UNDERSTANDING ORGANIZATIONAL AGILITY DEVELOPMENT FOR GOVERNMENT– A PROCESS MODEL OF RESOURCE CONFIGURATION

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Abstract
Organizational agility – the ability to sense change and respond quickly – has been regarded as an important index of organizational performance in rapidly changing environments. However, agility research has overlooked the dynamics of the resource configuration process which covers resource selection, acquisition, development, and management. Prior studies mostly treated it as a ready starting point to enable agility. This study seeks to conceptualize this dynamic resource configuration process. Based on a case of Shanghai Social Security Card System project, we inductively develop a process model of resource configuration and agility development. This model reveals how to configure IT resources and institutional resources to create agility. It contributes to the organizational agility literature by elaborating the dynamic resource configuration process embedded in the agility development process. Governments may derive strategies and tactics from our finding to help them configure IT and institutional resources to develop organizational agility.

Keywords: Organizational agility, Process model, Resource configuration, IT resources, Institutional resources.
1 INTRODUCTION

As political, economical, and societal environments become increasingly complex and turbulent, governments around the world have realized the importance of using IT to develop their organizational agility and to improve public service delivery to their citizens and businesses (Irani et al. 2007). Organizational agility – the ability to sense change and respond quickly (Overby et al. 2006) – becomes an important determinant of governmental performance (Dunleavy et al. 2003). The IT enabled agility and responsiveness of government in service delivery can help government better enhance simplicity and automaticity in routine operations, provide transparent and accessible public services, and monitor the risk environment (Dunleavy et al. 2003; Hackney et al. 2007).

While there is increasing appreciation that IT enables government to be more genuinely integrated, agile, and holistic (Gottschalk 2009), how the government dynamically develops IT enabled organizational agility remains unclear. Previous studies on organizational agility adopted the resource-based view and focused on properties of IT resources and capabilities (Overby et al. 2006). They assumed selective resources as a ready starting point for government to develop agility. However, they have not examined the dynamic process of resource configuration, that is, how government actually makes continuous resource choices in pursuit of organizational agility (Oliver 1997). In other words, they failed to demonstrate how the government configures relevant resources, not limited to IT resources, and translates them into organizational agility.

Acknowledging this critical knowledge gap, our study endeavours to provide an in-depth examination of the underlying process of resource configuration through which IT enhances government’s organizational agility. Using a case study of the Shanghai Social Security Card System in China, we draw special attention to the configuration process of two types of resources, i.e., IT resources and institutional resources. IT resources are one type of critical resources that stimulate and formulate the e-government project, while institutional resources are another type of key resources that regulate and effectuate the implementation of e-government project. By examining how IT resources and institutional are identified, developed, and consolidated for e-government projects, and opening the “black box” of the relationship between resource configuration and organizational agility, this study aims to underscore the evolvement of resource configuration in e-government projects, compliment the resource-based view with a resource configuration process, and serve as a useful reference for government agencies on how to derive organizational agility. Correspondingly, our research question is: how do the dynamic resource configuration process shapes government’s organizational agility?

The rest of the paper is structured as follows. First, we review the extant literature on organizational agility from the resource-based view. A case of the Shanghai Social Security Card system is then presented. This is followed by in-depth case analysis and discussion on the lessons we learn from this study. The last section summarizes and concludes the paper.

2 LITERATURE REVIEW

2.1 Organizational Agility

The resource-based view defines an organization as a bundle of productive resources and routines (Penrose 1959). The resource-based view emphasizes the role of resources in influencing organizations’ strategies and performances (Barney 1991; Penrose 1959). In specific, it is the valuable, rare, imperfectly imitable, and non-substitutable resources that drives organizational competitive advantages (Barney 1991). This view provides us with a reasonable lens to explain how government, as a public organization, configures and leverages key resources to develop organizational agility.

In the resource-based view, organizational agility is regarded as one prominent organizational capability. Organizational agility is defined as a set of organizational capabilities that allow an organization to effectively sense changes in the turbulent environment and respond to this change
through the constant alignment of assets and capabilities in a timely, efficient and cost-effective way (Goh et al. 2010; Mathiassen and Pries-Heje 2006; Sambamurthy et al. 2003; Seo and Paz 2008). It consists of two components: sensing and responding (Overby et al. 2006). Government, like other organizations, possess limited resources while confronting competition from peer organizations (Porter 1990). A government is in a better position to competitive performance if it has developed a set of organization capabilities that allows it to sense the environment and to respond to this intelligence by assembling assets and resources to enact a competitive action (Overby et al. 2006; Sambamurthy et al. 2003).

Moreover, in terms of the diversity of stakeholders, organizational agility is comprised of three parts: customer agility, partnering agility, and operational agility (Sambamurthy et al. 2003). Customer agility is the ability to leverage the voice of the customers for gaining intelligence and detecting competitive action opportunities (Kohli and Jaworski 1990). Partnering agility is the ability to leverage the assets, knowledge, and competencies of suppliers, distributors, contract manufacturers, and logistics providers through alliances, partnerships, and joint ventures (Venkatraman and Henderson 1998). Operational agility refers to the ability of business processes to accomplish speed, accuracy, and cost economy in the exploitation of opportunities for innovation and competitive action (Sambamurthy et al. 2003).

Drawing on real option theory, Sambamurthy et al. (2003) have further explained how organizational agility is developed by leveraging existing IT resources to create digital options (Sambamurthy et al. 2003). Digital options are a set of IT-enabled capabilities in the form of digitized organizational work processes and knowledge systems (Sambamurthy et al. 2003). In particular, Sambamurthy et al. (2003, p. 248) have defined four types of digital options: (1) digitized process reach refers to the extent to which a firm deploys common, integrated, and connected IT-enabled processes; (2) digitized process richness describes the quality of information collected about transactions in the process, transparency of that information to other processes and systems that are linked to it, and the ability to use the information to adapt or reengineer the process; (3) digitized knowledge reach refers to the comprehensiveness and accessibility of codified knowledge in an organization’s knowledge base and the interconnected networks and systems that enhance interactions among individuals for knowledge sharing and transfer; and (4) digitized knowledge richness refers to IT-based systems of interactions among organizational members to support their sense-making, perspective-sharing, and development of tacit knowledge.

Although agreeing on Sambamurthy et al.’s (2003) model of agility development process, we argue that they have neglected a resource configuration process that is embedded in the agility development process. Some studies also pointed out that there is a missing link between the internal resource configuration and the strategic competitive advantage (Borch et al. 1999). We believe that besides leveraging resources to shape organizational agility, an organization should possess the know-how of which resources are key building blocks and how to configure these resources. Therefore, by building a process model, our study aims to identify what the resource configuration is, how it goes, and how it leads to organizational agility.

2.2 Resource Configuration and Major Resources

In this study, the resource configuration is defined as the dynamic process of resource selection, acquisition, development, and management in order to achieve a better resource portfolio. In the resource configuration process, different kinds of resources may interplay with each other, and complement each other to shape organizational agility. For agility development of government, two types of resources are the most prominent ones among all resources: IT resources and institutional resources.

IT resources have been identified as one important type of resources in weaving organizational agility (Overby et al. 2006). IT resources refer to the IT assets and capabilities that are available and useful in detecting and responding to market opportunities or threats (Wade and Hulland 2004). Major IT
resources include external relationship management, market responsiveness, IS-business partnerships, IS management/planning, IS infrastructure, IS technical skills, IS development, and cost efficient IS operations (Wade and Hulland 2004). Idiosyncratic IT resources help an organization to sense and respond to the rapidly changed environment.

Institutional resources are another important type of resources for agility development of government because e-government projects involve institutional changes that require corresponding institutional preparation. Institutions are the humanly devised constraints that structure human interaction (North 1990). They are made up of formal constraints (rules, laws, constitutions), informal constraints (norms of behavior, conventions, and codes of conduct), and the effectiveness of their enforcement (North 1990). Institutional resources are assets and capabilities that are available and useful for institution development. By enforcing formal and informal constraints, institutional resources help to reduce uncertainty, provide meaning, and reduce transaction costs (North 1990; Scott 2008). Major institutional resources include political concept and beliefs, formal rules, informal rules, and organizational structures (Kingston and Caballero 2006; Oliver 1997).

3 RESEARCH METHODOLOGY

Since our study aims to examine how the resource configuration process leads to agility development, case study method was adopted. In particular, we followed the approach of “soft positivism” (Kirsch 2004; Madill et al. 2000). A case of e-government project, called Shanghai Social Security Card system, was chosen because (1) Shanghai government has been regarded as the most agile public organization among China’s municipalities, (2) Shanghai government has benefited from many e-government projects, and (3) the project of Shanghai Social Security Card system presented a long-time and sustaining resource configuration process.

We gathered both primary and secondary data. Primary data were collected from retrospective and semi-structured interviews. During three months in year 2005 (June-August), we made field visits to two government agencies in charge of the project: the Shanghai Social Security Bureau and the Shanghai Municipal Informatization Commission. We also arranged rounds of personal interviews with people from all ranks of Shanghai’s government and across multiple agencies. In all, our field interviews with all major stakeholders yielded 36 interviews. In particular, we interviewed people from Shanghai Labour and Social Security Bureau for 80 hours, and interviewed those from Shanghai Municipal Informatization Commission for 120 hours. Eight interviews were conducted with the Vice Director of Shanghai Informatization Office and former executive mayor. We also interviewed the Vice Chair of Shanghai congress and the Vice Director of Shanghai Labour and Social Security Bureau. In these interviews, government officials generated details on resource allocation during the project, guaranteed the quality of data, and further introduced us to key informants from different agencies. Notes were taken after each interview, for the purpose of summarization of the emerging themes and issues.

Secondary data were collected from reports of both central and municipal governments, detailed project documentation, and online media (e.g., the Shanghai government website). These secondary data sources played a crucial role in establishing triangulation and in maintaining the chain of evidence (Winter 2003).

The data analysis was conducted based on the case database of field evidence that included both primary data (i.e., interviews and notes of observations) and secondary data (i.e., web documents, internal documents, published book series, and multimedia material). First, detailed case description of the entire project process was first prepared. Next, we created a list of critical events, including the founding of the new government agency, initiation of certain parts of the system, and problems in the system implementation. We identified mechanisms and sub-processes by examining how the Shanghai government managed to provide social security services to its residents. We also iteratively verified our data by cross-checking it from multiple sources, after which we created a chain of evidence. Finally, in order to verify and clarify our understandings, we conducted an additional round of field
visits and interviews with key informants in July 2006. This highly iterative process ended when saturation was reached, with no new data further explained the process of e-government implementation.

4 CASE DESCRIPTION ON SHANGHAI SOCIAL SECURITY CARD SYSTEM

Shanghai, the largest megalopolis in China, is also the international economic, financial, trade and shipping centre in the country. Due to the constant inflow of people from other parts of the country, the population in Shanghai keeps growing (Shanghai Municipal Government 2011). When Shanghai was liberated in 1949, it had a population of 5.2 million. By the end of 2008, the figure rose to 13.9 million, or 1% of China’s population (Shanghai Municipal Government 2011). The explosion of population, together with the fast-changing international business environment, keeps calling for a more agile municipal government to sense businesses’ and citizens’ needs and respond to them quickly.

Clearly noticing the need to advance its public services, the Shanghai municipal government makes great effort to build the city into a pioneering e-city with the help of IT. The Shanghai municipal government is well known for its e-government initiatives in China, especially in the aspect of citizen services. However, if we look back into the early 1990s, the citizen services in Shanghai were performed by several rudimental stand-alone information systems. Only one basic online presence (www.shanghai.gov.cn) was set up. Those un-synergized systems were initiated by different agencies, and did little more than each agency’s self automate back-office processes. That led to inconsistent information and inefficient citizen service quality.

At that time, the central government of China just began to realize the importance of e-government. It actively promoted the use of IT in the public sector, and asked municipal governments to develop their own e-government strategies according to varied needs and demands. The Shanghai municipal government sought to tap onto these strategies to minimize inefficiency due to disparate e-government initiatives by its different agencies, and to strengthen the municipality’s position in China’s transformation. It aimed to push for a more dynamic and interactive system of social security services, as a start of the citizen service system.

In 1998, in response to the Shanghai government’s emphasis on citizen services, eight agencies in Shanghai submitted individual proposals for their separate cards. The Shanghai government realized the handicaps of fragmented systems in providing agile and seamless citizen services. It rejected the individual proposals from the eight agencies, and conceived to develop a municipality-wide smart card.

After thoughtful consideration, on 21st September 1998, Shanghai municipal government made a decision and laid out a three-year time frame for an integrated social security card project. This all-in-one smart card would record key personal information (e.g. name, identification number, fingerprint, medical insurance account number, housing fund account number, etc.), and enable citizens to access a wide variety of public services. Although this card is called the Social Security Card, its functionalities extended beyond merely social security related services. It was planned to cover social security, public security, civil administration, medical insurance, housing fund, and others.

The project of Social Security Card system could be divided into three phases (see Figure 1): initiation and development, implementation, and popularization. In the initiation and development phase, the Shanghai municipal government set up a project team was set up and authorized the team to manage the project. The project team partnered with a chip maker and a research institute. It held regular meetings with representatives from various agencies to discuss and finalize the system design. Later, the Shanghai municipal government founded another administrative institution to manage the system. Back-office process reengineering was made to integrate the operational processes among agencies.

In the implementation phase, the Shanghai government created institutional resources (e.g., organizations and policies) according to the system’s needs. A third administrative office was set up to
oversee the project implementation. Two special information policies were enacted to ensure that the IT system could function well. In these policies, the roles and responsibilities of the government agencies were clarified to help each agency know how to interact and collaborate with each other. Broad-based training was held for government agencies, hospitals and citizens to create new norms of behaviour. Many informal channels (e.g., TV, banners at shopping centres) were included to cultivate norms in citizens. Many issues of citizen knowledge transfer and sharing among multiple parties were articulated explicitly by these policies and norms.

In the popularization phase, the Shanghai government used extensive IT resources (human capitals as well as service centres) to facilitate the system to run well in the whole city. Over 2000 service centres were set up all over Shanghai to make the service convenient to citizens. IT resources, together with institutional resources, routinized the system into the society.

As a major benefit, the system enabled a more transparent citizen service. Moreover, this system enabled citizens in Shanghai to conduct social security-related transactions very conveniently. The Shanghai municipal government has won high citizen satisfaction because of its fast and efficient response. Other Chinese municipalities and provinces regarded Shanghai’s project as a model and replicated this project and implemented similar systems. The success of this project was of strategic importance to Shanghai. Shanghai’s proactive participation in e-government garnered additional privileges over other Chinese cities in terms of future resource allocation by the central government.

5 A PROCESS MODEL OF RESOURCE CONFIGURATION

A model of how organizational agility is created through the resource configuration process was constructed iteratively (Figure 2). It was constructed by analyzing the case and comparing our findings with the extant literature on organizational agility. This section will discuss the process and three findings emerging from the case in details.
5.1 The Initiation and Development Phase

In the initiation and development phase, the case revealed that IT resources worked as an initiator to trigger the institutional resource configuration process. Prior to 1998, when the Shanghai government was using several separate systems to provide citizen services, the top management in the Shanghai government agencies sensed the weaknesses of institutional development. No institutional framework at that time could ensure fast and efficient services to citizens. The top management of Shanghai government began to invite IT experts in the government and discuss the potential to advance institutional resources by leveraging IT capabilities. They believed that IT could do more than connections. They built a holistic view of available technology as a basis for envisioning potential new patterns of development in digitization. IT capability (i.e., the potential of IT development and available technologies) kindled a spark of attention from the government to bring in new institutional resources for great changes. Without such IT capability, the government would not be able to configure institutional resources in an efficient way to build better institutions for the society.

The case showed that several institutional resources have emerged in response to IT resources to initiate the project. First, IT resources sparked the government’s strong political will to conduct e-government initiative. They hoped that this e-government initiative would provide fresh new impetus to the municipality’s economy and strengthen their position as a leader in China’s transformation. As one informant noted:

“Shanghai is the commercial centre of China. We hope to take the lead in the country-wide endeavour of digitization. We aim to draw further attention from the central government through showcasing our significant achievement. This will put us in an advantageous position in the competition for resources against other provinces and municipalities.”
Not only the municipal government’s political will but also the central government’s political will was kindled by this e-government initiative. This project caught the attention of the central government, who was seeking to further computerize China’s social security system. Thus, in September 1999, China’s Ministry of Labour and Social Security announced that they would collaborate with the Shanghai government in this area. The political will from the central government acted as an important institutional resource. It enabled the Shanghai government to leverage more institutional, intellectual and financial resources with the authority of the China’s central government. As an informant noted:

“Engaging and sustaining government attention is crucial for a mega-project like this one... Government support in the forms of financial resources and institutional endorsement makes the project move forward.”

Second, the smart card project received strong support of informal and formal institutional resources from the Shanghai government. Informal institutional resources, such as top management’s personal attention, were fairly salient. As a key government project, this initiative received personal attention from the mayor of Shanghai. The mayor facilitated the development of a strong connection between administration and IT at the executive level, and leveraged this connection to achieve a shared vision for IT (Feeny and Willcocks 1998). In China, the personal attention of top management in government could not be neglected because China’s culture of Confucianism emphasizes on the social norms to comply with seniors. As a result, government workers perceived high subjective norms to provide available resources to ensure the project’s success. It is thus pivotal that IT resources have triggered the personal attention of top management in government.

Formal institutional resources, like organizational structure with authority, were also acquired immediately as a response to the calling of IT resources. The project required corresponding organizational structures to be authorized to conduct necessary institutional changes. The smart card project was decided to be championed by the Shanghai Municipal Informatization Commission, who reported directly to the vice mayor in charge of municipal development. The commission was authorized with a great power. It was empowered to coordinate the efforts of five other government agencies: the Shanghai Labour and Social Security Bureau, the Shanghai Municipal Bureau of Public Security, the Shanghai Municipal Bureau of Civil Affairs, the Shanghai Municipal Medical Insurance Bureau, and the Shanghai Municipal Public Health Bureau. Besides, the Shanghai government also established and empowered a project team to handle this initiative, partnered with a chip maker and a research institute to set up the technological infrastructure. It also helped to build a regulatory framework, and educate citizens to prepare for a smooth transition to a new service delivery mode. In addition, in 1999, given the scope and complexity of the project, another administrative institution – the Shanghai Security Card Centre – was set up and devoted to managing the system.

The case also reveals that IT resources have invoked formal institutional resources among agencies to support the system development. The project champion initiated regular meetings with representatives from various agencies to discuss their operational processes and problems. Through this process, agreements were reached on several key issues, including the overall system design, plan for an administrative institution, design of the regulatory framework, and channels of information collection.

All these above institutional resources were configured to echo IT resources’ calling in the initiation and development phase. Political will, as the first emerging institutional resource, has enhanced the availability of other institutional resources. Other informal and formal institutional resources have ensured that the project team had access to any resources and support of agencies at different levels throughout the Shanghai government.

When these institutional resources were put together into the production of IT system, they assured digital process reach for the government. Here, high digital process reach is associated with processes that tie activities and information flows across agencies and other partners (e.g., hospitals). For example, in several rounds of brainstorming and following review sessions, the mayor and vice mayor, who were the project sponsors, sought to forge consensus among the various agencies to amend their back-office processes in line with the agreed upon functionalities of the social security card. Thus, the
project team was able to translate the key agreements into actable directives, and propose solutions and make action plans to develop an integrated process. Based on the synergized process, intra-organizational and inter-organizational work processes have been designed for automated, informatized, and integrated activities. Finally, the project team built a central system by seamlessly integrating major citizen service subsystems (see Figure 3).

![Citizen Service Information System](image)

**Figure 3. The Subsystems of the Citizen Service Information System**

With the availability of connected processes, service transactions involving multiple distributed agencies could be conducted efficiently. This has increased the government's ability to accomplish speed, accuracy, and cost economy in response to its own operations among different agencies. Thus, this digital process reach has helped the government to realize operational agility.

Thus, our first finding is that:

*In the initiation and development phase, IT resources (e.g., IS management/planning, available IS technical skills, IS development, IS infrastructure) act as an initiator to call for corresponding institutional resources (e.g., political will, organizational structure, leader’s personal attention) to be prepared and assembled. These institutional resources that respond to IT resources’ claiming assure digital process reach. Based on such digital process reach, the government develops operational agility.*

### 5.2 The Implementation Phase

In the implementation phase, the case revealed that IT resources acted as a molder to shape the institutional resource configuration. A molder is a tool that shapes original materials into some specific molds. For example, when people make a china pot, their hands hold the rotating prototype and serve as the molder to shape the pot. However, the figure of the hands will also be fine-tuned by the prototype in order to align with the materials. This metaphor implies that IT resources could shape the formation of institutional resources, and also be adjusted to fit the development of institutions.

In March 2001, the Shanghai Municipal Informatization Commission set up a subordinate organization – the Administrative Office of Shanghai Social Security and Citizen Service Information System – to facilitate the implementation process. This administrative office created, structured, and allocated new formal and informal institutional resources according to the card system. Based on the operational requirements of the card system, the Administrative Office crafted two policies which laid down a set of guiding principles and practices as part of the legal and regulatory framework to facilitate project implementation and operation. One police, named as “The Administrative Method for Shanghai Social Security Card”, spelled out the roles and responsibilities of the government and citizens in using the card. This policy specified that:

*“The Administrative Office is in charge of the management of social security card in the whole city, while the Shanghai Security Card Centre is in charge of producing and disseminating the card. Other government agencies (e.g., social security, civil administration) should be responsible for*
effective usage and function development of the card in their units.”
(http://www.962222.net/htmlnews/20070511/130.htm)

Another policy, “The Administrative Method for Shanghai Social Security and Citizen Service Information System”, elaborated the roles and responsibilities of government agencies in charge of social security, civil administration, public security, housing fund, medical insurance and electronic security. This policy regulated that:

“The Shanghai Municipal Informatization Commission should lead other departments to discuss the information sharing agreement based on the information sharing need of the system. The commission should urge relevant departments to conduct it.”
(http://www.962222.net/htmlnews/20070801/131.htm)

Informal norms were also created along the formal regulation. Broad-based training was conducted among government agencies, hospitals, and citizens. Internal documents and newsletters were circulated in a top-down manner from the municipal government to its 19 county-level government divisions, to the 220 township-level government divisions, and finally to their 5430 village-level government divisions. No effort was spared in reaching the public, as multiple channels of communication were employed. As one informant recalled:

“We tried to introduce the new system to the public through TV, newspapers, banners at main streets and shopping centres, information booths at community centres, and an around-the-clock hotline. We tried to reach different user groups, and gain their trust and buy-in for the smart card system.”

Thus, based on the system needs, the Shanghai government created new formal institutional regulations and informal norms for the card system. Moreover, considering the scope and impact of the system, the project team also carefully crafted the implementation plan, which created a good institutional environment for the system implementation. The project team decided to choose an incremental approach for the system implementation. The social security cards were first launched in nine districts from the central urban area. To ensure a smooth rollout of this large-scale initiative, the project team decided not to activate the card’s medicare function at this time. This same approach was employed because implementation was subsequently expanded to the peripheral areas. In addition, the project rollout was staggered among the different user groups (i.e. retirees, Shanghai employees and non-Shanghai employees) to give the project team adequate control and time for effective trial-and-error learning. Thus, the initial rollout in the urban central districts was only targeted at retirees.

In all, the Shanghai government shaped its institution for running the system mainly based on the IT system needs. Nevertheless, it also adjusted the IT system design according to the institutional constraints and needs. The administrative office held joint meetings with relevant agencies and private sector experts to further adjust government back-office processes, modify regulatory guidelines, and fine-tune the technological architecture. All problems and solutions were also carefully documented. By the end of 2001, smart cards had been issued to the majority of the target population. Given the take-up rate of the new social security card, the magnetic cards that previously facilitated medicare account management, were subsequently abolished in March 2002. This shows that the institutional requirement has adjusted the IT resource configuration at the same time.

Institutional resources were shaped by IT resources, and in turn, reshaped IT resources. They together solidified information sharing rules derived from the card systems. As “The Administrative Method for Shanghai Social Security and Citizen Service Information System” regulated:

“The relative departments should comply with the information sharing agreement and provide information to the basic-information database. The information should be transferred via the municipal information exchange platform... If the shared information in some business database is updated, the maintainer of that database should transfer this updated information to the shared database and other related business databases in no more than 24 hours.”
(http://www.962222.net/htmlnews/20070801/131.htm)
These institutional resources, combined with IT resources, have consolidated digital knowledge reach for the government. Here, high knowledge reach occurs with the capture of integrated knowledge about citizens, agencies, partners, and organizational processes. IT resources created substantial bases for knowledge reach by providing shared database, and shaped institutional resources to guarantee the realization of knowledge sharing among citizens, agencies, and external partners. Moreover, the process reach provided a base for the knowledge reach by enabling the direct information exchange.

Such knowledge reach, combined with the process reach, increased the government’s operational agility by responding to its own operational needs more efficiently. When citizens updated their personal particulars at one government agency, the new information would be captured in the central database and be made accessible to other agencies. Moreover, it simplified operational processes and reduced work load. An informant recalled:

“Based on a shared database, each agency has improved its management and service quality. A lot of works are very convenient to do now. For example, in the 2006’s Election of the People’s Congress of Shanghai Government, the government changed the previous process that required the public sectors to send out the electors’ certificates manually and required the citizens to fill in forms manually. For this time, the electors’ certificates were generated automatically when the electors swiped the card. It reduced many errors.” (http://www.rfidinfo.com.cn /Info/n11916_1.html)

The knowledge reach also enhanced the government’s partnering agility by building the ability to leverage assets, knowledge, and competencies of external partners (e.g., hospitals, banks) to provide more services. For example, the Administrative Office of Shanghai Social Security and Citizen Service Information System worked with several major banks and technology providers, to study the feasibility of linking up this citizen database to banking systems and enabling online payment for G2C services. In addition, the knowledge reach enabled the government’s customer agility in sensing more quickly and accurately on the trends of social change. The government could use the knowledge to develop more applications and do more research. Those data further equipped the government with analysis and decision support.

Thus, the second finding of our study is that:

In the implementation phase, IT resources (e.g., IS infrastructure, IS development) act as a molder to shape new institutional resources (e.g., formal regulation, informal norms, and organizational structure). During the shaping process, these newly-created institutional resources (e.g., formal regulation, and organizational structure) also adjust IT resources (IS infrastructure, IS management/planning) to consolidate digital knowledge reach. Based on such digital knowledge reach, the government develops operational agility, partnering agility, and customer agility.

5.3 The Popularization Phase

In the popularization phase, the case revealed that IT resources acted as a supporter to sustain the institutional resource configuration. First, IT human capitals supported the social security institutions to be popularized in the Shanghai city. In the Shanghai Social Security Card Service Centre, more than 130 IT people are devoted to maintain the system. In October 2004, this system got the ISO 9001 International Quality Management System Certificate, with which the quality of the system had been improved a lot by the IT service team. A wider range of citizen services were provided through a network of 2895 service centres all over Shanghai. For example, the card enabled Shanghai citizens to conduct social security-related transactions, such as claiming medical expenses, paying home loans, and applying for unemployment subsidies.

Second, the card system worked as a footstone to provide customized service to different groups of citizens. By June 2005, the Shanghai Social Security Card Service Centre had issued over 9.3 million cards to about 70% of eligible citizens. Consequently, the central database of the social security system hosted key personal information of about 20 million citizens in Shanghai.
Third, the card system helped to cultivate an e-government culture among all citizens and related institutions. Such informal norms contributed to the acceptance of the card system.

Fourth, IT resources assisted to replicate the social security card system in other Chinese municipalities and provinces. Several neighbouring provinces continually entered into collaborative agreements with the Shanghai government to tap onto the knowledge and experiences that the latter had gleaned from this project. Unlike the top-down relationship between the central and municipal governments, the relationship between municipal governments was largely based on collaboration and reciprocity. Extended implementation also facilitated the continuous renewal and improvement of the e-government implementation model in response to the changing environments.

Based on the support from those IT resources, the new social security institution has been institutionalized into the whole society in Shanghai as well as in other cities. Digital process richness has been created during this popularization phase. Here, digital process richness is built by embedding interactivity and customization. The citizens now have more interaction with the process, own more customized services, and know more about the government’s use of their information. Moreover, the knowledge reach also provided a base for the process richness by improving the quality of data.

Such process richness is pivotal to develop the government’s customer agility by responding to its citizens’ needs more efficiently. In China, prior to e-government, bureaucracy was a synonym of government and its external partners (e.g., hospital). The operational processes of government were mostly invisible to citizens. Even the government did not know how its external partners process the citizens’ information. After this social security card program, the process of government became more transparent to citizens, and the processes of partners also became more controllable for the government. All of these satisfied the citizen’s needs. An informant said:

“When the patients go to hospital, they can use the social security card for the whole process. The information systems of hospitals are connected with the Shanghai Municipal Medical Insurance Bureau. Thus, all the information about patients (e.g., personal backgrounds, prescriptions, and expenses) will be reported directly to the government. The hospitals are under intendancy of the government, and have no chance to forge. It makes the whole medical process transparent, and improves the relationships between hospitals and patients.”

This digital process richness helped the government to develop customer agility. Correspondingly, our third finding is that:

In the popularization phase, IT resources (e.g., IT infrastructure, IT development) act as a supporter to sustain the institutional resources (e.g., informal norms, and organizational structure) to be structured and institutionalized into the organizations. These institutional resources operate the IT resources to cultivate digital process richness. Based on such digital process richness, the government develops customer agility.

6 DISCUSSION AND CONCLUSION

6.1 Conclusion

The importance of resource configuration to agility development is evident from our case study. It is clear that dynamic processes of resource configuration lead to organizational agility development. Moreover, resource configuration cannot reach the goal in one step. Distinct dynamic resource configuration processes are looped as the project unfolds over time. During these processes, IT resources and institutional resources interplay with each other and together weave different digital options and create corresponding organizational agility.

The process model of resource configuration and agility development further illustrates that IT and institutional resources are configured interdependently and complementarily. In the initiation and
development phase, IT resources play as an initiator, and guide the institutional resources to be assembled. The readiness of the institutional resources provides a fundamental base to develop new IT systems. This sequence of resource configuration assures to realize digital process reach in the organization because the institutional resources called by IT resources are prepared to redesign the process for IT plan. The redesigned connected process brings the organization with operational agility.

When the IT system has been developed, new institutional resources are required to assure smooth implementation according to the developed system because the IT system has its own structure. However, the IT system also should be adjusted according to the needs of institutions in the implementation phase. The back-and-forth process of resource configuration consolidates digital knowledge reach in the organization because the IT resources provide a hardware environment for knowledge sharing and the corresponding institutional resources create a software environment for knowledge sharing inner and between organizations. The ability to share knowledge equips the organization with operational agility, partnering agility as well as customer agility.

After implementing the IT system and new institutions, IT resources continue to support the operation of new institutions. This course of resource configuration cultivates digital process richness in the organization because the institutional resources combined with IT resources create a transparent process to customers, which also increases the organization’s customer agility.

6.2 Limitation and Future Research

This article is not without its limitations. Firstly, as the agility development literature implies, there could be some co-evolution adaption loops between agility development and resource configuration (Sambamurthy et al. 2003). For example, a higher level of agility may further enhance digital options and contribute to better capabilities of resource configuration. However, as we were bounded by feasibility concerns and the limits of the data collected, we did not propose such loop in this study. Future research can investigate the subsequent process of such co-evolution adaption loops.

Secondly, we acknowledge that besides IT and institutional resources, it is possible that other resources (e.g., financial resources) also participate in the resource configuration process and agility development process. Future research can be directed at collecting data which reflecting the role of other resources.

6.3 Theoretical and Practical Implications

The process model of resource configuration and agility development presented in this paper has significant implications for researchers and practitioners. For researchers, our model is the first one that has elaborated the process of resource configuration which leads to governmental organizational agility. While previous studies have suggested that IT resources can enable organizational agility (Sambamurthy et al. 2003), our model makes it more clear that a dynamic resource configuration process does take place and impact the agility development. It contributes to the organizational agility literature by complimenting the resource-based view with a resource configuration process. It also illustrated that in the dynamic resource configuration process, how IT and institutional resources could be configured interdependently and complementarily.

For government agencies that want to derive organizational agility, this study serves as a useful reference. It provides useful insights of how to configure resources to shape agility. The Shanghai Social Security Card System case underscores the need for government agencies to configure IT and institutional resources step by step. It suggests that government agencies should pay attention to different resource configuration in different phases of an e-government project. It also highlights that what types of organizational agility could be derived from which phases. All these suggestions can avail government agencies towards a higher organizational agility.
References


