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Abstract: The existing studies on e-government outsourcing pay attention to the factors that influence the service satisfaction of software service providers, and there is currently little research on how software service providers develop during different phases involved, which plays an important role in the e-government outsourcing projects. We apply the literature on business ecosystem and resource orchestration which may be crucial to the development of a software service provider to analyze a typical software service provider in the field of electronic tax outsourcing. In doing so, a process model of how a service provider makes resource orchestration as environments change and develops its focal capabilities is inductively derived that sheds light on the process from a niche player to be a keystone in three distinct phases. The process model reveals that the role of the software service provider within its ecosystem is evolutionary in nature. With above findings, this study provides practitioners a comprehensive and empirically supported framework and shows a successful process model of how to be a keystone within the e-government ecosystem.

Keywords: E-Government Outsourcing, Business Ecosystem, Resource Orchestration, Software Service Providers, Development Model, Case Study

1. INTRODUCTION

E-government projects are widely adopted by national governments as information technology develops. Because they are complicated, governments usually outsource service to enterprises[1]. However, the e-government outsourcing brings risks, especially for some important departments[2]. The e-government projects in China are still exploring in practice and the development of software service providers influences the e-government outsourcing projects[3]. Consequently, for both government departments and software service providers, how the software service providers develop is an important issue, which can avoid the failure and provide theoretical and practical implications.

The majority of the existing literature on e-government outsourcing[1-3], has looked at the service satisfaction and has not yet discussed software service providers' development model. Today's most influential businesses tend to be business ecosystems[4]. The literature on business ecosystems is well-suited for informing a networked perspective of software service providers as it is replete with prescriptions for evolving in the networked economy[5,6]. At the same time, the practices that software service providers make resource orchestration and develop focal capabilities with environment changing are referred to resource orchestration[7].

Using a case study of a typical software service provider in the electronic tax outsourcing, the purpose of this study is to discuss the role of software service providers in their e-government ecosystem from a resource orchestration perspective. By constructing a process model, this paper will contribute to existing knowledge by opening the black box of how software service providers develop and evolve in their ecosystem and provide actionable prescriptions for practitioners that are grounded in the empirical reality of the e-government outsourcing. Specifically, this study aims to answer are: (1) How software service providers develop in different phases? (2) How the role of software service providers evolves in their e-government ecosystems?

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2. THEORETICAL BACKGROUND

2.1 Resource orchestration

A firm is essentially a series of resources promoting or limiting its growth and creating competitive advantages[8]. Gradually the resource-based theory(RBT) is formed. Recent years a dynamic capability perspective as a supplement is added to RBT, referring to the ability that a firm can achieve congruence with the change of business environment and gain new competitive advantages by updating resources[9,10]. Hence, "resource orchestration" is proposed and then has been widely used in information systems[11].

To cope with the change of the external environment, enterprises should reconfigure their resources and then develop new focal capability[10,11], which resource orchestration provides a bridge between uncertain environments and capabilities[7]. Although related studies are insufficient, the existing studies cover all three aspects: resources, the environment and action[12,13]. Based on resource orchestration, some studies focus on the adoption and implementation process of information technology within an organization and explain how resources are configured to develop focal capabilities[7,14, 15].

2.2 Business ecosystems

A firm should be viewed not as a member of a single industry but as part of a business ecosystem [16]. These Business ecosystems refer to networks of organizations held together by formal contracting and mutual dependency[5]. The entities of a business ecosystem consist of suppliers, producers, retailers and customers that work cooperatively and competitively[6]. Studies about business ecosystems have emerged as a response to the growing need for a new paradigm for strategizing, competing and innovating in the networked economy and have their intellectual roots in theories of complexity[5].

Generally every business ecosystem develops in four distinct stages: birth, expansion, leadership, and self-renewal or death[6]. The role which a firm plays in a ecosystem has profound implications for ecosystem development[16]:(1) a niche player, which is specialized functions and does not occupy a network hub[5,18]; (2) a keystone, improving ecosystem health and increasing its own operational performance[5]; (3) a dominator by exploiting their centrality in the network to take control from the ecosystem. The keystone and niche player generate vitality, productivity and competitiveness, which are indispensable to create a prosperous and healthy business ecosystem. The dominator not only creates extremely limited value, but also extracts value desperately, which may ultimately collapse and lead to the demise of a business ecosystem[18].

3. RESEARCH METHODOLOGY

The case research methodology is particularly appropriate for this study for several reasons. First, our research questions are how questions that focus on the development process of software service providers. Second, because the development model are multi-dimensional and include resource orchestration and business ecosystem dimension, which an objective approach may be difficult to cope with. Consequently, it may be more appropriate to examine the phenomenon by interpreting the relevant stakeholders' shared understanding[19].

Based on the principles of typical and theoretical sampling, we selected a typical software service provider in the electronic tax services outsourcing, Henan Aerospace Jinsui electronics Co. Ltd. (hereinafter referred to as Jinsui) as the object of our study, the main reasons are as follows: (1) Jinsui was the service provider of Henan province at the beginning of the "golden tax project" which is one of the most mature field of e-government projects in China. (2) Jinsui was a successful enterprise compared with others in the Chinese electronic tax.

3.1 Data collection

Research access was negotiated and granted from 2010 to 2015. The semi-structured interviews were conducted by a team of 5 researchers with questions that were exploratory in nature, open-ended and tailored to the role of the person interviewed. Each interview took an average of 4 hours and was recorded for data analysis. Data collection was summarized in Table 1. At the same time, data from the interviews was supplemented by

secondary data, onsite observation, archived files and informal communication. These sources of data were used to validate the interview data obtained [20].

Table 1. Summary of data collection

Informant		Time	Themes covered	Duration (hours)	Transcript (thousands word0
Jinsui	General Manager, Vice General Manager	2010.6	The development history and informatization of Jinsui	4	20
	General Manager, Vice General Manager, Branch Managers(6 persons)	2012.1	The progress of Jinsui's Blue Ocean Strategy and circumstance of each department	6	75
	Frontline Employees (5 persons)		Staff's opinion towards Jinsui's service	3	15
	General Manager, Vice General Manager	2015.1	The important events of Jinsui's during each stage and new progress of Jinsui's change	3.5	17
Jinsui's Users	Accountants of 3 typical enterprises(6 persons)	2012.1	Service satisfaction towards Jinsui	4.5	25

3.2 Data analysis

Data analysis was performed in tandem with data collection to take advantage of the flexibility that the case research methodology affords[20]. We constructed a theoretical lens based on the literatures on business ecosystems and resource orchestration[5,7,17,18]. As part of this lens, we identified an initial set of 2 aggregate theoretical dimensions and 6 second-order themes[7,17] that were potentially relevant to our inquiry (refer to Table 2). We then used the theoretical dimensions and second-order themes to guide our questions for subsequent interviews. Each new finding was verified to ensure that it was supported by at least two sources of data[20], and our theoretical lens was modified incrementally whenever new findings that challenged the existing schema emerged. Data analysis was then carried out by moving back and forth between empirical data, the theoretical lens, relevant literature and the emerging process model.

Table 2. Information system levels Dimensions and themes of theoretical lens

Theoretical dimension	Second-order themes
Resource orchestration	Environmental climate
	Resources-focused actions
	Focal capability
Business ecosystems	Boundary
	Role
	Nature of ecosystem development

4. CASE DESCRIPTION

4.1 Organizational background

Jinsui plays a leading role of IT-enabled enterprises in Henan province and has nearly 30 thousand enterprise users including many well-known large enterprises. Jinsui has 52 branches and offices and 59 three-tier service network of technical support service station, with the business scale of more than 200 million RMB. Jinsui was founded in 1999 by Aisino Co. Ltd. (hereinafter referred to as Aisino) and XuJi Group Co., Ltd. Authorized by Aisino, Jinsui undertook the service promotion and technical collaboration task of anti-forgery tax control system which was aimed at special invoices for value-added tax(VAT) and was part of the "golden tax project" in Henan province.

From the interview data, it became readily apparent that Jinsui underwent three distinct phases within the ecosystem it located; adopting different resource orchestration and ecosystem roles in each phase that resulted in different forms of ecosystem development. We organize the presentation of our data according to the temporal sequence of the phases in the subsections that follow. We refer to the three stages of business ecosystem as the birth phase, the expansion phase, and the self-renewal phase, respectively.

4.2 The birth of ecosystem(2003-2005)

In the first phase from 2003 to 2005, Jinsui was authorized by Aisino as a service provider in Henan province and served customers about the anti-forgery tax control system. As the introduction of the tax control system, the number of customers increased sharply. Jinsui came across all sorts of problems on its response, service quality and service management. To meet the demand of the growing customers, Jinsui built a call center in the headquarters, which was unified to provide consultation about technical problems and door-to-door service. The professional and technical staff in the call center provided 7 * 24 hours service for customers, solved problems quickly and accurately, and improved the Jinsui's efficiency of solving problem. The problems that the call center couldn't cope with were then arranged to the service station.

As a service provider, Jinsui built the call center and enhanced its capability to sense and response customers' needs. Jinsui provided consulting service and at the same time collected customers' feedback for the corresponding departments, which helped Jinsui adjust the service content, service standard and resources. Table 3 presents the dimensions and themes that we found to be salient in this phase and their supporting evidence.

Table 3. Dimensions, themes and data in the birth of ecosystem phase(2003-2005)

Dimensions and second-order themes		Representative data
Resource orchestration		
Environmental climate	Jinsui was challenged by the increasing customers	*"Because of the increasing customers, our response capability was poor. Customers thought that it was a waste of time to have door-to-door service dealing with some easy problems."*-Service Center Manager of Jinsui
		"Different customers had different needs. The service management was chaotic and employees' enthusiasm was low."-Training Center Director of Jinsui
Resources-focused actions	Acquisition and deployment	*"The call center supported the service process and made us more closely with customers, which we could know their need."*-General Manager of Jinsui
		"The call center was not an independent IT system. It connected with the decision department, training center and service station."-Call Center Director of Jinsui
Focal capability	Capability for sensing and responding	*"We could response and service for 7 * 24 hours. If the customer requested, we could have door-to-door service in 24 hours."*- Call Center Director of Jinsui
		"With the feedback information, we did internal adjustments constantly, such as the service content, service specification and R&D."- Vice General Manager of Jinsui
Business ecosystems		
Boundary	Aisino	*"Jinsui was the only firm authorized by Aisino in Henan province and provided service about the anti-forgery tax control system. We didn't develop the tax control system. We just provided service for the enterprise users."* -General Manager of Jinsui
Role	Service provider	
Nature of ecosystem development		

4.3 The expansion of ecosystem(2006-2013)

After the efforts of the previous phase, Jinsui had established a firm dominance in Henan province and had built extensive contact with its customers. However, Aisnio's products were outdated with high prices. If Jinsui continued to be a service provider, its market growth would be limited. Jinsui carefully discussed and formulated the "Blue Ocean Strategy", aiming at providing original products and services. In 2011, the income that Jinsui played as a producer had exceeded the income it played as a service provider.

To carry on the "Blue Ocean Strategy", Jinsui focused on creating its own products on the basis of its service. On one hand, Jinsui concentrated on capturing customers' requirements and creating new products. First, Jinsui increased the size of its R&D. Second, Jinsui unified the software development platform and introduced the new management system. Third, Jinsui funded prizes for successful innovations. At last, Jinsui encouraged employees to start up business and establish firms. On the other hand, Jinsui continued to enhance its service quality such as establishing the ministry of service supervision and CRM system, paying a return visit to its customers, using reward and punishment system for its employees' service, etc.

As a producer, Jinsui had advantages to obtain enterprise users' needs and developed new products with its experiences as a service provider. Jinsui improved the capability to cooperate with customers for their requirements, with NISEC for developing new products and with employees for encouraging innovation. Table 4 presents the dimensions and themes that we found to be salient in this phase and their supporting evidence.

Table 4. Dimensions, themes and data in the expansion of ecosystem phase(2006-2013)

Dimensions and second-order themes		Representative data
Resource orchestration		
Environmental climate	Outdated products with high price	*"The products of Aisino were outdated with high prices after ten years. We decided to develop new prodcuts."*-General Manager of Jinsui
Resources-focused actions	Enrichment and integration	*"We set up the ministry of service supervision and CRM system in order to supervise the service process and have more access with customers."*-General Manager of Jinsui
		"The tax control disk we developed with NISEC, had similar function with the anti-forgery tax control system, but was more advanced. We also created 5 or 6 integration products of tax informationization.." – Vice General Manager of Jinsui
		"We rewarded employees for their innovations. We also encouraged our employees to start up business and had established 7 firms."-General Manager of Jinsui
Focal capability	Capability for cooperating	*"We let our customers present their requirements, and then we developed a series of products without a fee. After the products released, we got benefit. Our customers and us were mutual benefit."* - General Manager of Jinsui
		"We established new firms in which our employees had holdings, improving their enthusiasm." -Vice General Manager of Jinsui
		"The tax control disk we developed with NISEC was a major product of our Blue Ocean Strategy, and the foundation to national market."- General Manager of Jinsui
Business ecosystems		
Boundary	Aisino	*"We continued to have Aisino's authorization and provided service in Henan province. Then we communicated with our customers, government and NISEC to capture their needs and then develop our own products."*- General Manager of Jinsui
Role	Producer	
Nature of ecosystem development		

4.4 The self-renewal of ecosystem(2014-Present)

In 2014, authorized by government, NISEC began to compete with Aisino. At that time, Jinsui left from the service system of Aisino and joined into the service system of NISEC. Jinsui and another firm of NISEC were merged to become a new firm and undertook the task of tax control for 28 provinces in China.

During this phase, Jinsui focused on two aspects: (1) providing service to customers and competing with firms of Aisino; (2) supplying its own products in 28 provinces of China. According to the latest interview, Jinsui was still restructuring in transition and was introducing their past service framework to the national market, making replication. Therefore, Jinsui should develop a strong capability to replicate, combined with the new environment, and applied the service framework to the other 27 provinces. Table 5 presents the dimensions and themes that we found to be salient in this phase and their supporting evidence.

Table 5. Dimensions, themes and data in the self-renewal of ecosystem phase(2014-Present)

Dimensions and second-order themes		Representative data
Resource orchestration		
Environmental climate	Jinsui undertook for 28 provinces	*"NISEC served 36 provinces. Another firm of NISEC and Jinsui were merged to become a new firm and undertook the task for 28 provinces."* - General Manager of Jinsui
Resources-focused actions	Conversion and extension	*"Our partner was a listed company and we set up the head office. Then we integrated the holding shares of each company to the head office."* - General Manager of Jinsui
		"The call center was undertaken by NISEC. We developed the national service network according to the past service framework in Henan province and might do appropriate modification." – Vice General Manager of Jinsui
		"It would take some time for the employees of our partner to adapt to a new situation." - General Manager of Jinsui
Focal capability	Capability for replicating	*"We developed the tax control products, introduced our past service framework to the national market and made replication in the provinces we involved. In fact, we were selected by NISEC because of our experience."* - General Manager of Jinsui
Business ecosystems		
Boundary	NISEC	*"Aisnio began to have holdings of the firms in its system and we left the system of Aisnio. Then we jointed into the system of NISEC which we had cooperation with in the previous phase and continued to develop our new products."*-General Manager of Jinsui
Role	Producer	
Nature of ecosystem development		

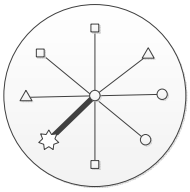
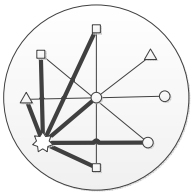
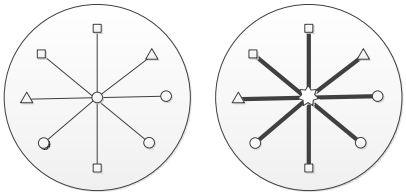
5. DISCUSSION

By integrating the different patterns of Jinsui across the three distinct phases, a process model of how Jinsui developed and leveraged for resource orchestration in its ecosystem (refer to Table 6) can be inductively derived. As our model suggests, the development of Jinsui is an evolutionary process. Given that our model is inductively derived from the Jinsui case study data, the following stream of reporting provides an explanation of how the existing literature corroborates our model and how the model enriches the existing perspectives.

At the time of the ecosystem's inception, to cope with the increasing number of customers, Jinsui enhanced its capability of sensing and responding with the appropriate acquisition and deployment of resources. As a service provider in the ecosystem of Aisino, Jinsui was a niche player which was specialized functions and does not occupy the ecosystem[5,18].In the second phase of ecosystem development, Jinsui grasped the opportunity that Aisino's products were outdated with high prices. Jinsui set up the strategy of "Blue Ocean", and developed new products as a producer. Jinsui improved the capability of cooperating with its customers, government departments and NISEC for their needs Enrichment and integration of resources can contribute to the current capability[14]. Though Jinsui was still a niche player in the ecosystem, the network of its own turned up.In the self-renewal of ecosystem, Jinsui left from the ecosystem of Aisino and jointed into the ecosystem of NISEC. The market of 28 provinces was belong to Jinsui. On the basis of past successful experiences, Jinsui advanced the capability for replicating with conversion and extension of resources. At that time, Jinsui became a keystone which can improve ecosystem health and increase their own operational performance[5].

The role which Jinsui played in its ecosystem evolved. Based on the case data, our model suggests that when a niche player in the e-government ecosystem want to be a keystone: (1) it should know their customers' needs and makes its advantages best; (2) it should improve the capability to connect with the stakeholders and bring out its own network; (3) it should seize the chance to create innovations and use its resource as the environment changes[18].

Table 6. Process Model of Jinsui's development

Phase		The birth	The expansion	The self-renewal
Resource orchestration	Environmental climate	The increasing customers	Outdated products with high price	Jinsui undertook for 28 provinces in China.
	Resources-focused actions	Acquisition and deployment	Enrichment and integration	Conversion and extension
	Focal capability	sensing and responding	cooperating	replicating
Business ecosystems	Boundary	Aisino	Aisino	NISEC
	Role	Niche Player: Service Provider	Niche Player: Producer	Keystone: Producer
	Nature of ecosystem development			

6. CONCLUSIONS

6.1 Theoretical and Practical Implications

By addressing the research questions set forth at the beginning of this paper, this study makes several important theoretical contributions. First, previous studies on e-government software service providers, mainly focus on the influence factors of service satisfaction. Discussion and analysis of the service provider's development patterns have not been involved [1-3]. This study underscores the need to pay attention to the role of software service providers in the development of e-government ecosystem from a resource orchestration perspective. Our process model has pointed out how a software service provider develops resource orchestration from a niche player to a keystone in its ecosystem.

Second, this study also makes significant contribution to the literature on business ecosystems. Although previous studies have identified a number of antecedents for ecosystem development [4.5,17],the process model developed not only describes the necessary conditions for successful ecosystem development, but also structures how a niche player uses resource orchestration in its ecosystem and then evolves to be a keystone in a new ecosystem.

Finally, this study proposes a specific combination of resource orchestration and business ecosystem contribute to the development of the software service provider in the electronic tax field. The process model developed in this article advances the state of existing knowledge by providing specific and testable propositions for IT-enabled enterprise to change roles successfully that are grounded in the empirical reality of a real world organization.

In terms of implications for practice, this study is significant in that it provides a comprehensive and empirically supported framework for the role and development of a software service provider within its ecosystem. More specifically, the result of our study shows a successful process model of how to be a keystone within the e-government ecosystem for government and other software service providers.

6.2 Limitations and Future Research

This article is not without its limitations. The third phase of our case study is the self-renewal of the electronic tax ecosystem from 2014 and up till now Jinsui is still exploring in practice. The result that Jinsui makes resource orchestration and develops within the ecosystem in the third phase is unknown. Future research can be directed at the progress of Jinsui to expand the research content of our study.

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