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Enterprise Architecture and Organizational Reform: A Project Debrief

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Enterprise Architecture and Organizational Reform: A Project Debrief

Completed Research Paper

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Abstract

This paper studies on how enterprise architecture (EA) is used as a tool to assist organizational reform. In particular, we examine how institutional factors influencing organization change process through an EA project. We conduct a qualitative case study and use institutional theory as a lens to analyze data from an organization. This analysis offers insights about how exogenous and endogenous factors influence organizational change, and how organizational structures get shaped, diffused, and institutionalized. Our study provides understanding how stakeholders are involved in project activities in multiple levels and phases of the institutionalization process; namely innovation phase, theorization phase, diffusion phase, and institutionalization phase.

Keywords: Enterprise architecture, institutional theory, organizational change, organization reform, institutionalization.

Introduction

Nowadays many organizations have adapted enterprise architecture (EA) approach to develop their operations. For example, EA is used for strategic planning, IT planning, and business-IT alignment (Azevedo et al., 2015; Magoulas et al., 2012; Ross, 2009; Simon et al., 2014; Winter, 2010). As a corollary, EA has gained attention from the researchers and practitioners (Dang & Pekkola, 2017b). However, majority of the EA literature focuses on EA itself, not on its use or organizational implementation (Dang & Pekkola, 2017b; Simon et al., 2013). For example, little emphasis has been put on *how EA projects influence organizational change process* (Dang & Pekkola, 2017b; Dang, 2017). This ignorance is noteworthy as EA implementation influences organizational practices significantly.

An implementation of IT into an organization initiates changes in functions or organizational forms (Volkoff et al., 2007). There are several aspects on organizational change, such as context, processes, and outcomes in multiple organizational levels (e.g., organizational, sub-system, or sector level) (Kuipers et al., 2014). IS studies have revealed a wide range of interactions between IT and organizations changes (Forman et al., 2014; Orlikowski & Yates, 2006; Volkoff et al., 2007). For example, the impact of IS in changing nature of work (Aanestad et al., 2014; Leonardi, 2014), IS and innovation (Mani et al., 2014; Mani et al., 2014), IS driven change in organizations (Nordheim & Päivärinta, 2006; Rukanova et al., 2009), and many others (Volkoff & Strong, 2013; Volkoff et al., 2007).

However, these studies tend to focus on change mechanisms or motors of change (Van de Ven & Poole, 1995). In other word, they try to explain the change in organization. However, this paper focuses on the factors influencing the institutionalization process. We investigate the change through an EA project, the analysis ranging from organization level to individual level, thus following Kuipers et al. (2014) suggestion. Our study thus provides better understanding about the complex layers of organizational change and its management. In this paper, we thus examine the role of EA in institutionalization process

in an organization. We try to understand institutional pressures and their contextual conditions when an organization employs EA projects. We also examine how institutional factors may influence the change in organizations, how organization started to change under the EA project, and how those changes diffuse. Our research questions are: “How EA project influences organizational change process and what are institutional pressures there?”

We conduct a qualitative case study in a large EA project. The data is collected from semi-structured interviews from EA project key persons. The interviews are supplemented by secondary data such as project plans, project proposals, regulations, and news and official announcements in the government sites. We employ institutional theory as a lens as it provides an appropriate means to examine both exogenous and endogenous factors to understand the process of change in the organization (Scott, 1995). The chosen approach also supports the societal characteristics view in IS (Orlikowski & Barley, 2001). We contribute to literature by providing in-depth understanding about how institutional factors impacts organizational change. For example, how internal and external pressures influence stakeholders and their activities in the EA project, further leading to broader organizational changes.

The paper continues with background section. It is following by research settings and methods section. Then we present our empirical findings, and the paper continues with discussion part. The paper ends with a concluding chapter.

Background

Institutional theory and EA research

IS scholars use institutional theory to study how different changes take place in organizations (e.g., institutionalization process) and how institutions impact other institutions, structures or other organizations (e.g., institutional effects) (Jepperson, 1991; Mignerat & Rivard, 2009). While the former seems to gained little attention from the researchers, the latter is more broadly studied (Mignerat & Rivard, 2009; Weiss et al., 2013). According to Weiss et al. (2013), this is because institutionalization process studies tend to focus on micro level analysis in organizations, such as on individuals or groups. This results the studies being context specific. Few studies on institutionalization processes include Swanson and Ramiller (1997) who studied the diffusion and applicableness of new IS through the institutional view, while Avgerou (2002, 2000) focused on institutionalization within an organization. Yet these studies did not provide a comprehensive view to external and internal pressures in the organizational change. We aim at studying this process of forming organizational structures and procedures through an EA project.

Regarding to EA studies using institutional theory, there seems not to be many studies using it as an analytical lens (Dang & Pekkola, 2017a). The few exceptions, however, focus more on the outcomes of EA rather than the process of change. These include the studies focusing on legitimacy of EA frameworks (Magnusson & Nilsson, 2006) and problems related to EA in organizations (Hjort-Madsen & Gøtze, 2004). Moreover, some scholars examined the impact factors on EA adoption, including government and political factors influencing EA development (Hjort-Madsen, 2006, 2007) and management and organization factor impacting EA adoption (Hjort-Madsen & Pries-Heje, 2009; Janssen & Hjort-Madsen, 2007).

There are some studies focuses on micro level analysis using institutional lens in EA research. For example, Dang and Pekkola (2016a, 2016b) examined how institutionalization process is shaped by institutional factors in different phases of EA projects, and proposed possible solutions for emerging problems. Iyamu (2009) focused on challenges in EA institutionalization and identified some challenges being related to both business aspects and technology perspectives. Weiss and colleagues (Aier & Weiss, 2012; Weiss et al., 2013) studied the influences of institutional factors on the EA institutionalization in relation to effectiveness. They identified several factors, such as stakeholders trust, organizational governance, and enforcement potentially having an impact to processes.

Yet these researches do not provide understanding how EA project activities influence organizational change and what are the external and internal institutional pressures there. We thus focus on this gap to understand different institutional perspectives in organizations, and how they can conform to environment for securing resources and increasing competitiveness, and ultimately, helping them to survive.

Theoretical Framework

Institutional pressures and organizational change

Institutional theory has been used in IS in order to understand “*how institutions influence the design, use, and consequences of technologies, either within or across organizations*” (Orlikowski & Barley, 2001:153). The theory provides understandings about “*the processes and mechanisms by which structures, schemas, rules, and routines become established as authoritative guidelines for social behaviour,*” (Scott, 2005:408). Institutions in institutional theory can be understood, as Scott (1995:33) asserts: “*Institutions consist of cognitive, normative, and regulative structures and activities that provide stability and meaning to social behavior. Institutions are transported by various carriers cultures, structures, and routines and they operate at multiple levels of jurisdiction.*”

Organizations lean to legislations, norms, culture, and societal behaviour to achieve legitimacy for their survival (DiMaggio & Powell, 1983; Scott, 2005). As a result, organizations look like others in terms of structures and procedures, for instance. This refers to isomorphism in institutional theory (DiMaggio & Powell, 1983). The theory thus provides a lens to explain the *change in organizations*. There are three main isomorphic mechanisms whose occurrence influences organizational change (DiMaggio & Powell, 1983). *First*, coercive pressure or regulative pillar (DiMaggio & Powell, 1983; Scott, 1995), occur when organizations change their operations, behaviour, or practices to comply with different formal and informal pressures, such as competition from other organizations, or legislative pressure from the government (c.f. Pishdad et al., 2014). *Second*, mimetic pressure or cultural-cognitive pillar (DiMaggio & Powell, 1983; Scott, 1995), occurs when organizations from other organizations, for example in their activities, behaviour, or procedures to maintain their position in competition, to reduce rivalry, and to be more successful or legitimate (DiMaggio & Powell, 1983). *Third*, normative pressure, or normative pillar (Scott, 1995; DiMaggio & Powell, 1983), emerge from the pressure of professional groups driving and influencing organizational change as the organization’s stakeholders tend to mimic their colleagues and their behaviour and activities (Palthe, 2014).

We use these mechanisms of institutional theory as a lens to study different activities and behaviour in an EA project to understand how they influence the organizational change. In other word, the relationship between organizational structure and societal environment during the EA project implementation is studied. This analysis helps us to understand both internal and external institutional pressures during the organizational change (Meyer & Rowan, 1977). In our case, that is described later, the EA related organization change was driven by national administrative reform. It stresses that, “[...] *encouraging state agencies in using IT and communication technologies in their operations and services between and among the agencies, and in-between the agencies and citizen and enterprises [...]*” (VN, 2011:6) and “[...] *using IT in the state agencies’ operations, supporting information and public services for citizen and enterprises in order to improve transparency and quality of services*” (QD1605/QD-TTg, 2010:1). These suggestions, along with other factors, influenced the state agencies. They responded by reforming their administrative procedure, particularly in the services provision sections. During the response process, new organizational structures and procedures were invented and shaped. Those new structures and procedures influenced old, non-changed ones. This sets our starting point as we try to understand how the processes of establishing new structures and procedures formed through the adoption of EA project. We also consider other competitive forces potentially affecting project activities and further the organization (DiMaggio & Powell, 1983; Oliver, 1991). For example, we monitored a national index, which measures the use of IT applications in the agencies, and whether it improved due to the organizational change by the project’s activities. In this paper, the terms “organizational change” and “organizational reform” are used interchangeably.

Institutionalization process

IS scholar have used institutional theory to study organizational change and appropriate processes (Mignerat & Rivard, 2009). Two institutional processes are identified in the IS literature. The first category is *institutionalization process*, which studies how institutions are formed in different stages of organizational change (Mignerat & Rivard, 2009). For instance, how different institutional factors influence the IS innovations (Wang & Swanson, 2007) or how users change their behavior after the IS project implementation (Cousins & Robey, 2005). The *second* category focuses on how institutions influence other organizations or their structures (Jepperson, 1991; Mignerat & Rivard, 2009). For example, how highly regulated organizations tend to have similar IS configurations (Gosain, 2004), or how organizational policies influence IS implementation (Kaushik & AparnaRaman, 2014).

In this paper, we focus on institutionalization process under an EA project. We analyze factors and their influence on the project from individuals and organizational viewpoints. This approach allows us to understand the insights of the project activities in multiple organizational levels (Dacin et al., 2002; Tolbert & Zucker, 1996). Also, it allows us to study the institutionalization process which may have been less attractive in the literature (Mignerat & Rivard, 2009). Although there are several approaches to illustrate and analyze institutionalization, two approaches stand out, namely, Tolbert and Zucker (1996) and Greenwood and colleagues (2002). Although they greatly resemble each other, their main difference is that while Tolbert and Zucker's (1996) pay attention on the institutionalization of new institutions or structures, Greenwood and colleagues' (2002) focus on how old structures or institutions become deinstitutionalization.

Besides, Mignerat and Rivard (2009) also suggest five stages of institutionalization. Those are *innovation*, *theorization*, *diffusion*, *institutionalization*, and *deinstitutionalization stage*. *Innovation* stage occurs when the jolts in the institutional environment influence current institutions or structures. This leads to new approaches or ideas to emerge, and possibilities to change. The sources of jolts could be social, technology, or legislations. Innovation stage introduces solutions (e.g., new structures, institutions) in response to challenges or problems that the organization faced. The scope of these solutions are very organization-specific at this stage. *Theorization* stage starts with assessing those new structures or institutions from previous stage. It includes explaining, justifying, abstracting, and elaborating all possible features. These activities legitimize new structures and institutions (Tolbert & Zucker, 1996). This means new solutions comply with current norms. Next stage is *diffusion*, when new structures or institutions are legitimized, and diffused in the organization (Mignerat & Rivard, 2009). In the *institutionalization* stage, new activities and behavior are considered as taken-for-granted. Finally the organization begins the *deinstitutionalization* stage after the earlier institutionalization has remained alive for a period of time (Mignerat & Rivard, 2009). Next we will examine this process of institutionalization and different EA project activities to investigate broader organizational change.

Research Method

We adapt qualitative case study approach because it helps us to understand organizational context and its social and historical of incidents (Myers, 2009; Stake, 2005). It also allows us to understand internal and external factors that are challenging to quantify, such as organizational rules, stakeholders' behavior, their activities and cultural context, and different contradictions (Stake, 2005). Furthermore, qualitative case study approach helps us to understand the change process and institutional change (Dacin et al., 2002).

Data collection

The data is derived from an EA project in a local government (later Ceta). The case is chosen for several reasons. First, it fits well with our objectives as the EA project in Ceta was established as a response to the master program on the state administration reform, obligated by the central government in September 2012 (VN, 2011) and encouraged by a master plan about using ICT in state agencies to enhance electronic government (QD1605/QD-TTg, 2010). As a result, the changes happening at Ceta and its EA project allowed us to study institutionalization process, understand the factors influencing those processes, and further to understand the roles of EA in the organizational change as a result of internal and external institutional pressures. Figure 1.a illustrates the structure of Ceta and the scope of EA project ranging from level 1 to level 3: administration (e.g., central), about 34 department and district (thereafter Dept.) and 168 sections (e.g., sub departments, sub districts, and communes), around 1300 services.

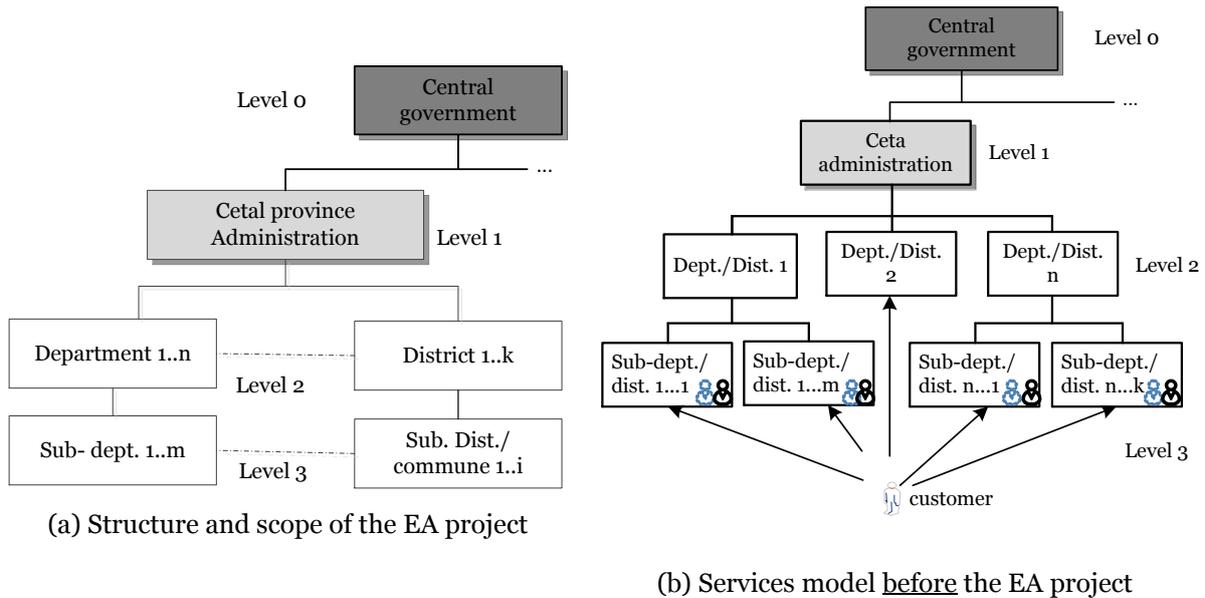


Figure 1. The administrative structure (a) and services model before the project implementation (b)

Second, the project is important Ceta in terms of budget and potential impact. As the project covers several agencies and its public services civil servants, the project could affect up to 2 million inhabitants, directly or indirectly communicating with the government. The project budget was about 27 million euros. Once implemented, it was estimated that the changes would influence the way both service provider (e.g., civil servants in the government) and customers (e.g., citizens and enterprises) act and behave toward services. Figure 1.b illustrates the services model in Ceta before the EA project was started. Here the customers have to approach different agencies for different services; they have to fill in numerous forms on paper; and they may also have to visit agencies physically multiple times, causing inconveniences and even increasing corruption. For example, if a needed service is related to three departments, the customers have to go to all departments to get their service. Moreover, internal procedures in Ceta (e.g., procedures within and among agencies) faced several problems due to fragmentation, disconnections and lacks of interoperability. This lead to ineffective and inefficient public administration and services.

Interviewees (job role, number of interviews)	Selected main secondary sources
<ul style="list-style-type: none"> • Bond (CIO, 2) • Austin (Project manager, 2) • Isaac (Enterprise architect, 1) • Henry (Enterprise architect, 1) • Paul (EA worker, 1) • Peter (IT specialist, 1) • Ronald (Civil servant, 1) • Ramsey (Civil servant, 1) 	<ul style="list-style-type: none"> • Project plans • Project proposals • Project reports • Deliverables reports • Project diaries and internal meetings • Regulations and news in official sites

Table 1. The Main Data Source

Third, Ceta provided as a full access to the project. Table 1 lists our data sources: we interviewed the stakeholders, who directly have participated in the project or were affected by the project activities, and we got several documents as secondary data sources. The interviewees included CIO, project manager, EA team members and users. We conducted eight interviews, ranging from 45 to 60 minutes, in summer 2015 and 2 interviews in August 2016. Those were audio-recorded and transcribed. We first interviewed CIO to understand the project’s activities and different stakeholders’ roles. Then we identified appropriate stakeholders being involved in the project for future interviews. We also used the guidance

of Walsham (2009) to identify the saturation point so that we could decide when adequate amount of data is collected, that is adding new informants would not provide new insights.

In addition to formal interviews and secondary data, we discussed with people being familiar with the EA project in Ceta (e.g., project members and leaders). This helped us to gain understanding about the political, social, and contextual issues of the project. Consequently we used triangulation technique (Stake, 2005) to minimize bias.

Data analysis

We transcribed the interviews by using both axial and open coding. Then we used interpretive research approach as guided by Walsham (2006), and used the lens of institutional theory to analyze the data. ATLAS.TI was used to help us in this endeavor. We moved smoothly between the interview transcripts, secondary data sources, and open coding technique for identifying the issue. We also used axial coding to form larger categories. Several themes emerged during the coding. They include, for example, external pressures, influence from the leaders, and the influences of rules. These themes were identified and compared in several sources. We also checked inconsistencies in the interviews and documents.

As we used qualitative approach, several techniques were used for justifying our approach. First, we used triangulation technique in data collection to minimize bias (Stake, 2005). Second, we used the approach of Walsham (2006) and Klein and Myers (1999) for conducting and evaluating interpretive data. Finally, the authors discussed the findings for insights about the data.

Findings: Organizational change and Enterprise architecture

Next we will present project activities and their relations to organizational changes that occurred during the EA project. We particularly focus on changes related to services and organizational structures, and how the stakeholders respond to those. It should be noted that the central government (Level 0, Figure 1) had master plan on reform administrative activities and suggested that using ICT in state agencies is one of their key priority (VN, 2011; QD 1605/QD-TTg, 2010). However, those master plans did not have any formal regulations or obligation to apply EA. In other words, the organizations chose EA approach by themselves, from their own reasons.

The changes in Ceta started with senior managers deciding to reform current situation in services providers section – as illustration in Figure 1. The idea was to improve citizens and enterprises convenience, and make administrative procedures effective, efficient and transparent. The CIO said, “... speeding up the administrative reforms and using IT in the agencies by utilizing EA project to transform paper-based services to on-line services reduced the number of times the customers have to go to the agencies for their services”. As a result, they decided to use EA project to assist their objectives in all levels of administration. This evidently indicates that the role of senior managers was very important in term of choosing EA, and not something else, such as enterprise resource planning or other management approaches. Table 2 shows the main project timeline, its activities and change status during the EA project adoption. There are four main phases, first one starting in September 2012, the first five new models were established in June 2013 with 457 services, then expanded to 15 models and 965 services in March 2014, and finally legitimized by the Premier Minister in October 2015.

Timeline	Main activities	Change status
2012.9 - 2013.6	Proposed centralized model for services (CPS) and standardized procedures and selected services (e.g., internal and external).	No physical or operational changes but plans and documents how to do them.
2013.6 - 2014.3	1 CPS in level 1 (Fig.1a) and 5 CPS in level 2 (Fig.1a) were successfully established Reformed, standardized and went live 457 services.	Changes in Central administration (level 1 in Fig 1.a) and 5 department (level 2 in Fig.1a).
2014.3 - 2015.10	Expanded 15 CPS. Reformed, standardized and went live 965 services.	Change in 15 agencies.

2015.10 -	The central government approved the CPS model, and it became approved and applicable to all state agencies. Time to process the applications was reduced by 70% in comparison to previous model.	The change was approved by central government. Centralized of services and other agencies must apply new model by the end of 2015.
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Table 2. The changing status and main project activities in Ceta

The project was initiated in September 2012 by deputy director of the IT department. However, project responsibility was quickly adopted by the officials, appointing Ceta deputy mayor as project manager. The EA team was granted permissions to use all necessary resources within Ceta-region (e.g., from Level 1 to Level 3; Figure 1). For example, the project management unit was allowed to order human resources from other departments, even the head of department, and they were able to recruit high skilled people at any time (QD3152, 2012). The lack of common approaches and standards in EA practices led to several difficulties and challenges when choosing tools, techniques, and approaches. Those included, for example, issues in utilizing the new model for services under the EA project, reforming administrative procedures, and dealing with legacy systems. To cope with these concerns, Ceta hired an external consultant to propose new solutions and conduct feasibility study assessments. They also organized business trip to other areas where similar projects had been deployed.

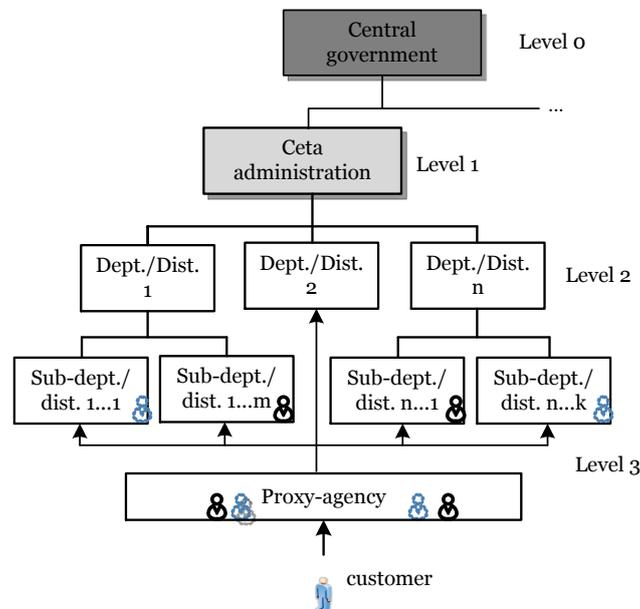


Figure 2. The new model for services at Ceta (CPS model)

This movement helped Ceta to facilitate their work as they were expected to deploy the new model, affecting numerous agencies and stakeholders. This was because the department leaders participated the project and provided project teams to solve different problems. It also helped that they were able to choose appropriate services for experimentations, later being standardized in their departments. This resulted they work focusing on the standardization of services. During that time, the project team also proposed a new model for public services (CPS). The model solved the problems of old model: for instance, earlier certain services were provided only by one agency. Now this agency became a proxy-agency, where employees come from related departments. Customers just have to go to a proxy agency for their services once (Figure 2). The PM stated, *“This [CPS] model not only differs from the old model, but it also differs from some recent electronic government models. For example, the model of ‘one stop government’ received the customers’ applications in administrative section, and then they transfer the application to other departments and agencies. On the other hand, [our model] received and processed applications at CPS, that is, instructing, checking, receiving, processing, deciding and returning the*

result at CPS. This means we eliminated 'intermediate' steps that just passed the applications from department and agency to other".

Those improvements and problems related to the organizational change (e.g., services procedures changes, management changes) were identified and monitored by senior managers through the project team members and local leaders within organizations (e.g., senior managers, department leaders). Their activities were influenced by legislations and policies from the central government related to using ICT in state agencies

From June 2013 to March 2014, Ceta established four CPS in four departments (Level 2), one in the administration central (Level 1) and published 457 services (Table 2). At CPS, all procedures and services protocols were monitored by a civil servant in charge. All services were put online and senior managers were able to manage every step of each application. On the customers' side, they were now had to only one CPS for their service. An enterprise architect articulated, "Our management activities for service provision completely changed with CPS. First, our new slogan in CPS is 'services provision with highest citizen satisfaction'. It indicates that our staff have to change their attitude, improve professional skills, and gain training carefully. Second, now citizens can directly assess the person-in-charge of their applications. Third, top officials are able to know the status of every application at any time. They also know the status of each departments or sections so that they can make appropriate decisions or solutions". This indicates that the change management activities are significantly different in comparison to previous model. The changing processes received positive feedback from the citizens. However, the department employees did not welcome the new model. This was because they perceived the chances of losing their jobs increased as the new model required less manpower than the old one. This became emphasized as all activities related to the citizens' applications were recorded so that the responsible person (e.g., managers) were able to control every action (e.g., monitoring and managing the processes). The data analysis revealed that those problems were solved by the department leaders. For instance, employees were moved to other sections or even laid off if their performance and customer satisfaction did not meet the expectations.

The new model received positive responses from both customers and leaders. As a result, the number of CPS expanded to 15 and number of services to 965. The model become an example in Vietnam in terms of how to use IT in the state agencies to support administrative procedure reform, improve effectiveness and efficiency in organizational operations, and increase transparency of the public sector. The project report summarized this as, "*CPS in central administration processed 38.890 applications within the on-time-rate almost 99%. 14 CPS in the departments processed 110.280 applications and their on-time-rate was more than 98%... The time to process the applications reduced 70% in comparison to previous model. For example the applications in investment certifications reduced from 25 working days to 7-10 days, application in the place of investment reduced from 40 working days to nine days*". In that sense, the EA project contributed to organizational change in ways that the organization provides their services and communicates with their customers. It also helped in significantly improving the management style in the state agencies with a move from distributed to centralized, monitored and controlled operations.

On 28 October 2015, the Prime Minister approved the CPS model. This means the process change was legitimized and approved. This is an important achievement because the model not was applicable not only in Ceta, but also possible for all provinces across the country with similar administrative structures, political system, and services. In the end of the day, it could affect more than 90 million people. In this sense, it caused a "revolution" for using an IT project as a tool for administrative reform. Part of the success can be explained that the model combines both business and IT perspectives with the organization's management structure. It changed the administrative procedures and services completely as stated by CIO: "the EA project is an unprecedented project in the sense that it helped [Ceta] to successfully reform [their administrative] procedures and the way to provide [public] services. The product of the project was approved by the Premier Minister, which rarely happens".

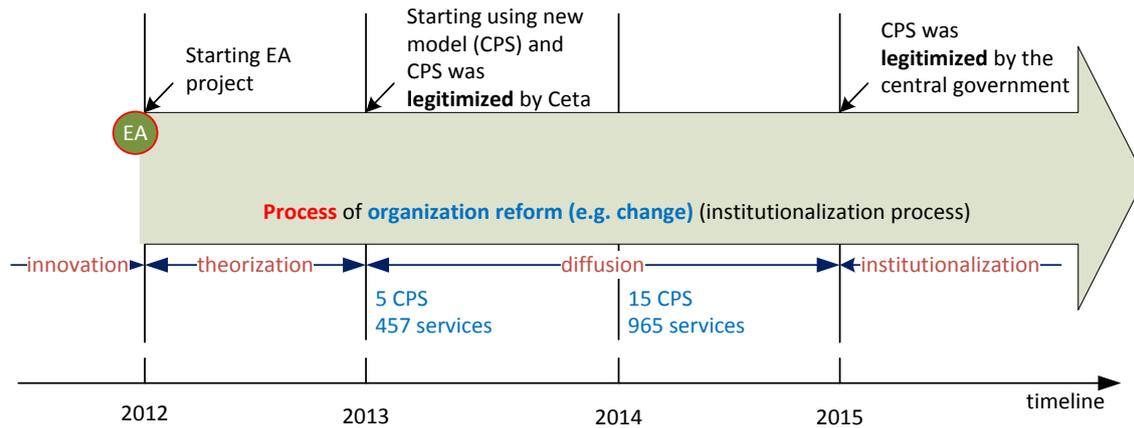


Figure 3. The timeline of the project and the stage of institutionalization

Figure 3 summarizes the EA project activities, and maps them with the stages of institutionalization during the organizational change. Four main stages appear in the Ceta's EA project; innovation, theorization, diffusion, and institutionalization. Deinstitutionalization stage is missing because a certain structure need to be in use for a period-of-time before being deinstitutionalized. Next we will discuss these in details.

Discussion

In this section, we will discuss the process of organizational change through the EA project and examine how those change activities are influenced by different institutional factors. We exclude the analysis of the model to future research because of space limitations.

Institutional Pressures and Organizational Change through EA Project

As discussed earlier, formal regulations and policies were not driving the change as the governmental instructions urged for improvements, not giving details how to do those. For example, Ceta chose EA as an approach to assist organizational reform. This was because at the time (September 2012), there was no laws or policies related to EA or its implementation. However, some indirect policies indicated that the state agencies need encouragement for using IT applications in their operations and businesses in order to increase effectiveness, efficiency and transparency. In addition to this, the central government had a master plan on IT applications which set objective for the future. As a result, many local governments proposed new IT projects in response to those policies. Yet they tended to mimic other and adopt similar approaches when they proposed the projects (c.f. Scott, 2005). For example, most local governments used traditional IT approaches such as purchasing individual software for managing electronic documents, upgrading a web-portal or digitalizing services. There they focused on IT rather considering business perspective. Some chose EA approach with a focus on both business and technology to reform their services and procedures similarly to Ceta. All these endeavors can be seen as responses to the master plan from the central governments, as their ultimate aim was to secure resources.

The decisions in Ceta were the results of regulative pressures from formal and informal regulations and policies portrayed in the master plan (c.f. Powell & DiMaggio, 1991). In particular, those policies influenced and drove the changes and choosing EA as an approach to reform administrative procedures and business services. Important decision makers are senior managers, who acted locally as forms of regulative pressures. That is, they played an important role in choosing the scope of project (e.g., covering both business and technology), selecting departments for the first CPS models of services and the way in which they reformed services procedures. Local leaders in departments enforced their employees to adopt the new approach. These insights evidently indicates the importance of the top managers in the process of change. This parallels with literature on the context of IT adoption and top management commitment, support and participation on the project (Zheng et al., 2013; Teo & Pian, 2003; Yoon & George, 2013; Krell et al., 2009; Liang et al., 2007).

The model caused changes in the organizations' cultures and values as cognitive-culture pressures were strong. They drew especially after Ceta used new model for their services successfully in 2013 and

expanded it in 2014 (Table 2). This resulted in several kinds of changes. First, the image of the Ceta changed and got diffused especially within the departments that had deployed CPS. With the slogan “*services provider with highest citizen satisfaction*”, the customers got only one access point and one slot so that the inconveniences with poor quality services or practical arrangements diminished. A report stated that “... *more than 98% of citizen and enterprises are satisfied with the services provided at CPS...*”. However, this change also generated challenges for employees applying CPS. *First*, especially elder people perceived it difficult to adapt and move to another sections or departments, or were afraid of losing their job. This was a great change because previously the government jobs were seen stable in comparison to private sector with regular job rotation. *Second*, they had to replace earlier “*ask-given approach*” where employees have high power, ‘lucrative benefits’ and chances to do illegal things, by new approach “*be ready to serve approach*” where everything is transparent and control with professionals relationship between civil servants. This increased the resistance to change and caused some employees to feel uncomfortable with CPS. As voiced by a civil servant, “*new model forced civil servants to work with more responsibility and transparency. Some felt they became less important for the organization. They have always wanted to compete with others in not only within CPS but also other CPS*”. In this case, the department leader had the responsibility to solve staff reductions and project objective problems.

Normative pressures, normally originating from other professionals organizations, initiated changes through the EA project. For example, consultants and professional associations (e.g., CIO committee, IT association) encouraged to choose the certain model, and modified it in accordance with Ceta’s characteristics. As enterprise architect stated, “we went to business trips to several places before we proposed the CPS model. We chose advance features from Singapore [electronic government] and Guangxi [a province of China], and then modified those features to fit with [our] environment, social and political context”. These professional communities played an important role on *how new approaches or proposals are approved by the organization, and how they become legitimated*. This influence was due to professional groups constantly interacting with the organizations. The professional groups also helped the organization to increase compliance with (pragmatic) standards, activities, and behaviours by training, granting or obtaining certificates, or organizing seminars or press conferences at Ceta. These provided means for the EA project so that their reputation and credibility increased, their activities were taken for granted and spread to others (c.f. Tolbert & Zucker, 1996). Moreover, technical people [at Company X] had the power of choosing the technology for software that was needed in CPS model – Ceta had chosen the company with well-known platform. This is in line with literature that IT professionals play a significant role in legitimating change (Greenwood et al., 2002). However, in Ceta, the technology seemed not to be playing an important role in organizational change as the EA project focused more on business perspectives.

EA Institutionalization Process and Organizational Change

Previous section discussed the isomorphic change, that is, organizations mimicking others or their structures, procedures, and approaches through cognitive-culture and normative pressures. Next, we will focus on non-isomorphic change, which is the process of change in organization through EA project activities and its relations with stakeholders.

How the organization started to change under the EA project

The change can start by social upheaval, technology change, market forces, or legislation change (Tolbert & Zucker, 1996; Greenwood et al., 2002). Although those factors seemed not to appear in Ceta, they however appeared in some forms of legislation. *First*, the legislation related factors may influence the organization when deciding to choose the EA as an approach for reform administrative procedures and services. This was the case in Ceta where the project proposal referred to two legislations; master program and master plan. However, these documents did not make any statements that the organizations have to use EA – as discussed earlier. *Second*, market force seemed not to be a source of the change at first phase. However, later, when Ceta was referred to as an example of successful CPS implementation, Ceta was constantly referred: “[...] *the objectives is that Ceta becomes the leading local government [top 10] in using and development IT application in operation [...]*”. This quotation refers to one of the most prominent indexes in Vietnam (e.g., Vietnam ICT index), providing measures of the ICT application use in the state agencies (e.g., local governments, ministries and equivalent agencies) and state-own enterprises. Table 3 shows how Ceta has developed from 2012 to 2015 in terms of VN ICT index. Below-average region has become above-average region.

	2012 (project start)		2015 (project finish)	
	Ceta	Local government standing 10 th	Ceta	Local government standing 10 th
VN ICT index	14 th	10 th	8 th	10 th

Table 3. The ranking of Ceta in VN ICT index in 2012 and 2015

Third, there is a strong evidence that senior managers and leaders play important roles as forms of regulative pressures driving and influencing organizational change as being the sources of innovations at innovation stage in the institutionalization process.

The diffusion and institutionalization stage under EA project

The diffusion of new institutions started with new structures that was legitimized at Ceta (from local scope to broader). 457 services in 5 CPS were legitimized in June 2013, and 15 CPS and 965 services in operation in March 2014 (see Table 2 earlier). This indicates that the new model is more advanced in comparison to old one. This was confirmed as more than 98% of citizens and enterprises were more satisfied with the services in CPS, and service times were reduced significantly. This also shows that successful theorization solves exactly those problems that previous model faced. In Ceta this was done successfully. This finding is supported by Greenwood et al. (2002:60) as, “*diffusion occurs only if new ideas are compellingly presented as more appropriate than existing practices*”.

Institutionalization started when CPS was recognized by the central government. This became significant as CPS model not only impacted millions of people directly and indirectly in Ceta, but it may be applied in other local governments, perhaps even in the countries. This indicates that the EA project not only had an impact to a certain organization, but also indirectly influenced the whole nation.

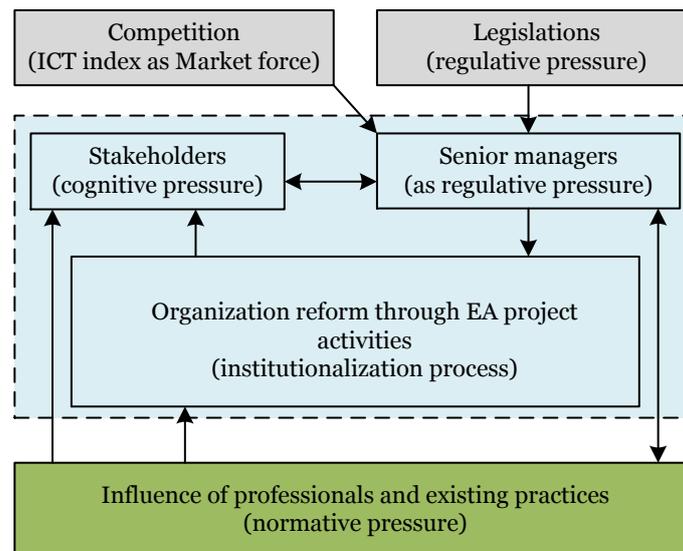


Figure 4. Factors influence organizational change through EA project

Aggregating all these insight together provides understanding about the organizational change process in Ceta. Figure 4 illustrates the overview of the changes in the organization utilizing the EA project, and institutional factors influencing the institutionalization process. First, ranking of IT application use in the state agencies (e.g., the nation-wide ICT index) acts as a market force. This drove the senior managers' decision to improve the current situation in Ceta (e.g., their administrative structures and services). They set a project as a means to improve Ceta's ranking. Second, legislation related to the use of information systems as a means of reforming administrative procedures and organization operations influenced the senior managers to choose the EA approach as the project. These factors; competition and legislation, can be categorized as *external pressures* and the sources of innovation in the institutionalization process (Figure 3). Third, senior managers act internally as *regulative pressure* forcing the organization to change and setting the directions of change. Moreover, the interplay between senior managers and different stakeholders creates *cognitive-culture pressure*, and influences the project activities and the stakeholders' behavior, helping or hindering the change. Finally, professional

groups, as *normative pressure*, influence the stakeholders and senior manager and their activities and behaviors, and indirectly impacts on the change. They also influence the change directly through the memberships of professional groups participating in the project or selecting the technologies for the operations, in this case for CPS.

Conclusions

This study analyzes the relation between the EA project and organizational change initiative through the analysis of external and internal pressures on the project activities. We provide understanding about how the project activities influence the organization change and, on the contrary, how institutional factors influence the changes through the EA project. For example, we analyzed the process of establishing, diffusing and institutionalizing a new service model (CPS) in Ceta, and how it becomes legitimated and diffused from local government to the central government. Despite utilizing qualitative research approach with insights only from one case, this study is one step in understanding how new ideas become taken-for-granted during the process of institutionalization. We contribute to research by providing in-depth understanding and insights of how the institutional factors impact the organizational change through EA. In particular, we provide insight into how internal and external pressures influence organizational changes and their stages, including innovation, theorization, diffusion, and institutionalization. We also provide understanding on how organizational structures are shaped, diffused, and institutionalized in an organization. This study thus extends the literature on institutionalization, especially focusing on micro level and its processes (Mignerat & Rivard, 2009; Weiss et al., 2013) since previous studies have mainly focused on institutionalization of technology innovation (Swanson & Ramiller, 1997; Avgerou, 2000), challenges in institutionalizations (Iyamu, 2009), and institutional factors related to effectiveness on the institutionalization in relation to effectiveness (Aier & Weiss, 2012; Weiss et al., 2013).

We also contribute to practice by providing a holistic view on the factors that may influence the changes in organizations. This also stresses the importance of the leaders, ranging from senior managers to local leaders in the departments, and especially their role in solving the problems of the stakeholders with negative attitudes. The leaders also play an important role in how the institutionalization stages impact on organizational culture and values. Our study shows how professional groups interact with senior managers and their decision-making, affecting, if not even steering, the direction of change, for example through technology selection.

A single case study could lead to bias even the research protocol was carefully designed. This obviously urges for more research in broader set of cases: in different countries, cultures, and contexts. For example, future research can utilize our findings in analyzing and comparing them to countries where EA is mandatory – such as Finland or U.S. From this perspective, our model in Figure 4 can be a starting point of broader set of qualitative studies or a basis for theoretical model used in quantitative research. Future research can also focus on different angles (e.g., sectional changes, sub-section), stakeholders' roles and behaviors in institutionalization stages by involving to longitudinal case study.

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Reference

- Aanestad, M., Jolliffe, B., Mukherjee, A., & Sahay, S. (2014). Infrastructuring Work: Building a State-Wide Hospital Information Infrastructure in India. *Information Systems Research*, 25(4), 834-845.
- Aier, S., & Weiss, S. (2012). An Institutional Framework for Analyzing Organizational Responses to the Establishment of Architectural Transformation, *The 20th European Conference on Information Systems (ECIS 2012), Barcelona: Paper 228*.
- Avgerou, C. (2002). The Institutional Nature of I.C.T. and Organizational Change. In C. Avgerou (Ed.), *Information Systems and Global Diversity* (pp. 23–49). New York: Oxford University Press.
- Avgerou, C. (2000). I.T. and Organizational Change: An institutionalist perspective, *Information Technology & People*, 13(4), 234–262.
- Azevedo, C. L. B., Sinderen, M. v., Pires, L. F., & Almeida, J. P. A. (2015). Aligning Enterprise Architecture with Strategic Planning. In A. Persson & J. Stirna (Eds.), *Advanced Information Systems Engineering Workshops* (pp. 426-437). Stockholm, Sweden: Springer International Publishing.
- Cousins, K. C., & Robey, D. (2005). Human agency in a wireless world: Patterns of technology use in nomadic computing environments. *Information and Organization*, 15(2), 151-180.
- Dacin, M. T., Goodstein, J., & Scott, W. R. (2002). Institutional theory and institutional change: introduction to the special research forum. *The Academy of Management Journal*, Vol. 45, 45-56.
- Dang, D. D. (2017). *Enterprise Architecture Institutionalization: A Tale of two cases. Proceedings of the 25th European Conference on Information Systems (ECIS'2017)*, Guimarães, Portugal.
- Dang, D. D., & Pekkola, S. (2016a). Institutionalising enterprise architecture in the public sector in Vietnam. *Proceedings of the 24th European Conference on Information Systems (ECIS'2016)*: Istanbul, Turkey. Association for Information Systems.
- Dang, D. D., & Pekkola, S. (2016b). Root causes for enterprise architecture problems in the public sector. *Proceedings of the 20th Pacific Asian Conference on Information Systems 2016 (PACIS'2016)*, Chiayi, Taiwan. Association for Information Systems.
- Dang, D. D., & Pekkola, S. (2017a). Problems of Enterprise architecture Adoption in the public sector: Root Causes and some solutions. In L. Rusu & G. Viscusi (Eds.), *Information Technology Governance in Public Organizations Theory and Practice*: Springer.
- Dang, D. D., & Pekkola, S. (2017b). Systematic Literature Review on Enterprise Architecture in the Public Sector. *Electronic Journal of e-Government*, 15 (2).
- DiMaggio, P. J., & Powell, W. W. (1983). The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields. *American Sociological Review*, 48(2), 147-160.
- Forman, C., King, J. L., & Lyytinen, K. (2014). Special Section Introduction—Information, Technology, and the Changing Nature of Work. *Information Systems Research*, 25(4), 789-795.
- Gosain, S. (2004). Enterprise Information Systems as Objects and Carriers of Institutional Forces: The New Iron Cage? *Journal of the Association for Information Systems*, 5(4).
- Greenwood, R., Suddaby, R., & Hinings, C. R. (2002). Theorizing Change: The Role of Professional Associations in the Transformation of Institutionalized Fields. *The Academy of Management Journal*, 45(1), 58-80.
- Hjort-Madsen, K. (2006). Enterprise Architecture Implementation and Management: A Case Study on Interoperability, *Proceedings of the 39th Hawaii International Conference on System Sciences (HICSS-39)* (pp. 71c (71-10)). Kauai: Computer Society Press.
- Hjort-Madsen, K. (2007). Institutional patterns of enterprise architecture adoption in government. *Transforming Government: People, Process and Policy*, 1(4), 333-349.
- Hjort-Madsen, K., & Götze, J. (2004). *Enterprise Architecture in Government - Towards a Multi-Level Framework for Managing IT in Government*. Paper presented at the Proceedings of ECEGO4, Dublin, Ireland.
- Hjort-Madsen, K., & Pries-Heje, J. (2009). Enterprise Architecture in Government: Fad or Future?, *Proceedings of the 42nd Hawaii International Conference on System Sciences (HICSS-42)* (pp. 132 (131-110)). Waikoloa, Big Island, Hawaii.
- Iyamu, T. (2009). *The Factors Affecting Institutionalisation of Enterprise Architecture in the Organisation*. Paper presented at the IEEE Conference on Commerce and Enterprise Computing (CEC '09), pp. 221-225.
- Janssen, M., & Hjort-Madsen, K. (2007). *Analyzing Enterprise Architecture in National Governments: The Cases of Denmark and the Netherlands*. Paper presented at the Proceedings of the 40th Hawaii International Conference on System Sciences, 218a.

- Jepperson, R. L. (1991). Institutions, Institutional Effects, and Institutionalization. In W. W. Powell & P. J. DiMaggio (Eds.), *The New Institutionalism in Organizational Analysis* (pp. 143–163). Chicago: University of Chicago Press.
- Kaushik, A., & AparnaRaman. (2014). The new data-driven enterprise architecture for e-healthcare: Lessons from the Indian public sector. *Government Information Quarterly*, Volume 32, Issue 1, January 2015, Pages 63-74.
- Klein, H. K., & Myers, M. D. (1999). A Set of Principles for Conducting and Evaluating Interpretive Field Studies in Information Systems. *MIS Quarterly, Special Issue on Intensive Research*, 23(1), pp. 67-93.
- Krell, K., Matook, S., & Matook, F. (2009). The Effects of Regulatory Pressure on Information Systems Adoption Success: An Institutional Theory Perspective, *European Conference on Information Systems (ECIS)*.
- Kuipers, B. S., Kickert, W., Tummers, L., Grandia, J., Voet, J. v. d., & Higgs, M. (2014). The Management of Change in the Public Organizations: A Literature Review. *Public Administration*, 92(1), 1-20.
- Leonardi, P. M. (2014). Social Media, Knowledge Sharing, and Innovation: Toward a Theory of Communication Visibility. *Information Systems Research*, 25(4), 796-816
- Liang, H., Saraf, N., Hu, Q., & Xue, Y. (2007). Assimilation of Enterprise Systems: The Effect of Institutional Pressures and the Mediating Role of Top Management. *MIS Quarterly*, 31(1), 59-87.
- Magnusson, J., & Nilsson, A. (2006). Infusing an architectural framework with neo-institutional theory: reports from recent change management initiatives within the Swedish public administration, *Proceedings of the 39th Annual Hawaii International Conference on System Sciences*.
- Magoulas, T., Hadzic, A., Saarikko, T., & Pessi, K. (2012). Alignment in Enterprise Architecture: A Comparative Analysis of Four Architectural Approaches. *Electronic Journal Information Systems Evaluation*, 15(1), 88-101.
- Mani, D., Srikanth, K., & Bharadwaj, A. (2014). Efficacy of R&D Work in Offshore Captive Centers: An Empirical Study of Task Characteristics, Coordination Mechanisms, and Performance. *Information Systems Research*, 25(4), 846-864
- Meyer, J. W., & Rowan, B. (1977). Institutionalized Organizations: Formal Structure as Myth and Ceremony. *American Journal of Sociology*, 83(2), 340-363.
- Mignerat, M., & Rivard, S. (2009). Positioning the Institutional Perspective in Information Systems Research. *Journal of Information Technology*, (24:4), pp. 369-391.
- Myers, M. D. (2009). *Qualitative Research in Business and Management*. London, UK: SAGA.
- Nordheim, S., & Pääväranta, T. (2006). Implementing enterprise content management: from evolution through strategy to contradictions out-of-the-box. *European Journal of Information Systems*, 15, 648–662.
- Oliver, C. (1991). Strategic Responses to Institutional Processes. *Academy Of Management Review*, 16(1), 145–179.
- Orlikowski, W. J., & Barley, S. R. (2001). Technology and Institutions: What can research on information technology and research on organizations learn from each other? *MIS Quarterly*, 25(2), 145–165.
- Orlikowski, W. J., & Yates, J. (2006). ICT and Organizational Change A Commentary. *The Journal of Applied Behavioral Science*, 42(1), 127-134.
- Palthe, J. (2014). Regulative, Normative, and Cognitive Elements of Organizations: Implications for Managing Change. *Management and Organizational Studies*, 1(2), 59-66.
- Pishdad, A., Koronios, A., Reich, B. H., & Geursen, G. (2014). Identifying Gaps in Institutional Theory, *25th Australasian Conference on Information Systems*.
- Powell, W. W., & DiMaggio, P. J. (1991). *The new institutionalism in organizational analysis*. Chicago: University of Chicago Press.
- QD1605/QD-TTg. (2010). Master Plan for IT application for state agencies, 2011-2015 period. Hanoi.
- Ross, J. W. (2009). Information Technology Strategy-Creating a strategic IT architecture competency: Learning in stages. In R. D. Galliers & D. E. Leidner (Eds.), *Strategic Information Management: Challenges and Strategies in Managing Information Systems* (pp. 584): Routledge.
- Rukanova, B., Stijn, E. v., Henriksen, H. Z., Baida, Z., & Tan, Y.-H. (2009). Understanding the influence of multiple levels of governments on the development of inter-organizational systems. *European Journal of Information Systems*, 18, 387–408.
- Scott, W. R. (1995). *Institutions and Organizations Foundations for Organizational Science*: Sage.
- Scott, W. R. (2005). Institutional theory. In *Encyclopedia of Social Theory* (pp. 408-414): Thousand Oaks, CA: Sage.
- Simon, D., Fischbach, K., & Schoder, D. (2013). An Exploration of Enterprise Architecture Research. *Communications of the Association for Information Systems*, V ol. 32, Article 1.

- Simon, D., Fischbach, K., & Schoder, D. (2014). Enterprise architecture management and its role in corporate strategic management. *Inf Syst E-Bus Manage*, 12(5), 5-42.
- Stake, R. E. (2005). Qualitative Case Studies. In N. K. Denzin & Y. S. Lincoln (Eds.), *The SAGE Handbook of Qualitative Research 3rd edition* (pp. 443-466): Sage.
- Swanson, E. B., & Ramiller, N. C. (1997). The Organizing Vision in Information Systems Innovation. *Organization Science*, 8(5), 458-474.
- Teo, T. S., & Pian, Y. (2003). A contingency perspective on Internet adoption and competitive advantage. *European Journal of Information Systems*, 12, 78-92.
- Tolbert, P. S., & Zucker, L. G. (1996). The Institutionalization of Institutional Theory. In C. H. a. W. N. S.Clegg (Ed.), (Eds.), *Handbook of organization studies* (pp. 175-190). London: SAGE. (pp. 175-190). London: SAGE.
- Van de Ven, A. H. v. d., & Poole, M. S. (1995). Explaining Development and Change in Organizations. *Academy of Management*, 20(3), 510-540.
- VN. (2011). Resolution No. 30c/NQ-CP: Promulgating the Master Program on State Administration Reform in the 2011-2020 period. Hanoi.
- Volkoff, O., & Strong, D. (2013). Critical Realism and Affordances: Theorizing IT-Associated Organizational Change Processes. *MIS Quarterly*, 37(3), 819-834.
- Volkoff, O., Strong, D. M., & Elmes, M. B. (2007). Technological Embeddedness and Organizational Change. *Organization Science*, 18(5), 832-848.
- Walsham, G. (2006). Doing qualitative research. *European Journal of Information Systems* 15, 320-330.
- Walsham, G. (2009). *Interpreting Information Systems in Organizations*: Creative Commons Attribution 3.0 License.
- Wang, P., & Swanson, E. B. (2007). Launching professional services automation: institutional entrepreneurship for information technology innovations. *Information and Organization*, 17(2), 59-88.
- Weiss, S., Aier, S., & Winter, R. (2013). *Institutionalization and the Effectiveness of Enterprise Architecture Management*. Paper presented at the Thirty Fourth International Conference on Information Systems, Milan 2013.
- Winter, K. B., Sabine; Matthes, Florian; and Schweda, Christian M., (2010). *Investigating the State-of-the-art in Enterprise Architecture Management Methods in Literature and Practice*. Paper presented at the MCIS 2010 Proceedings. Paper 90.
- Yoon, T. E., & George, J. F. (2013). Why aren't organizations adopting virtual worlds? *Computers in Human Behavior*, 29, 772-790.
- Zheng, D. Q., Chen, J., Huang, L. H., & Zhang, C. (2013). E-government adoption in public administration organizations: integrating institutional theory perspective and resource-based view. *European Journal of Information Systems*, 22(2), 221-234.