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# TOWARDS A REPOSITORY OF E-GOVERNMENT CAPABILITIES

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**Abstract.** The paper aims to contribute to the development of an e-government capabilities repository. The purpose of this repository is to increase the level of success of the e-government projects and initiatives. The results are based on an examination of a multidisciplinary body of knowledge, an iterative structured methodology and a comparative in-depth case study performed in two Canadian public administrations. We analyzed the data to identify the presence or absence of the capabilities, the evolution of these capabilities and their interrelationship. We proposed a preliminary knowledge repository of e-government capabilities composed of 4 interdependent categories: the strategic capabilities, the project capabilities, the business capabilities and the technological capabilities.

**Keywords.** E-government. Organizational capabilities. Dynamic capabilities. Repository. Case study

## 1 Introduction

The goal of this paper is to present a work-in-progress towards the development of an e-government capabilities repository. The aim of this repository is to support Government and public administration (PA) in the development, deployment and/or renewal of their e-government transformation strategy.

This repository can be presented as a reference guide to the required capabilities for the successful deployment of an e-government initiative or project. It can help governments, particularly from developing countries, to increase the level of success and avoid risk in undertaking any types of e-government initiatives and organizational change. In other words, this repository may be utilized as a tool for PA, ministries and public agencies, firstly for identifying the needed capabilities prior to starting any e-government initiatives related to electronic service delivery; when they develop their e-government project/strategy or when they face challenges and difficulties during the e-government development process. Secondly, it will also serve as a diagnostic tool for defining what are the existing capabilities that can be leveraged for the e-government deployment and evaluating the strength and weaknesses of these capabilities. Thirdly, this repository will help clearly define the gap between the

required capabilities and the existing one in the PA and facilitate the organizational change.

This preliminary version of the repository is developed based on in-depth case studies realized in two different Canadian PA. The e-government transformation is studied here using a strategic management and capabilities perspective. This perspective provided a rich and in-depth observation of the phenomenon studied.

This paper starts by introducing a brief description of the theoretical framework. Then, the methodology is described, followed by the comparison between the studied cases. Finally, in the results section, the first version of the e-government capabilities repository is presented.

## **2 Theoretical background**

The goal of this section is to introduce the theoretical framework of organizational capabilities proposed in the literature that serve as starting point for our research.

The organizational capability concept was intensively studied in the strategic Management field. Several researches were dedicated to define and simplify the understanding of the organizational capabilities concept (Amit & Schoemaker, 1993; Collis, 1994; Grant, 1991; Zollo & Winter, 2002). Based on the synthesis of these definitions, an E-government capability is defined for this research as the leveraging, the combination and the coordination of resources, competencies and knowledge through different processes to set up e-government project (or initiative).

The presence of organizational capability is firstly based on the identification or the existence in the organization or availability outside of the organization of resources, competencies and knowledge. Secondly, it is through specific processes and at a certain point in time that the organizational capabilities are effectively materialized.

This definition implies that any strategic initiatives or project is based on the existence in the organization of capabilities (Renard & Soparnot, 2010; Renard & Soparnot, 2010). When an organization is planning to set up and/or deploy its strategy, it should previously identify and assess its available organizational capabilities. Depending on the situation and the strategic objectives the organization wants to achieve, they will determine which organizational capabilities are required to be mobilized at which level and which capabilities will need to be created, acquired or developed. Referring to an organizational capabilities knowledge repository can facilitate this activity. This repository will play the role of diagnostic tool for the organization where we can retrieve a classification of needed organizational capabilities for a specific strategy.

St-Amant and Renard (2004) proposed a first body of knowledge (BoK) for e-government service delivery. This BoK is composed of two broad groups of capabilities, the capabilities of progression (1) and the capabilities of context (2). These two groups of capabilities are composed of different categories and management domain.

The capabilities of progression (1) refer to the capabilities that support the realization of the e-government project. This group of capabilities contributes directly to the creation and/or development of the other type of capabilities. The capabilities of progression are divided in two categories. Firstly, the change management capabilities are adopting an organizational behaviour approach that emphasizes more the human and organizational aspects of the progression. These capabilities are facilitating issues such as human resource management, personal and organizational development. Secondly, the management by project is more techno-economic oriented analysis of the progression. This category focuses on the management of deliverables: how to plan, organize, coordinate and assess deliverables. It is targeting one specific e-government initiative and cannot be generalized to the whole e-government project. The project approach of e-government is adopting a production perspective that require to fully understand and assess the needs to determine among others a precise budget and scheduling to realize deliverables that answer to clear and known functional specifications.

The capabilities of context (2) are the existing capabilities in the organization. They exist through the service delivery processes already available to the citizens. This group of capabilities is divided in three classes: Information and Business Governance capabilities, Business capabilities and Information resources management capabilities.

The Information and Business Governance capabilities are composed firstly of the organizational capabilities required for the coordination between the top management and stakeholders of different business, specific to each PA on one side and its related information on the other side. Secondly, the business capabilities are composed of the set of capabilities that allows organizing, planning, directing and assessing of all the business resources allocated to E-government projects. Thirdly, the information management capabilities define the capabilities the organizing, planning, directing and assessment of all the information resources allocated to E-government projects. This set of capabilities may be under the responsibility of internal or/and external experts and specialists.

### **3 Methodology**

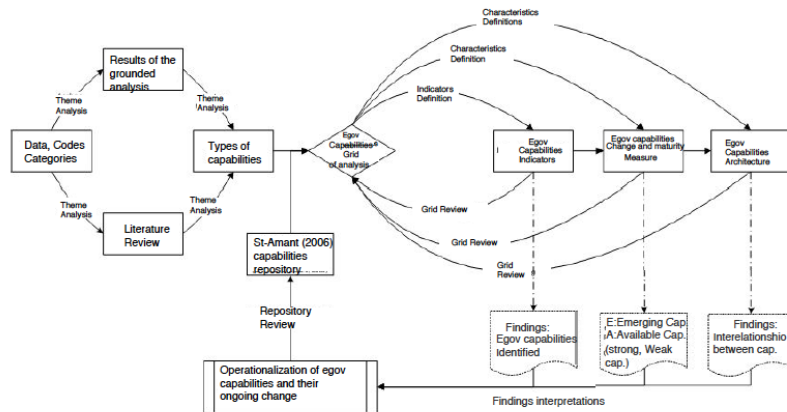
The research project is to present the preliminary stages in the development of a repository of e-government capabilities based on St-Amant and Renard (2004) body of knowledge for e-government service delivery as theoretical framework to realize our empirical study and propose a more accurate and updated repository of e-government capabilities.

This research is using an exploratory design combining different qualitative methods to reach the objective. Firstly, a document analysis synthesizing scientific and practical knowledge in the field strategic management, information system management and e-government was realized. We reviewed and codified explicit knowledge available such as books, academic papers, research reports, white papers, body of knowledge and repositories in various disciplines. Secondly, a comparative in-depth case studies methodology for gathering evidence was used. The case studies

methodology had the purpose to operationalize the e-government capabilities and to test the framework. This first test remains exploratory in nature and needs to be examined within a broader context. This study required a detailed description of the environment, which allows the exploration of unforeseen elements and relationships to offer better insights into the organizational dimensions.

The case studies were conducted in two Canadian administrations named GOP and MINR<sup>1</sup>. The research design was developed based on Carroll and Swatman's (2000) "structured case study" model based on a pre-defined research cycle and Yin's (2003) "embedded case study sampling strategy". The data collection methods include the analyses of multiple documents and archival records, participation in meetings and workshops and individual semi-structured interviews. It provided richness, depth and validity of information. Such triangulation reduces bias and it is recommended in case research (Yin, 2002). Atlas/ti content analysis software was used to codify the qualitative data. Given the exploratory nature of the research, different analysis techniques were used including narrative strategy, explanation building, temporal bracketing, and pattern matching. With respect to the various sources of information, the researchers were able to develop a qualitative in-depth compilation of data within study's environment, as well as a storytelling of events and activities focused specifically on developmental issues.

St-Amant and Renard (2004) BoK for e-government service delivery served as a starting point for collecting, coding and analysing the data. This framework was progressively reviewed throughout the different analysis iterations as described by figure 1.



**Figure 1. E-government capabilities analysis process**

<sup>1</sup> The two institutions requested from the researcher to use the acronyms for any publications related to the cases.

We have defined different management domain that documents the categories of capabilities as presented. Each field of management was described by a grid combining a set of indicators that help us identify the capabilities, if they exist or not; if it was available if yes, at which level of maturity (emerging, moderate or advanced) and the level of strength. Finally, we noticed that the interrelationship between these capabilities is also an important factor to study that leads us to define the integration of the capabilities.

## 4 Analysis and findings

The GOP and MINR are the pioneers in the implementation of e-government in Canada. The GOP is an autonomous PA created in 1965 to manage pension plan annuities. It is directed by a board that votes, allocates budgets, takes decisions and authorizes major initiatives. A cabinet shuffle in early 2000 marked a turning point in the type of management and led to the adoption of a new e-government vision. The GOP's e-government development is presented as a broad transformation called "Service delivery renewal" to meet the challenges of a growing demands (given the reversed pyramid of age) and the pressures of efficiency.

The MINR is the largest, the most strategic ministry, as well as the most complex one. It is creating 85% of the revenue for the government. Since its creation in 1961, the MINR knew several important organizational transformations with a solid history of in successful project management and Information system development.

In both PA, the e-government development process started at the beginning of the 2000's. We have examined this development process through 3 strategic plans of 4 years. In the following paragraphs we will describe the capabilities identified in both organization during the 12 years.

### 4.1. GOP E-government development process (2000-2012)

The GOP has invested to build, acquire and develop four types of capabilities throughout the 3 strategic plans that are different from what have been defined by St-Amant and Renard (2004). In the following table we summarize the domain of management composing the categories of capabilities identified by period at the GOP (Table 1).

**Table 1. Identified E-government capabilities at the GOP**

E-government phases	E-Government capabilities
<p><b>1998-2004:</b>            "Service Renewal strategy project": infrastructure implementation and the development of the first e-services (online presence, interactive pdfs</p>	<p><b>Creation of a strategic capabilities</b> : strategic thinking, management of the deployment of e-government project, resources allocation, Business and IT Governance Management, creation of internal and external value, Partnership management.</p> <p><b>Enhancement of Project capabilities:</b> communication management, quality management, risk management, project management , change management, support management .</p> <p><b>Business capabilities leveraging:</b> service delivery management, management of the relationship with partners, management of IT impact, information</p>

forms)	management, results management and human resource management. <b>IT capabilities leveraging and consolidation:</b> Management of IT strategy, strategic planning and support management, enterprise architecture, IS development management, IS human resource management, IS service management.
<b>2004-2008:</b>  “Internal digitalization and shared infrastructure”: technological development, online service adoption, collaboration for shared infrastructure and integrated e-services.	<b>Consolidation of strategic capabilities:</b> better adaptation to the environment and flexibility, resource allocation and internal value creation, customer value creation, partnership multiplication and management of the IS/ Business Governance. <b>Development and consolidation of the Project capabilities:</b> Exploitation of the existing skills in project management, adoption of new competencies. learning new techniques and tools in project management, learning change management. <b>Technological capabilities consolidation:</b> Learning and adapting new technologies, knowledge acquisition and creation in web-based technology. <b>Leveraging business capabilities:</b> secure the success of change management, skills development in customer needs analysis and data collection.
<b>2008-2012 :</b>  “Multichannel strategy and Organizational transformation”: transfer to online services, workflow and organizational change to increase the efficiency, value-added services and increase cooperation and partnership.	<b>Leveraging of the strategic capabilities:</b> Continuous strategic brainstorming, strategy deployment management, resource allocation and value creation, Business and IT Governance, external value creation and partnership management. <b>Redefinition of Project capabilities:</b> communication management, quality management, risk management, project management, change management, support management, creation of new performance unit, management and organization by project <b>Enhancement of the Business capabilities:</b> Learning the management of a new channel, management of new roles and new jobs in the PA and create customer relationship management. <b>Leveraging the acquired technology capabilities:</b> exploitation of the newly acquired capabilities into new project, new partnership between IS/Business

As described in figure 2, the GOP has invested to build, acquire, consolidate and develop four types of capabilities throughout the 3 strategic plans. These capabilities are different from what have been defined in by St-Amant and Renard (2004).

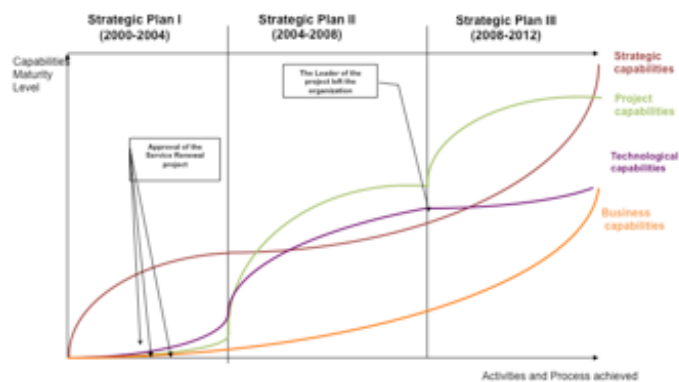
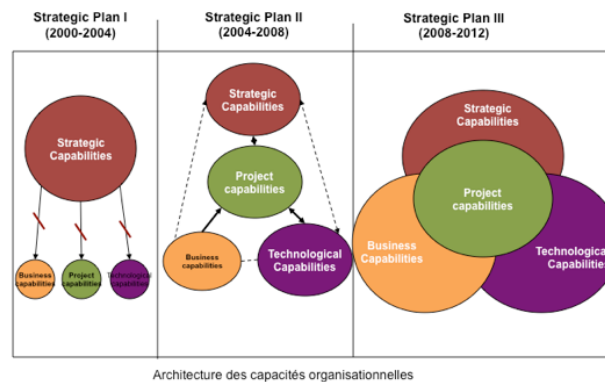


Figure 2. E-government capabilities development at the GOP

These capabilities were progressively acquired, consolidated and integrated. Their maturity evolves through the different E-government projects. The social interaction and organizational learning played an important role in the capabilities integration and progression.



**Figure 3. GOP 's architecture of e-government capabilities**

The strategic capability was created in the first period. This category of capability played a critical role in the success of the e-government development. The business, technological and project capabilities were present in the organization but they were inconsistent with the e-government development objectives. Consequently, the GOP either was abandoned or changed these capabilities. Then, during the second period, the GOP invested in developing the project capabilities that played an important role for linking and integrating all the capabilities. Also, they consolidated the technological and business capabilities. Efforts were invested for jointly developing the business and the technological elements of the e-government. This collaboration was a source of innovation at different level. These innovations became new projects adopts and enhanced all capabilities.

#### **4.2. MINR E-government development process (2000-2012)**

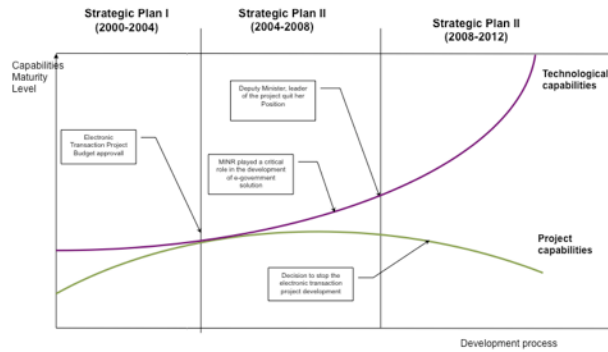
The MINR's e-government development followed a different journey. They focus mainly on the internal strength during the two first strategic plans: The technology and the project management. In the middle of the third strategic plan, the e-government development process was aborted for a lack of performance, low level of registration and use of the system, overbudget and implementation delays. Even if it is publicly described as a technological success, It was considered as an important organizational and project failure. In 2008 they officially admit the failure of the the project and progressively retracted.



**Table 2. Identified E-Government capabilities at the MINR**

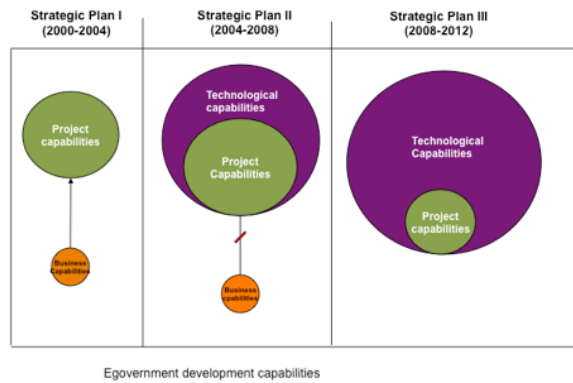
E-government phases	E-Government capabilities
<b>1998-2004:</b> Consultation and E-government appropriation	<b>Leveraging of Project capabilities:</b> Project management, methodology and change management <b>IT capabilities leveraging and consolidation:</b> Existing capabilities used previously in the development of internal information system and Intranet implementation
<b>2004-2008:</b> Development and implementation of the public service delivery	<b>Development and consolidation of the technological capabilities:</b> Enterprise architecture, web technology skills and knowledge acquisition, application management, infrastructure management, <b>Consolidation of the project capabilities:</b> The IT department took the leadership from the project management resources. it was totally absorbed and more and more isolated from the organizational to an independent office dedicated with a strong IT expertise
<b>2008-2012 :</b> Record of a failure, Progressive divestment and exit from the project. Postmortem analysis and inspection. Timid and slow relaunch of the e-government development	<b>Development of the technology capabilities:</b> Security knowledge and skills acquisition, Internet and Web technology consolidation, Identification and authentication, software development.

The MINR leveraged the existing knowledge, skills and resources in term of project and technological capabilities. These two types of capabilities were developed and consolidated prior to the e-government project. It was considered as reference in terms of know-how, methods, project and change management in the government. The MINR had a long history of success in IS and IT projects. The MINR was able to easily adapt to the Internet platform technologies and infrastructure. It was the first one to develop complex technologies, such as online authentication and identification. They strengthened the technological capability by developing their knowledge through training and seminars, they increased the resources by partnering with external firms and hire IT experts and consultant.



**Figure 4. E-government capabilities development at MINR**

We observed the development and maturity of the technological capabilities through 3 strategic plans. During the first period, the MINR decided not to leverage neither develop the business capabilities and develop the e-government separately from the organization. The project capabilities were leveraged but the organization did not invest until they were progressively absorbed and strengthened the technological instead of developing a dynamic project capability (figure 5). The technological capabilities, with the number of online service developed and the technological project undertaken, was consolidated and strengthened very fast. The MINR became a reference for all the PA (Figure 4 and 5).



**Figure 5. MINR's E-government capabilities architecture**

However the project was led by an IT team that concentrates all the efforts on the IT aspects and loose track of all the project management dimensions such as budget management, schedule and planing management and performance management. Also, the lack of communication and collaboration with the business resources and the lack of knowledge and consultation of the business

during the first period led to serious difficulties in the e-government development process and impacted in the quality of online service developed. It also explain the very low registration and adoption of the online service. The investment was made mainly on the technological resources, competencies and knowledge. It became the predominant e-government capability. They have failed to develop or aquire any other type of capabilities .

## **5 Discussion and Conclusion**

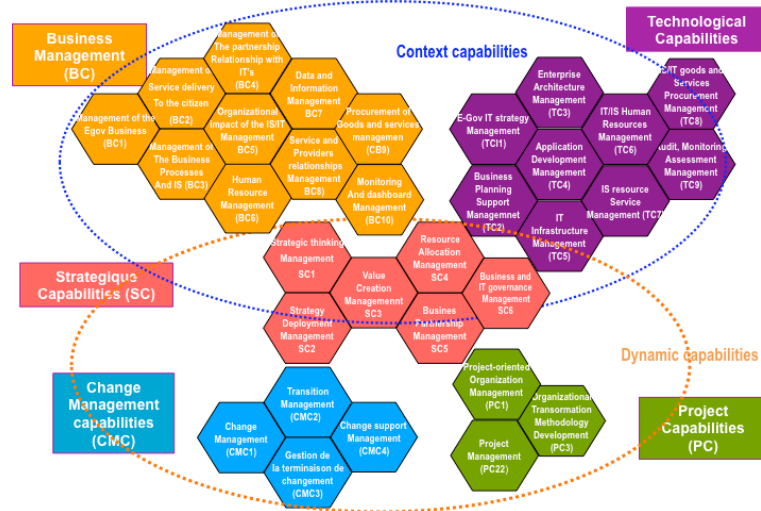
The GOP and MINR cases confirmed the need of a combination of interrelated capabilities to develop the e-government. To identify this capabilities we use as starting point St-Amant et Renard (2004) theoretical framework that we progressively reviewed and enriched using a triangulation between the data collection, the analysis techniques, and the litterature review.

Firstly, one of the main difficulty we faced using St-Amant and Renard's Framework is that the strategy formulation is supposed to be predetermined confirming that the strategy is already defined. Our results show that it is not the case, at least in the Canadian PA. The strategy is not always defined, neither is clear. Both organizations did not have any strategic capabilities when they started the e-government project. The development of this type of capabilities played a major role in the success of the GOP throughout the strategic plans, while the absence of the strategic capabilities was one of the most important causes behind the failure of the e-government project for the MINR after more than 7 years of e-government development.

Secondly, the project capabilities were added and redefined as dynamic capabilities that have a transformative potential for PA and impacted on the capabilities of context that are already available in the organization. Thirdly, what emerges from the data is that e-government is not predetermined but evolves throughout projects. Each new initiative launched created change and required constant adaptation. In other words, the e-government is not a goal or finality, but rather a continuous change that requires constantly revision of the stock of available capabilities. Finally, we have proposed a revisited framework of capabilities based on 4 interrelated and integrated categories. We have operationalized the capabilities based on the iteration strategy reviewing constantly the data and the literature. We have identify the need of a combination of four types of capabilities to the development to support the continuous change: Strategic, project, business and technological. Acquiring these capabilities is important, but it is not enough. It is as important to adapt, develop and renew these capabilities in order to avoid rigidities.

In conclusion we propose a revisited repository of E-government capabilities (figure 6). The repository is based on a set of premises. The first premise states that government and PA requires the presence of capabilities (dynamic and/or organizational) that they will have or that they will need in order to realize successfully the e-government transformation and overcome the challenges of e-government service delivery adoption and implementation (they are facing today or in the future). The second premise is that the repository is composed of different ideal-type of capabilities needed that means it can differ or require adaptation depending on

the context. Last premise specifies that the absence of one of these capabilities could be critical for the success of an e-government service delivery implementation.



**Figure 6. E-government capabilities repository**

The identification of the e-government capabilities is challenging. Firstly, the capabilities can be determined through the produced outcomes. According to Croom and Bachelor (1997), capabilities are revealed through time. They are observed in actions (Renard & Soparnot, 2010). Data were here coded and analysed by examining the activities of the e-government development process and highlighting the capabilities that were leveraged if existing or developed within the process. Secondly, the organizational capabilities show the organizational know-how. And given the tacit nature of some capabilities, the interpretation, the perceptions and the understanding of the interviewed constitute the foundation to explore the nature and maturity of the identified capabilities.

Finally, the e-government capabilities are described specifically to their context. It is important to explore and develop control criteria for social interactions (Nonaka, Takeuchi, & Umemoto, 1996). These processes helped identifying the capabilities, their absence or presence, and helped interpreting as well.

This repository is a first stage that requires to be consolidated and constantly updated based and adapted based on new case studies.

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