Dynamic Capabilities for Information Sharing: XBRL enabling business-to-government information exchange

Marijn Janssen
Delft University of Technology
m.f.w.h.a.janssen@tudelft.nl

Yao-Hua Tan
Delft University of Technology
Y.Tan@tudelft.nl@tudelft.nl

Abstract

Recent scandals have stressed the need for information sharing among companies and governments. The sharing of information is not easy as companies want to keep their administrative burden low, whereas governments need high information quality. These drivers have resulted in the initiating of programs for developing infrastructures for information sharing. In these programs public and private organizations work together to create infrastructures satisfying the needs of both companies and governments. The creation of business-to-government information sharing is complex and meets many organizational and technical challenges. Information sharing requires that existing information assets are used and combined, information sharing and processing capabilities are used. This would be need to be done repeatedly and rapidly in different sectors.

This study investigates the dynamic capabilities necessary to realize the information sharing. Specifically the capabilities for developing the infrastructure and the governance of the infrastructure are investigated. Our analysis shows that companies and public organizations need to create a different set of capabilities to enable information sharing. The creation of information sharing requires extensive knowledge about the existing landscape. The infrastructure should be flexible enough to support the different situations and governance is necessary to ensure that information sharing arrangements are customized for the situation at hand and to make decisions concerning its further development.

1. Introduction

The exchange of information between companies and governments have recently gained a lot of attention due to 9/11 requiring better custom control of imported/exported goods, the financial crises in which regulators had no idea about the financial health of banks, food scandals, in which horse meats was added to other meat and overspending of hospitals in which expenses were declared multiple times. There are many other examples available. Consequently the exchange of information between private companies and public sector organizations becomes more and more important [1, 2]. Companies exchange a plethora of information with government agencies including financial and statistical information. Whereas in the past a large number of documents on paper were exchanged, nowadays more and more information is communicated digitally. Often reports by companies are generated by separate departments who use the organizational applications to extract the information, process the information into the required format and enter the information to report it. These activities add to the administrative burden. The administrative burden is even increased as public agencies are autonomous and define their information demands independently of each other. As a results companies have to report information to various agencies in different ways.

There are some transformations taking place in the way companies can provide information electronically)and governments can collect and analyze the information [3]. Instead of businesses having to report to multiple public organizations the idea is to create a one stop shop for information sharing. The basic idea is that governments should reuse the already stored information in the applications of the companies. This should ensure higher information quality and avoid that information quality is lowered in the process. The reuse of information stored in the companies' systems requires the collaboration from the companies and the software vendors to make this work. The exchange of information requires closer relationships between companies and public organizations to ensure that the information flows are realized at low cost and high information quality is ensured. Information sharing is affected by a wide range of factors emanating from both within and outside of the organization including technical, organizational, political and economic factors [e.g. 4, 5]. This all requires a new situation which proves often difficult to achieve [6] and limited insight is available in capabilities requires and impact [7].

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Whereas for citizens often a generic one stop shop is created, information sharing in business-to-government (b-to-g) is highly dependent on the particular situation. For example the providing of financial information by banks to the government requires other information than an industrial company importing, storing and exporting goods. These two examples are ruled by different legislation and regulations, the public values differs (e.g. ensuring stable financial markets and ensuring food safety) and the information is reported to different organizations (National Bank and Food inspection). Legislation requires companies to report these kind of information. As a result within each sector information sharing can be different.

Governments are initiating programs that aim to transform b-to-g information exchange to reduce the administrative burden for companies and improve the accountability at the same time. These are often driven by the Extensible Business Reporting Language (XBRL), which provides a foundation for the exchange of reports and data [8]. Creating an information sharing infrastructure requires understanding of the situation (e.g. legislation, information needed, agencies involved) and new capabilities to make use of this. Yet the process of achieving and maintaining high levels of information sharing is complex and is prone to failure. In each situations different ways of collecting and analyzing information might be appropriate and there is a need for having capabilities that are able to handle these diverse situations. In this paper we will analyze the capabilities requires for realizing these type of information exchanges. Literature is reviewed about dynamic capabilities, infrastructure development and governance. The case studies of XBRL/SBR in the Netherlands will be investigated and capabilities will be derived.

2. Background

2.1 Dynamic capabilities

Business-to-government information sharing requires that existing information assets are used, the information from different information assets are shared, combined and processes. This needs to be done for reporting done in different sectors. To make this happen both governments and business need a particular set of capabilities.

The term 'dynamic capabilities' is commonly used in strategic management literature which suggest that a firm needs to adjust its resource mix and thereby maintain the sustainability of the firm's competitive advantage. In our situation not competitive advantages, but adapting to changing circumstances is a key driver. The need for information sharing is determined by laws, regulation and policies, whereas capabilities are need to comply with this legislation and adopt. Society demands that governments are able to be agile to deal with these kind of situation and are able to react quickly. Although for business a reason for adoption might be viewed as a competitive advantages. Clients might favor that companies are collaborating with government and provide their information in smooth manner and it this way they might become a trusted partner and gain a competitive advantage by advertising this.

Dynamic capabilities are a response to the resource-based view, which considers resources as static and is thus unable to explain how organizations deal with changing environments. The *dynamic capability theory* (DCT) describes the ability of organizations to adapt their assets and resources to rapidly changing environments [9, 10]. Dynamic capabilities help organizations change their resource configurations in order to adapt to a changing environment. Teece et al. [9] define dynamic capabilities as "the ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments" [9, p. 516]. Eisenhardt and Martin [10, p. 105] describe dynamic capabilities as "a set of specific and identifiable processes". Furthermore, they argue that dynamic capabilities for organizations are idiosyncratic in their details as they emerge from path dependencies. Path dependencies take into account organizational history, past decisions and the procedures and routines involved. Path dependencies are frequently viewed as a constraining factor for change and limit the number of options available. Path dependency are viewed as an important concept when it comes to understanding social and political processes, as established institutional patterns and structures often reassert themselves in the process of adopting new technologies [11].

Eisenhardt and Martin [10] have found that dynamic capabilities change in nature depending on the level of transformation. In stable markets they are detailed, analytic and stable processes and resemble the traditional conception of routines. They also argue that the evolution of dynamic capabilities is also affected by the pacing of experience. One motivation for conducting this study is to derive dynamic capabilities capturing the experiences of successful practices, which in turn can be used to develop new practices.

There are various capabilities derived in various domains. Wade and Hulland [12] have provided an

overview of resources by using Day's [13] taxonomy of three types of processes: inside-out, outside-in, and spanning. Eisenhardt and Martin [10] have identified capabilities for 1) the integration 2) the reconfiguration and 3) the gaining and releasing of resources. Feeny and Willcocks [14] have identified nine core capabilities categorized in three groups: 1) business and IT vision, 2) design of IT architecture and 3) delivery of services. Sambamurthy, Bharadwaj and Gover [15] have provided an overview of capabilities for organizational agility which include 1) External relationship management, 2) Market responsiveness, 3) IS-business partnerships, 4) IS planning and change management 5) IS infrastructure 6) IS technical skills, 7) IS development, and 8) Cost effective IS operations They found three organizational capabilities, e.g. agility, digital options, and entrepreneurial alertness. They also found three strategic processes capabilities, e.g. capability-building, entrepreneurial action, and co-evolutionary adaption. Klievink and Janssen [16] have identified four groups of capabilities: 1) stakeholder, 2) technology, 3) transformation and 4) service delivery for creating integrated service delivery. Chuang and Lin found that technology, human, and business resources to develop an infrastructure capability [17]. They further found that infrastructure is a condition for information quality and improving performance. The overview shows that capabilities can considerably different dependent on the problem and domain under investigation. There is not overview of capabilities for information sharing. In this paper we will use the overview as capabilities as an input for developing information sharing capabilities.

2.2 Information sharing, infrastructure and governance

There is a daunt of literature about information sharing (see for example [2, 18-20]). Information sharing can improve decision-making making [4] result in more efficiency and higher information quality [2, 21]. Information sharing meets a complexity, with significant management, technology, and policy challenges [18, 22, 23] and are influenced by many design dimensions [24]. Scholl and Klischewski [25] found that for advancing e-government the integration of government information resources and processes, and interoperation of information systems is essential. They found the need for interoperability and integration capabilities, whereas middleware offers the functionality for achieve this. They mention that heterogeneous systems and lack of networking

capabilities blocks the adoption. This emphasizes the importance of having capabilities for developing information sharing infrastructure.

Information sharing literature is stressing that apart from technology other aspects play an essential role (see for example [18, 22, 23]). Infrastructure and governance are often complementary to each other, although the interplay is largely neglected in research [26]. Tiwana and Konsynski [26] have hypothesized that the benefits of infrastructures are enhanced when they are complemented by appropriate governance structures.

Governance mechanisms refer to the management and regulation of the elements of the system [27]. Governance mechanisms determine how communication, responsibilities and decision-making structures are formalized [28]. Effective governance requires an infrastructure that is adaptive and agile enough to respond to changes [26]. Only if the infrastructure is able to adopt governance can be effective. Adaptation requires a modular infrastructure which can be configured and changed. According to Parnas [29] modularization is a strategy aimed at reducing interdependencies among modules by trying to hide as much information as possible within a module and keeping the interfaces simple. The essence of a module is that it can be changed without affecting the system as a whole or can be used in different reconfiguration without affecting the module [30].

3. Research approach

The aim of this research is to identify and understand the capabilities required for realizing the information sharing between businesses and governments. Dynamic capabilities help organizations change in order to adapt b-to-g information sharing and are needed for adoption. Given this objective, we investigated the XBRL by investigating the Standard Business Reporting (SBR) project in the Netherlands. The project was aimed at contributing to the reduction of the administrative burden of both government and businesses. The central government estimated that around 350 million euro's worth of administrative tasks of businesses could be cut.

Informed by the capabilities as found in the literature, we started by interviewing four key persons from both governments as business. This provides our initial staring point. This resulted in a first model of the capabilities needed for XBRL adoption. We developed and successively refined the capabilities by conducting an additional eleven semi-structured interviews were carried out over the course

of a three months period. In addition publicly available documents were systematically analyzed. This resulted in a first model of the capabilities needed for XBRL adoption.

4. Case study: XBRL and SBR

4.1 Background

Private organizations share information with all kinds of public organizations to comply with the regulative requirements. Information sharing can cover a broad range of purposes such as tax information, statistics, finance and industry regulation. The amount of reporting has significantly grown over the recent years, Financial companies are confronted with more stringent industry regulations like Sarbanes Oxley Act [31] and Basel II [32]. As a results companies can have to report the same information multiple times to different government agencies in different formats. All this results in a significant administrative costs for companies.

The Extensible Business Reporting Language (XBRL) can be used for sharing information by exchanging reports [8]. XBRL is an XML-based standard for exchanging reports. XBRL is often guided by taxonomies providing the content for information sharing. XBRL can be used for internal financial and non-financial reporting which makes it possible to use this for a broader range of reporting functions including statistical, taxes, and all kinds of inspection data. XBRL enables interoperability among applications regardless of the differences in the internal systems. The broader use of XBRL by public organizations provides the opportunity to create a one-stop-shop for reporting information by integrating the reporting functions. Nevertheless the type of information required by public organizations remains different.

4.2 SBR Case study

Standard Business Reporting (SBR) is the government-initiated program for creating standardized reporting processes in various sectors. Although originating from accountants and auditors it can be used for all kinds of reporting purposes. In the old situation business had to report all kinds of report to various governmental organizations who acted relatively independently. They all posed their own reporting standards and requirements on the companies. The broader vision behind the project was that all reports required by government could be submitted as a single report by making use of the

XBRL format. XBRL was originally developed as a XML-based standard for external financial reporting. Nowadays it is also used for internal financial and non-financial reporting which makes it possible to use this for a broader range of reporting functions including the reporting of statistical, tax, safety, security and other inspection data.

XBRL is often used as the heart of SBR, but SBR requires a safe and secure infrastructure for information sharing. Figure 1 provides an overview of the situation. On the left the companies are shown, which can operated in one or more industry and can vary in size. On the right hand side the public organizations are shown requiring of information from the companies. In the middle the infrastructure is visualized consisting of three core components processes, data and technology.
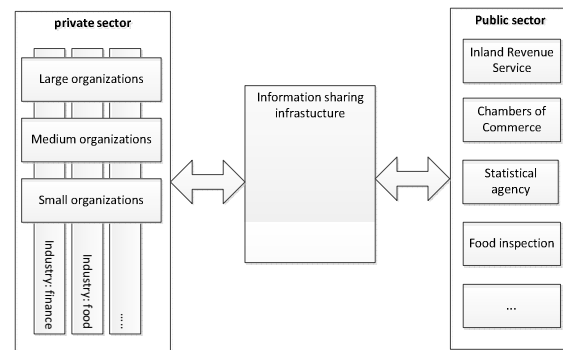

Figure 1. Overview of main actors

4.3 Infrastructure

The infrastructure facilitates the information sharing. The infrastructure should be flexible enough to facilitate various kinds of information sharing arrangements. For the information sharing between business and governments, the developers can select the appropriate building blocks and configure them. Instead of developing from scratch they can reuse process, data and technical elements .

1. Processes: the processes are used for capturing data and ensuring that data is validated and provided to the correct public organizations. There are various streams of information which require different types of processes. At the processes level the basic functionalities for information sharing can be configured.

2. Data: The data contains 2 elements (1) an standardized information exchange format, (2) a national taxonomy. A taxonomy classifies data in such a way that it can be standardized, shared and re-used across the actors involved in SBR.

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The data model for information exchange is laid down in a national taxonomy. For information sharing components of the taxonomy can be selected to create new types of reporting.

3. Technology: there are various technologies involved. Technologies for ensuring end-to-end security, for authentication and identification, for validation of data format and content, for acknowledging receipt and so on. Often there are various ways to accomplish this. For example there are various levels of security possible. Dependent on the situation the appropriate technical building blocks can be selected and configured.

The use of SBR is based on the idea to capture the information at the source. If data is not captured at the sources there might be corrections made to the information influencing the its quality. As such the basic idea in SBR is that information should be captured by the source, which is a well-known Business Process Reengineering (BPR) principles (see [33]). This poses additional requirements on the collecting of information, as information should be captured from the source databases of the businesses.

Instead of all government agencies developing their own dedicated infrastructures, a generic infrastructure is created in which processes can be configured, the appropriate data elements from the taxonomy can be selected and appropriate technology elements can be selected. The modular infrastructure can be used to create new information sharing between businesses and government by reusing already available modules

4.4 Governance

To arrange and develop the organizational arrangements there is a need for having deep insight in the situation of the users. The users are heterogeneous and their requirements vary. Also it is necessary to have an understanding of the sector (financial, food, etc), as they all pose different requirements on the infrastructure. Therefore a multi-level governance board is employed as shown in the figure 2. On the top of this figure the general governance board is shown which consist of high-level representatives of businesses, business associations, ministries and public organizations. In the level below there exists 2 types of governance boards; one for the sector under study (financial, food, etc.) and one for the technical aspects like the taxonomy development, update of new technologies and so on. The interdependencies between the generic infrastructure and the customization for

sectors and even for large companies makes it sometimes difficult to make a decision, as sectors might vary in their maturity, installed base of systems, information used for control, adoption of XBRL and might have other concerns.
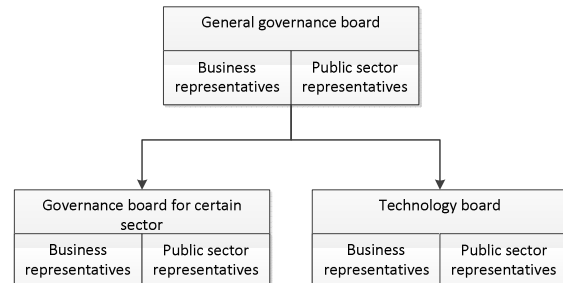

Figure 2. Overview of multi-level governance boards

For business it is important that they are represented and are able to influence decisions made. These decisions can influence the investment they need to be made and how resources and challenging implementation would be. The presence of businesses result in more deliberate decisions and legitimacy for the decisions made.

5. Findings

We investigated both governance and technical capabilities for information sharing as both are necessary for realizing the exchange of information. Our findings confirm the hypothesis of Tiwana and Konsinski [26] that infrastructure and the governance are intertwined. The main reason for this is that infrastructure arrangement largely influence the costs and investments necessary for business to adopt XBRL-based information sharing. For example the selection of one data field from the taxonomy that is not supported by the installed business application of the company might cause the need for making large investments, whereas, the relative value for public organizations might be limited. Instead of requiring all information from the start a discussion can be started to include the data fields in the future; once the software vendors have adopted their business applications and the companies have implemented the new versions as part of their regular control and maintenance activities. Another example of this dependency was the adoption of XBRL by the financial sector. The financial sector can use XBRL for structuring their own internal processes and systems. Once they have this ready it is easy to report to the government. However, in the current situation often interfaces are developed and put in front of the

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systems. These interfaces translate the data into XBRL format as required by public organizations. In this way financial companies need to make investments in these interfaces to report to the government. Once they use XBRL for their internal processes it becomes easier and cheaper to report the information.

The infrastructure consist of components including data models, information processing processes, technology specifications, protocols, standards, connectivity protocols, reliability and security protocols, components to scale and (web)services. An infrastructure will not be used by having it and needs to be guided by decision making processes and institutional arrangements to create the conditions and information sharing arrangements.

Table 1 provides the overview of capabilities found in the case study. The capabilities are split to capabilities of the public organizations and companies involved in implementing XBRL and are divided into technology and governance capabilities.

Table 1. Overview of the capabilities of governments and businesses per implementation stage

Stage		Exploration	Implementation	Exploiting
Government	governance capabilities	• build external (strategic) relationship • create collaborations network • develop business case • communicate benefits • understand sector idiosyncrasies • commit businesses • develop a long term planning	• contract facilitation • deal with tensions in conflicting concerns • coordination of companies and public organizations • risk management	• adapt to new legislation • manage adaptability of software vendors • manage operational relationship • monitor performance • monitor contract • accountability
	technology capabilities	• understanding of the opportunities by technology • XBRL knowledge • to build a taxonomy • to build generic infrastructure building blocks	• integrate information and infrastructure • integrate proprietary infrastructure and generic infrastructure • configure new processes • extend taxonomy to facilitate new options • re-use infrastructure building blocks • security and privacy • software development • technology skills for implementation	• understand, monitor and change internal process and systems • to determine impact on companies internal systems • react to changes • keep up to date with XBRL change • technology skills for control and maintenance • dealing with incidents and vulnerabilities
Business	governance capabilities	• understand long term impact • influence implementation decisions	• influence implementation decisions • to take advantage of internal XBRL opportunities	• monitor changes (in the regulative environment) • influence implementation decisions • distribute or receive software updates
	technology capabilities	• develop XBRL understanding • develop required technology knowledge	• understand and change internal process and systems • integrate applications with the infrastructure • software development • adapt XBRL • security • technology skills for implementation	• able to adapt internal processes and systems • technology skills for adapting and maintenance • dealing with incidents and vulnerabilities

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We observed a change of capabilities over time and classified these into three stages.

1. Exploration: This phase is aimed at understanding the opportunities and limitations. This include understanding the sector, looking at what kind of information is needed and determining how information can be shared.

2. Implementation: This phase is aimed at configuring the infrastructure and developing the situation and information can be shared. The end of this phase is a product which is able to exchange information among businesses and governments.

3. Exploitation: the control and maintenance of the situation and further evolvement. Due to changes in regulations, changing ambition level and so on, the information sharing is annually changed and updated.

In SBR the different industries and even companies within certain industries were found in different stages. Whereas a number of financial companies already realized the implementation of XBRL and are in the exploitation stage, other industries (like food and health) are in the exploration phase. From the table they can learn which capabilities are necessary to adopt and use XBRL

Dynamic capabilities might be built on each other in this way influencing the implementation sequence [10]. Some capabilities may be foundational to others and so must be learned first. In our case study we observed that the exploration of the new opportunities provided by XBRL/SBR were an important first step and a necessary conditions to advance. These capabilities are necessary to explore and understand the opportunities of XBRL. For each sectors (e.g. financial, food etc.), but also within a sector (e.g. large or SME) a new way of exploration need to be established as the circumstances differ. Once the idea materialize they need to be implemented and realized. This is followed by the exploitation of the created information sharing arrangement.

The government requires capabilities to understand the flow to make the connection between data sources and use of information. In the case study we observed that all often a functional perspective was taken on information processing. A functional perspective defines and analyzes what the systems is required to deliver in terms of the system's behavior, e.g. validation of information, secure processing,, availability, scalability and so on. The functional perspective takes in essence a black box approach

and does not take into account knowledge about the systems internal operations. This is suitable for a high-level perspective, however, for realizing b-to-g information sharing this was often found to be insufficient. In-depth understanding of the systems already in use, the operational and control processes of business can lower the investments necessary and at the same time improve the information quality as no complicated processing is necessary. As such there should be a basic understanding of how the individual parts relate together and what the impact on information quality is. Instead of taking a functional view a constructivist view should be taken when designing new information sharing arrangements.

The success is dependent on mutual trust, cooperation and understanding of each other needs and wishes. Therefore building internal and external commitment to adopt new forms of information sharing is key in the capabilities found. The governance capabilities of the government found in the exploration phase all are related to building long-term relationship and creating commitment. This might sounds counter intuitive, as government can use regulatory instruments to enforce adoption. However, this was not viewed as desirable as a main purpose of adopting XBRL is the reduction of administrative burden of companies. The risk of not having these capabilities is that the administrative burden might not be reduced or can even be increased.

In each of the phases different capabilities are required. For example risk management is an important capability when implementing XBRL Contract management is important in the exploitation phase as systems might not be available all the time, e.g. if a system is down before the deadline (as set by law) that tax reports should be handed in, it might result in fines. As such the availability of both company and government infrastructure during these periods of time is essential.

Technical capabilities include the ability to make use of the opportunities and are in essence focused on creating and configuring a modular infrastructure that is flexible and adaptive enough to be used in various sectors and can adapt to changes. Adapting to changes is an important requirements as often legislation is changed influencing the type of information that needs to be shared between companies and the government. In particular adaption requires not only technical infrastructure to be available, but also the governance and management of the partnership among companies and public sectors. Adaption to new legislation means that not

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only the generic infrastructure needs to be changed, but also the information systems of companies need to be adapted. For this purpose the Dutch Tax organization has created a community with software providers and some large companies who develop their own systems. By discussing what kind of new legislation is expected, how to adopt this legislation, software vendors can be prepared to adapt their software and ensure that the changes are implemented and realized in time. XBRL provides the possibility of including rules for expressing legislation. Some changes might only require changes of these rules, which is relatively easy. The hard part is to ensure that companies using the software will have installed an updated version in time. It is likely that the capabilities will change by the adoption of the Software-as-a-Service (SaaS) business models of software companies. In the SaaS model software companies do not have to distribute new versions of software anymore.

Whereas the governance capability differ considerably between companies and governments, the technical capabilities are more similar. The main difference in the technology capabilities is that governments should ensure the reuse of the infrastructure by extending the taxonomy and reusing already existing building blocks, whereas this is not a concern of businesses. Technical flexibility and the ability of adapt by government is in particular important as solutions are typically dependent on the type of reports (financial, statistics) and other contextual characteristics like the sector (food, financial etc). This might even results in a variety of different architectures [7], which can be based on the same building blocks and considered as part of the same infrastructure.

6. Discussion

XBRL is not always successful and proves often hard to implement and realize [6]. As such understanding which capabilities should be developed to make effective use of them can avoid failure and progress the adoption of XBRL.

Teece et al. [9] emphasis the path-dependencies suggesting that dynamic capabilities are idiosyncratic and might be unique for organizations. However Eisenhardt & Martin [10] suggest that specific dynamic capabilities show considerable similarities across firms. Dynamic capabilities can exhibit commonalities across sectors, but may also be idiosyncratic to a certain sector and path dependent in its emergence [10]. The focus of our analysis was primarily on the commonalities so others can learn from it. Nevertheless some of the capabilities are path

dependent like the development of XBRL expertise, which is dependent on the already available technology knowledge.

Although the case study is presented as a single case study, various sector (finance, food) were investigated. In the different sectors a similar set of capabilities was found suggesting that there are considerable similarities among situation. Furthermore, this also suggests that the capabilities are generalizable to other situations and sectors which are not investigated in this research.

We looked at capabilities at the organizational level, rather than at the personal level as they are often generated in teams. Capabilities do not necessary to be available in house by the organizations. Some of the capabilities can be bought on the market. For instance technology skills for implementing XBRL can typically be acquired by hiring consultants and implementers who take care of these activities. In contrast a capability like building relationships or contract facilitation is typical a capability that you want to have in-house as this concerns the core of your activities, might not be easily acquired and have a long term impact. Furthermore once developed this capability can be used in other sectors. When bought on the market the risk is that a critical capability might disappear that cannot be easily developed or acquired.

Governance and infrastructure capabilities have rarely been studied together [26]. In our study the critical dependence of both is demonstrated. Infrastructure development and governance are interwoven as the infrastructure limits the ability to adapt. If new building blocks or technical capabilities need to be developed this will take a certain amount of time and consume resources. On the other hand governance needs to be able to influence infrastructure developments, as investments and actual reduction of the administrative burden is dependent on the decisions-made by the interaction among companies and governments. The infrastructure should be flexible enough to allow for difference information sharing arrangements among sectors. This shows a clear mutual dependency and causal pathways between infrastructure development and governance.

7. Conclusions

Information sharing in a business-to-government setting is complicated. Many projects are long lasting and even fail. In this research we investigated the dynamic capabilities necessary for creating information sharing among business and government enabled by the XBRL. Information sharing requires

that existing information assets are used and combined, information sharing and processing is developed. As each sector is different this needs to be done several times.

Our analysis showed that both companies and public organizations need to create a set of capabilities to enable b-to-g information sharing. Furthermore we found that in different stages (named exploration, implementing, exploitation) different capabilities are required. The exploration phase demands other capabilities than when implementing or when exploiting the infrastructure.

The use of information from the systems of companies requires extensive knowledge about the limitations and opportunities provided by these already installed systems. Information sharing with companies requires in-depth knowledge about the situation. Governance is necessary for ensuring that the proper information sharing arrangement is used within the sector. For this purpose infrastructure needs to be flexible enough and be able to support a variety of implementations. Apart from having a flexible infrastructure, building internal and external long term relationships and commitment to explore and exploit new forms of information sharing is key aspect in the governance capabilities found.

The dynamic capabilities identified in this study capture the experiences of successful practices, which in turn can be used to develop new practices. This might result in the finding of new capabilities or other might be obsolete. In future research the set of dynamic capabilities can be refined and generalized.

In this paper we looked at capabilities necessary for creating information sharing. The availability of these capability can help the adoption of b-to-g information sharing. We did not investigate adoption factors such as commitment, strategy and readiness and incentives like perceived benefits and costs which can all influence adoption. More research in this direction is recommended to understand the conditions and drivers for adoption.

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