pose the following research question: *What are governance challenges in developing and maintaining inter-organizational digital public services and how do they evolve over time?*

We investigated a single case study on inter-organizational digital public services provisioning in-depth that involves the digitalization of invoicing in Belgian public administrations. Traditionally, sending invoices relied on direct communication between the procuring public organization and the private supplier. Invoicing services were characterized by a high administrative burden with long processing times and fines for public administrations due to late payments. Digitalization efforts have led to the creation of a common building block with user-to-machine (U2M) communication and machine-to-machine (M2M) integration based on the receiving capabilities of both businesses and public sector organizations.

The paper proceeds as follows. In Sect. 2, we review the literature and the challenges that have been identified in inter-organizational digital public services. Section 3 details

the research approach and provides the description of the case. In Sect. 4 we present and discuss our main findings, while Sect. 5 provides the conclusion.

2 Background: Governance Challenges

Research specifically focusing on governance challenges within an inter-organizational setting is rather limited [8]. To gain a first insight into governance challenges of inter-organizational digital public services, we also look at the general e-government literature on service delivery. In a study on challenges concerning the inter-organizational dimension of integrated service delivery, Christiansson et al. [8] classify challenges based on the development phases of a digital service (pre-conditions, design, and development and delivery). Klievink and Janssen [23] note that (inter)dependencies are a major challenge to realize coordinated public service delivery. Those (inter)dependencies can be affiliated with one or more factors. Factors that have been identified include technical, informational, (intra-)organizational, managerial, cultural, legal, political, institutional and strategic factors [7, 16, 23, 28, 34]. In the following, we consider technological, organizational and inter-organizational factors [7, 28] and corresponding challenges as a starting point to distinguish the governance challenges of inter-organizational digital public services in the case.

Technological factors (including factors due to information) relate to the integration of separate building blocks into functional services. Challenges in this regard have to do with finding agreement on semantic and technical standards to be able to integrate building blocks, to automate and exchange data in a meaningful way and to integrate and automate business processes and rules [6, 16, 23]. Christiansson et al. [8] add security issues. Elements identified by Chen et al. [7] also regard the quality of building blocks (e.g. ease of use, functionalities) and the quality of the overall service. Yang and Maxwell [34] also identify challenges related to the outsourcing of building blocks to the private sector, which have to do with the sharing of information concerning the specification of the building blocks or incorporating changes to the functionalities.

Organizational (also managerial) factors deal with management support towards inter-organizational collaboration, the creation of an organizational culture that incentivizes collaboration and holistic views on service delivery in relation to the user and the development of adequate organizational capabilities [7, 11]. They also include the development of adequate organizational capabilities [28]. One such organizational capability has to do with creating and sharing knowledge, both overall as well as for a specific service [8]. Lindgren and Melin [26] note challenges due to a lack of resources, which can be related to (inter alia) financial capacity [16, 33]. Organizations also need to possess the necessary technical capabilities to be able to adopt new technologies or integrate building blocks [6].

Inter-organizational (also institutional) factors contain challenges relating to how or why organizations collaborate in networks. Fan et al. [13] cite shared resource management, competing authority and the number of participants as specific inter-organizational challenges. Interdependencies are a main driver for collaboration [7]. Thus, knowledge about these interdependencies is a key element to foster and sustain collaboration. Axelsson et al. [2] note challenges regarding stakeholder management and the division of roles

and responsibilities. Additionally, Christiansson et al. [8] found challenges relating to expectations management on service quality, finding partner matches, and leadership.

According to Klievink and Janssen [23], the conclusion of agreements and contracts may be necessary to coordinate roles and responsibilities. Such agreements can also alleviate challenges relating to data ownership, risks and accountability [10].

Interoperability also has an inter-organizational component [7]. Specifically, it requires shared goals and values between collaborating organizations to develop common standards and share information [6]. Pardo et al. [29] find that interoperability necessitates that diverging policies are aligned and regulatory frameworks are changed to enable the sharing of information and resources.

Many authors also denote creating and maintaining trust as a necessary element for successful collaboration [4, 7, 34]. Trust is enabled through shared objectives, a shared understanding of the problem and past collaboration [6, 34]. It does not only decrease the complexity of the inter-organizational network, but also enhances organizational learning and future collaboration [6].

Dawes et al. [11] mention cultural challenges related to the creation and embeddedness of knowledge within organizations (which can be entrenched within processes and data structures), but also risk-averseness (or even resistance) towards inter-organizational collaboration and potential innovation [7]. Dawes et al. [11] advocate incentives for information sharing, a supportive culture towards collaboration at the organizational level, but also more generally advocate legal and regulatory frameworks and appropriate legal authority to overcome such challenges (see also [28]).

Concerning environmental factors, Cordella and Bonina [10] distinguish challenges posed by the administrative, legal and political context. Together, these context factors might constitute constraints on the possibility to integrate different building blocks across organizations and across administrative levels, to develop and use shared building blocks, to exchange of information and to allow inter-organizational collaboration to form. For example, the administrative context has an impact on the horizontal and vertical fragmentation of the supply of public services. The legal context also delineates who can take responsibility to provide specific services. The political context is relevant, because it can uphold commitment through executive support [16]. This is manifested through authority, but also the passing of necessary legislation and the provision of resources. Executive support appears especially relevant in the early phases of collaboration, before the formalization of roles and financial resources [16].

3 Research Method

To examine the governance challenges in the case of e-invoicing, we take a research approach that can ontologically be considered as case-centric research. The interpretivist and pragmatic approach towards epistemology is aimed at identifying governance challenges that are constructive in relation to the research question, i.e. the former is instrumental to the latter [18]. Following the research question, an exploratory case study was chosen. It offers the advantage of studying complex phenomena with a limited number of actors into extensive detail and allows to take the context into account, which is key to identify governance challenges [16]. A qualitative methodological choice allows us to delineate governance challenges in the case [36].

The criteria for case selection were the following: the case had to entail multiple public administrations, the involved public sector organizations collaborated to create a new integrated inter-organizational service, and the service could be conceptualized as a service delivery chain, based on the integration of existing building blocks or the development of new (shared) building blocks to deliver required capabilities.

We used a case that aims to digitalize invoicing services in Belgium. Data collection rested on multiple data collection types. A document analysis was done with public and internal policy documents (that were made available), laws, regulations, government white papers and technical specifications at the regional, federal and European levels. From the document, we could derive (changes in the) infrastructure and (changing) strategic and operational goals. This was complemented with 14 interviews, conducted between 2016 and 2018, with project and product managers of public sector organizations at the Belgian federal and regional levels. The criterion for purposeful sampling of the respondents was their affiliation with the governance of the invoicing services and the management of the corresponding building blocks (i.e. the common invoicing building blocks, enterprise service busses and enterprise resource planning systems). Using a semi-structured format, the questions ranged from motivations relating to architecture, solutions and goals, as well as governance challenges between the different users, stakeholders and the political level from a strategic, legal, organizational, informational, technical and financial point of view. This allowed us to delimit the most important governance challenges, but also revealed the interdependencies between the challenges, changes over time and coping strategies. The analysis rested on an iterative process that used the literature as a starting point to guide the categorization of the responses into governance challenges [20, 34]. Two follow-up interviews were organized in 2019 with the two central actors regarding the phases in the evolution of the service and the governance challenges we distinguished.

As part of e-procurement, e-invoicing consists of the electronic transfer of billing and payment information between business partners. Typically, this includes a supplier of procured goods or services, a buyer and/or intermediaries [31]. The digitalization of invoicing can be described by four phases. First, an initiation phase took place. Multiple regional administrations and the federal administration separately investigated options to develop a shared infrastructure for their own administrative level. In the second phase, a pilot was commenced by the federal government and later joined by one of the regional governments to (1) test the shared infrastructure and (2) to extend it to multiple administrations. The third phase dealt with operationalizing the pilot. It saw the incorporation of the elements of its evaluation, adapting to European legislation, the extension of the interaction to various stakeholders, alignment with other regional governments and the implementation of (uncoordinated) adoption strategies.

We also discerned a fourth phase that is characterized by expansion and adaptation. The use of the shared infrastructure was expanded to new groups of users, especially local administrations and organizations within the broader public sector. Additional capabilities were also added to the infrastructure to cope with differing expectations. The scope was enlarged as well. While first focus was directed to business-to-government (B2G) and business-to-business (B2B) invoicing, later phases also included government-to-business (G2B) invoices and other services associated with e-procurement.

4 Findings

This section presents and discusses each of the governance challenges we discerned in the case. Based on the methodology described above, we were able to distinguish seven main groups of governance challenges in the case through a triangulation of the literature, documents and interviews. While they have been put forward in the literature separately to a greater or lesser extent, we found that (1) each of those challenges varied over time. Moreover, (2) the governance challenges do not correspond one to one regarding the categorization of challenges into technological, organizational and inter-organizational factors. Rather, most governance challenges incorporate multiple factors. (3) Governance challenges can be interrelated and require coordinated action.

Table 1 comprises the governance challenges prevalent in the case. First, it details the factors of which each challenge is composed of, i.e. technological (T), organizational (O) and inter-organizational (IO). Second, it shows how the governance challenges evolve over the four phases in the case. In what follows we analyze each governance challenge and its prevalence over time.

Table 1. Governance challenges in e-invoicing.

Governance Challenges (factors)	Phase 1: Initiation	Phase 2: Piloting and Evaluating	Phase 3: Operationalizing	Phase 4: Expansion and Adaptation
1. User approach (T, O, IO)	Examination of the scope and choice of an approach towards the user as part of the strategy		The evaluation (and expansion of the) scope and approach. The coordination of adoption strategies	
2. Functionalities, shared infrastructure and capabilities (T, O, IO)	The identification of the necessary functionalities and capabilities	The piloting and evaluation of the service, connecting building blocks	Redefinition of functionalities, building capacity. Coordination of demand and supply	Expansion of functionalities, phasing out of legacies. Development of additional shared building blocks
3. Dependencies & relation to the environment (T, O, IO)	Identification of relevant dependencies	Coordination of dependencies	Coordination of internal path dependencies and external relation to the environment	
4. Division of roles and responsibilities (O, IO)	Identification of leadership	Sustaining coordinated leadership. Make a division of the roles and responsibilities of leadership and stakeholders. Build and maintain governance dynamics		
5. Stakeholder management (IO)	Identification of stakeholders, in relation to the user approach	Identification stakeholders for pilot. Creation of a stakeholder community	Identification of new stakeholders in relation to the user scope and approach, as well as towards adoption strategies. Coordination with stakeholder community	
6. Expectations management (IO)	Exploration of expectations and finding mutual understanding		Maintaining and coordinating changing expectations in relation to the user approach	
7. Agreements and contracts (O, IO)	Identification of necessity of agreements	Mutual understanding on cost distribution	Agreement on cost distribution, formal agreements depending on inclusion of outside stakeholders	

The first governance challenge refers to establishing a coordinated **approach to interact with the user (1)**, whereas administrations are fragmented. In the initial phases, the user approach dealt with setting up a strategy about how to address user needs and incorporate user preferences. This first required the identification of the (possible) internal and external users. For invoicing, these were private suppliers and their intermediaries on the on hand, and public sector organizations at all administrative levels on the other hand. Second, the (prioritization of the) scope of the service had to be settled (i.e. B2G and B2B invoicing, followed by G2B invoicing). The integrated user approach had an impact on many factors. Concerning technological factors, a new building block for invoices had to be developed. Regarding organizational factors, procuring public sector organizations had to change the way they interacted with their suppliers. With respect to inter-organizational factors, adoption strategies needed to be coordinated. This especially became a challenge in the later phases. Political priorities were not aligned, which perpetuated a fragmented approach. Agreement on the architecture of the service in relation to the user approach could only partly alleviate this lack of political coordination.

Delineating an approach to interact with the user is not straightforward. Many different (groups of) users might exist, each with different roles and varying capabilities [2]. While ideal, it is difficult to fully understand user needs [7, 8]. This is especially so as they might shift over time in reaction to the new service.

The second governance challenge is the identification, creation, linking and prioritization of (i) the **functionalities** that are distributed over many organizations into a **shared infrastructure,** as well as (ii) the **(technological and organizational) capabilities** those organizations have to possess to provide integrated services **(2)**. It is preferable to assess whether existing building blocks have the required functionalities and can be incorporated into the service before setting up shared building blocks [14]. Elements of such as an assessment can include the functionalities of legacies and the financial capacity to develop new building blocks. In the initiation phase, it was not immediately clear what functionalities were necessary or reusable. Governments eventually settled on a new building block, Mercurius, that allowed the manual entering of invoices through a portal, but clearly favored M2M communication. Mercurius was also designed to mediate the different receiving capabilities of small and large businesses as well as those of public sector organizations. This allowed the gradual implementation of ICT-changes [6].

A flexible infrastructure has been favored to overcome challenges [22]. Together with an incremental approach towards the integration of user groups, this could allow focus to be directed first on essential functionalities [8] and an effective end-to-end service design. Also, a gradual adoption of the service may overcome limited financial resources the project receives. Based on the interaction of the proposed service design with users, shared building blocks might need to be redefined. Janssen and van der Voort [21] advocate agile development methods to alleviate this challenge.

As a third challenge, governance has to constantly take into account **dependencies and the environment (3)** to establish high quality services, incorporate opportunities and quickly deal with possible constraints [12, 21, 23]. In the case, legal barriers for formal intergovernmental collaboration were high due to the federal state structure. This paved the way to an informal collaboration and governance challenges relating

to the division of roles and responsibilities and stakeholder management. Concerning technological factors an issue in the case related to the creation of a common identifier for each single public sector organization. Business rules had to be created on top of the standardized (European) invoice format, as well as additional functionalities to deal with the different syntaxes mandated by the European legislation.

Another challenge within the case was balancing the cost to alleviate path-dependencies in terms of time and effort with the overall progress in relation to the objectives. To deal with dependencies, interoperability is of vital concern [3]. Interoperability is especially relevant in the development of a service, for example concerning semantic interoperability or quickly connecting existing building blocks [32]. However, interoperability also needs to be maintained in later phases.

Other environmental factors that might be relevant are changing user preferences (both internal as an outcome of the changes in the service delivery and external from digital transformation outside of the public sector, [29]), and technological innovations [22] that might provide more suitable solutions regarding the needs of the users.

The fourth governance challenge refers to the **division of the roles and responsibilities across stakeholders (4)** to reduce role ambiguity and uncertainty among diverse actors [17]. In the case, authority resulted from multiple political decisions that gave a broad mandate to central government organizations within clearly defined strategic and operational goals [16]. For each administrative level, different public sector organizations were mandated to steer e-invoicing projects. Since the legal context did not allow hierarchical intergovernmental relations, those public sector organizations had to come to an agreement on a division of roles and responsibilities. This was found through the coordination of the approach towards the overall development of the service, the evaluation of the pilot, a distribution of financial resources, as well as measures to foster adoption and adapt to changes in the environment. Other roles were mainly tied to responsibilities concerning the management of the involved building blocks. Another challenge concerned the formation of leadership between stakeholders, and creating what Emerson et al. [12] describe as a collaborative dynamics. In the case, prior collaborations between the project managers created a functional partner match generated mutual trust [8, 34].

The distribution of roles and responsibilities is also likely to change over phases. In the initiation phase, for instance, an administrative simplification team was instrumental to bring together stakeholders in a more formal governance structure. Leadership in later phases was asserted by formally assigned lead organizations and project managers.

The fifth governance challenge deals with the **management of public and private stakeholders (5)** with different needs and interests. Good stakeholder management is key to building and maintaining commitment, since stakeholders are likely to give up part of their autonomy. Central questions are the identification of the internal and external stakeholders, the involvement of the users (in an active role as co-creators, or a more passive role as consumers), and the form of stakeholder management.

The governance regime in the case of e-invoicing can be characterized as a lead-government organization network [31]. To organize the diverse number of stakeholders (in addition to the building block owners, the representatives of businesses, intermediaries, and procuring public sector organizations), the lead-government organizations

opted for a loose stakeholder community. On the one hand they organized different groups of public and private stakeholders based on the capabilities of the building blocks under their responsibility. On the other hand, they reused already existing coordination structures. Stakeholders were involved based on the specific governance challenges at hand. Participation of stakeholder groups also varied depending on the phase and the particular governance challenge (in particular the specific user scope).

Sixth, closely related to stakeholder management is the **management of expectations (6)** between the variety of stakeholders' needs, motivations and expectations [8]. This is necessary to create a capacity for joint action [4, 12] and to reduce the possibility of stakeholder resistance [2]. For the invoicing case, the impetus for collaboration initially was the potential increase in the internal efficiency of the involved public administrations. Later phases saw shifts toward user-orientation and external efficiency. This had a profound impact on the architecture of the service. The lead-government organizations also had to deal with possible resistance caused by the disruption of digital invoicing in the market of intermediaries (e.g. accounting offices), since many businesses rely on those intermediaries to process invoices. One strategy was to change the expectations of the businesses to favor digital invoicing over sending PDF's. Gil-Garcia et al. [17] advocate balancing the varying expectations between different groups of stakeholders to diminish the risk that stakeholder resistance threatens both development and adoption. If users value the new service, adopt it and change their expectations, existing dependencies between partnering public (and private) organizations will likely intensify and create strong incentives to continue delivering integrated services.

The seventh governance challenge deals with finding a balance between the extent that **agreements and contracts (7)** are necessary and facilitate collaboration and the extent that they pose barriers to integration. Differences exist between agreements and contracts among involved organizations on the one hand and those with external service providers on the other hand [34]. In the case of e-invoicing, it was opted not to negotiate formal agreements because of uncertainty regarding the effectiveness of the preferred architecture. Nevertheless, agreements still had to be found concerning the cost distribution and to allow adequate flexibility for different governments to speed up the rollout of the service and the addition of functionalities. An equitable cost distribution was mainly realized through the negotiation of an open framework contract with the external service provider of the shared building block. This created trust between the partners and alleviated earlier uncertainties about commitment. As the service matures, more formal agreements between partners might become necessary to give voice and exit options to stakeholders (if they want to end the collaboration without disrupting service delivery) and to agree to a more concrete cost distribution.

In addition to these seven governance challenges acting separately, they are also likely to be **interdependent**. This appears especially relevant regarding the incorporation of a holistic view in relation to the entire service ecosystem. It appears that service delivery is not static, but changes over time. The external service environment, the dynamics of the internal service environment and their interaction both shape and change the provisioning of a service. Many groups of users may exist at different ends of the service chain. This can create additional complexity. Ideally, a flexible infrastructure can provide coping mechanisms to alleviate the different technical capabilities.

As the service matures, governance challenges may shift. In early phases, dealing with challenges regarding the architecture and a coordinated user approach was paramount. Later phases saw attention directed to stakeholder management, expectations management and finding agreements and contracts.

The relative importance of governance challenges can also change over time. When designing and developing inter-organizational services, delineating mutual goals, building trust and coming to a mutual understanding on the eventual infrastructure is vital for success. Once the integrated service becomes stable and more mature, governance needs to become more mature as well. More formal agreements might be preferable, but it is also important that they remain sufficiently adaptable.

5 Conclusion

The aim of our study was to identify governance challenges of inter-organizational digital public services. From a single exploratory case study, our analysis revealed seven diverse groups of governance challenges that are themselves interdependent. They are related to (1) creating a coordinated approach to the groups of users by various organizations, (2) exploring the necessary functionalities offered by different organizations and building shared infrastructures, (3) managing path-dependencies and changes in the environment, (4) dividing roles over many organizations and coordinating leadership, (5) identifying and managing the different needs of stakeholders and (6) their expectations, and (7) the extent of clear agreements and contracts, the latter which includes the distribution of costs among the stakeholders.

The challenges do generally not fit clearly within the more typical classification of challenges into technological, organizational and inter-organizational factors in the literature. This suggests that governance strategies cannot deal with just one factor at the time, but that they have to address factors simultaneously to enable integrated service delivery. The case also revealed that public services are not static, but change over time and that accordingly governance challenges and their relative importance may change as well. To enact the transformation of service provisioning and foster adoption, attention might have to be paid to the different speeds at which users can integrate.

The inter-organizational context adds complexity and creates further dependencies. Challenges in this regard relate to maintaining (possibly changing) shared objectives among the actors and coordinating adoption at the political level, managing uncertainty, prioritization the development of functionalities, expanding the service delivery to different types of users, building a capacity to be adaptive and cope with legacies, and incorporating the time necessary to implement changes, develop capabilities.

The limitations of the single case study research include the generalizability of the governance challenges faced in different countries, in different contexts, within other types of services as well as governance challenges faced by other groups of stakeholders.

The findings point to practical insights that might also be relevant for similar contexts. Public administrators in charge of specific inter-organizational services or for the separate building blocks might benefit of a holistic view on digital services as well as long-term and step-by-step development and adaptation processes, where governance is aligned to the challenges.

While out of the scope of this research, it might be possible that to deal with these challenges, public organizations can take advantage of multiple and changing instruments for governance, that rely on different mechanisms. This is a path for future research, together with building on the identified challenges through the examination of different inter-organizational services.

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