A Strategic View of E-Service Innovation in an Open Environment

HungTai Tsou[1] Russell Ching[2] JaShen Chen[1*]
1 Graduate School of Management, Yuan Ze University, Taiwan
2 College of Business Administration, State University of California at Sacramento, USA
[*]EMAIL: jchen@saturn.yzu.edu.tw

Abstract: In this study, we provide an in-depth discussion and a more comprehensive conceptual framework of e-service innovation. In particular, we probe the relationship between collaboration and innovation practices within an open innovation paradigm.

Keywords: e-service, open environment, innovation

I. Introduction

Innovation on services has been a popular research issue in recent years. One of the important topics of service innovation is to study how to conduct service innovation in the virtual environment or called e-service innovation. E-service innovation involves the creation, modification of service cultures, organizational structures, practices, processes or products in a virtual business environment. Although there have been a number of researches on the investigation of information technology (IT) adoption on service innovation and have indicated IT as an important factor for successful service innovation practices, there is only little discussion on e-service innovation and the key drivers for e-service innovation success. Moreover, in contrast with the early e-service applications, which were primarily developed to decrease operational costs and increase efficiency through automation, an emerging view of e-service focuses on its ability to improve the level of customer service, increase customer satisfaction and lead to higher profits" (Rust and Kannan, 2003), i.e., e-service should be used to foster relationships with customers and increase customer equity through new (innovative) services. Thus, in this study, we provide an in-depth discussion and a more comprehensive conceptual framework of e-service innovation. In particular, we probe the relationship between collaboration and innovation practices within an open innovation paradigm.

II. Constructing an E-Service Innovation Framework

Admittedly, in order to implement e-service innovation, firms require capabilities to implement collaboration behaviors, to execute service innovation practices, and to reconfigure technological platforms. Moreover, they also need to reconfirm what business resources they possess, what electronic capabilities they have established, and what partner selection strategies they have developed. Accordingly, we propose that "interfirm codevelopment", "partnerships", and "technology resources and capabilities" are the core elements for facilitating e-service innovation. Due to the rather little attention that is paid to e-service innovation, the aim of this study is to provide a general research framework of e-service innovation based on a review of innovation model literature (e.g., Abbey and Dickson, 1983; Ettlie, 1983; Damanpour, 1991; Hadjimanolis, 2000; Hult et al., 2004; Tidd and Trewhella, 1997; Verhaeghe and Kfir, 2002; Wolfe, 1994). Included is the aim to find the drivers of e-service innovation, particular interorganizational behaviors, technology integration, and partnerships and e-service innovation results. Correspondingly, the present paper examines the relationship of e-service innovation and studies its impact on organizational performance.

In order to implement e-service innovation, firms require capabilities to implement collaboration behaviors, to execute service innovation practices, and to reconfigure technological platforms. We focus on interfirm co-development competency, e-service innovation, and partner match. Furthermore, we indicate that the mediating effects of technology integration mechanisms (TIMs) between interfirm co-development competency and e-service innovation, as well as the moderating effects of TIMs, and partner match on the relationship between interfirm co-development competency and e-service innovation. We choose resource dependence theory (RDT), strategic innovation theory and contingency theory to support interfirm co-development competency and e-service innovation. We then argue research propositions to specific relationships between these constructs.

The overarching contribution of the study lies in theoretically developing the idea of interfirm co-development competency in the e-service innovation practices. The perspective that e-service innovation can be viewed as a practice of embodying partner match in interfirm co-development competency that is within open innovation environment a novel complement to prior research on service innovation. We also propose that TIMs is associated with improved e-service innovation. Our conceptualization of TIMs as bridging pragmatic, semantic, and syntactic mechanisms across NSD domains is a noteworthy refinement of prior conceptualizations. The perspective that integration of knowledge and technology in

e-service processes is key mechanisms through which new e-service development and improvements can be realized extends research on improving e-service innovation in organizations. We suggest that organizations can exploit partners' knowledge and technology by integrating them in co-development processes and highlight the centrality of their roles in e-service innovation. We also suggest that TIMs in innovation practices can facilitate the interpretation and leverage of them by firms that might enhance e-service innovation. Moreover, the interfirm co-development competency influences the extent to which firms integrate technology across organizational boundaries in the e-service innovation. A noteworthy theoretical implication is that absorptive capacity, coordination capability, and relational capability are necessary for effective interfirm co-development competency.

III. Background Study

Although relationships of interorganizational collaboration-innovation practices are substantial, relatively little research has focused on identifying the "collaboration competency" way in which such competency relate to the practices of innovation. In answering such gap, given the research of Swan et al. (2007), they indicated that innovation involves intense collaboration across organizations, organization's collaboration capability (i.e., relational capability) was identified as crucial. They explored that there are specific mechanisms through which organization collaboration capabilities are likely to have effects on innovation practices. Therefore, reflecting the absence of prior collaboration-innovation work, we attempt to seek mechanisms that link to interorganizational collaboration competency and play an important role (such as mediator role) in shaping innovation practices.

We reviewed and summarized that relevant research is lacking in two respects. First, Ettlie and Reza (1992) found that integration is conducive to innovations. Furthermore, recent collaboration-innovation studies have mainly considered the knowledge integration as a mediator to contribute to innovation practices (e.g., de Man and Duysters, 2005; Numprasertchai and Igel, 2005; Singh, 2007). Particularly, integrative mechanisms provide information through input from diverse individuals or organizations and different types of information needed to foster innovation adoption than would otherwise be available (Hage, 1980). Collaboration among two different firms is required to achieve both IT platform integration and related technologies integration (Andriole, 2006). A fundamental activity of collaboration effort is to meld individually held technological information and relevant technologies into a common IT platform or system that can be applied to innovation practices. We propose that an effective mechanism for achieving such technology integration is to coordinate the applications of interdependent IT and electronic data exchange processes

with each other. Therefore, in this paper, we identify this mechanisms as technology integration mechanisms (hereinafter, TIMs) and also focus on the mediator role of TIMs in the relationship between interfrm co-development competency and e-service innovation.

In addition, e-service innovation is the fruit of the fusion of electronic technologies and novel service methods. Interfirm co-development competency, such as combination of complementary electronic technological resources and capabilities, can be a critical contributor of new innovation method for e-innovation development. However, to be combined effectively, these resources and capabilities must be integrated to match the co-development technical platform of each other. This is the focus on the moderator of TIMs.

Therefore, we consider TIMs play both mediator and moderator roles. We examine TIMs as very important facilitating conditions for e-service innovation. Indeed, some studies have shown TIMs (i.e., Amir-Aslani and Negassi, 2006) is important mediator for innovation outcomes whereas little empirical research has been published the investigate the mediating role of TIMs between interfirm co-development competency and e-service innovation. Therefore, we aim to contribute to our research problem by studying how to achieve successful e-service innovation through integrate knowledge and technology. Following research problem, our research model based on Deck and Strom's (2002) co-development model, the terms of the two elements (i.e., partner selection and IT tools) are modified as "partner match" and "TIMs", another element, processes, is served specifically as "e-service innovation" that investigates its relationship to the other elements. Accordingly, we propose that "interfirm co-development competency", "partner match", and "TIMs" are the core elements for facilitating e-service innovation.

Initially, we discuss the perspectives on interfirm co-development competency, e-service innovation, TIMs, and partner match that follow from RDT, strategic innovation theory, and contingency theory. Due to the dramatic changes that have taken place in both the economic and the political environments of firms, examining interfirm co-development competency and e-service innovation present a pragmatic opportunity to examine the value of resource dependence and strategic innovation theories for understanding this issue, and using contingency theory for explaining the relationship among interfirm co-development competency, TIMs, partner match, and e-service innovation.

Service innovation
Innovation has been defined as "the initiation, adoption, and implementation of ideas or activity that are new to the adopting organization" (Pierce and Delbecq, 1977; Daft, 1978; Rogers, 1983; Damanpour, 1991; Fichman, 2001). Intrinsically, it is about identifying opportunities to create

new products, services, or work practices (Van de Ven, 1986; Tushman and Nadler, 1986) and using new knowledge to offer new products or services that customers want (Afuah, 2003). Furthermore, Gadrey et al. (1995) implied innovation assumes a main form that services or products which are to varying degrees new to the market or new to the firm. In this study, we follow the traditional definition of Thompson (1965) and define innovation as the generation, acceptance, and implementation of new processes, products, or services for the first time within an organization setting.

e-Service innovation

Owing to EC generality, companies are increasingly turning to the Internet to deliver products and services to their customers. Nevertheless, how to provide better services to customers and more business opportunities to companies by internet applications and wireless communications applications are some of the most important issues that cannot be ignored by contemporary firms. Therefore, it is important to understand the role of electronic service (e-service) in this new business model. Specifically defined, e-services are the provision of service by a typical service organization over Internet and wireless networks such as ATM, smart card networks, etc (Rust and Kannan, 2003). Hoffman (2003) defined e-services in two ways: one is in the marketing sense of the services as "bits of usefulness" that help people solve problems and meet their needs; the other is in the IT sense of the services as "the machine-to-machine provision of software functionality" that provide outside of human interaction or perception. Similarly, Stafford (2003) described e-services from marketing and technological perspectives. Marketers see e-services as digitally delivered products and customer services; from a technological view, technologists naturally see e-services as Web-delivered software functionality, often characterized under the rubric of "Web services." Therefore, from this description Stafford's definitions lead to the conclusion that is supported by Hoffman's (2003) assertion---"e-service = Marketing + MIS." More recently, Zhang and Prybutok (2005) adopted Gartner's complete definition of e-service and defined it as including the processes, policies, procedures, people, tools, and technologies that enable enterprises to provide assisted and unassisted customer service using the Internet as its platform. As a result, in this study we adopted Zhang and Prybutok's definition of e-service.

Traditionally, the concept of e-service has been written about customer service (Rust and Lemon, 2001). Its fundamental philosophy and central concept is the focus on customers (Rust and Kannan, 2003). Recently, it has been primarily concerned with the provision and development between an organization and its external customers (e.g., Mieczkowska and Barnes, 2002; Sousa, 2002; Zhu et al., 2002) and internal customers (e.g., Croom and Johnston, 2003). E-service encompasses not only the domains of

business-to-business, business-to-consumers, government-to-public, and intraorganizational entities, but also includes the service products, service environment, and service deliveries that comprise any business model (Rust and Kannan, 2003). Because of advanced IT applications, companies have started using e-services as a means of automating relations with their customers and allowing customers to form alliances (Lu and Zhang, 2003). Thus, for customers, e-services can greatly reduce the cost of IT operations; for companies, offering e-services is considered useful for improving intra/interorganizational relationships and generating new revenue streams (Hoffman, 2003).

To better understand e-service features, we utilize the relevant concepts from Song's (2003) Federal Express (FedEx) study, and adopt the e-service features of FedEx as this study's e-service features. Because of the Internet and EC, FedEx, a leading global company, has evolved toward an information delivery business providing customer service online and bringing a new dimension to corporate functionalities (Song, 2003). For that reason, we apply e-service features what FedEx provides to our e-service features arena.

Recently, there has been a great debate in the literature concerning the nature of e-service (e.g., Bolton, 2003; Hoffman, 2003; Rust and Kannan, 2003; Stafford, 2003; Song, 2003). Some scholars developed an e-service model to examine the e-service quality from a consumer perspective (e.g., Zhang and Prybutok, 2005). Others probed into how e-service affects consumer behavior (external customer service) (e.g., Rust and Lemon, 2001) and leads to staff satisfaction (internal customer service) (e.g., Croom and Johnston, 2003). From a business strategic perspective, Lu and Zhang (2003) further developed a cost-benefit factor-relation model of e-service. This model helps companies to improve the e-service strategic planning and competitiveness and to implement suitable e-service practices to fulfill customer demands. Regardless of these discussions, there does seem to be general agreement about how companies can continue to provide innovative services to satisfy customer demands and enhance service values.

Consequently, from above notions of service innovation, e-service, and online innovation discussion, we propose that the nature of e-service innovation by combining with theoretical considerations of e-service, online innovation, and service innovation concepts and characteristics. The reason behind this is we strongly believe that a proper e-service innovation calls for e-service offerings, online innovation, and with the aid of service innovation practices, solid groundwork for e-service innovation can be established. Hence, we adapted from Hinnant and O'Looney (2003) and Järvinen and Lehtinen (2004) to define e-service innovation in the following way: *e-service innovation is a new e-service or new e-service marketing and/or production processes targeted to respond better to the needs of customers and invented by using technical*

skills and capabilities of service providers in a simultaneous interaction through electronic technologies in order to attain risk mitigation.

Interfirm co-development competency
Although partnership, alliances, cooperation, and coordination notions have become the new business operational way for interfirm collaboration practices as the environment becomes increasingly competitive, there has been relatively little academic research on interfirm co-development competency. The literature directly related to the definition of co-development competency is still scarce. Deck and Strom's (2002) co-development model identifies a set of integrated practices that define the best co-development model as having three levels: a strategy for development chain design, process and governance structures that define how the partners work together, and IT that supports collaborative development. Furthermore, drawing on related new product development (NPD) literature, the research of Appleyard (2003) investigated the downstream-upstream cooperation (i.e., buyer-supplier co-development) to describe co-development as the cooperative relationships that two or more firms cooperate to either introduce new products or improve the quality of existing products lines. Furthermore, from the NPD alliances perspective presented by Emden et al. (2006), new-generation NPD practices—co-development alliances and clarifying defined co-development alliances are nonequity-based collaborative relationships enjoined by two or more firms to create value by integrating and transforming disparate pools of know-how related to new product or service development.
Following these definitions, we propose that co-development is two or more parties working together to develop and release a new product, service, or technology for mutual benefit. Accordingly, we develop and test a new construct that is called "interfirm co-development competency." We define such a competency as an organizational ability for finding, developing, and managing collaboration. Therefore, in this article, we conceptualize the construct of interfirm co-development competency as *a property of the relationship among the organizational entities participating in new products or services development*. For further understanding this new construct, we apply to research of Ettlie and Pavlou (2006). They captured interfirm NPD partnerships and NPD alliances (i.e., Sivadas and Dwyer, 2000), we use the term "interfirm co-development competency" to compose of three facets: absorptive capacity, coordination capability, and relational capability.
Absorptive capacity Absorptive capacity refers to the capability of firms to assimilate, identify, transform, and make use of new information or knowledge from the environment (Cohen and Levinthal, 1990). It also expresses an organization's ability to assess, appropriate, and exploit knowledge and is seen as depending to a large

extent on the company's motivation to learn from its partners (such as cultures and technological competencies) (Grunwald and Kieser, 2007). Absorptive capacity has two general states that the external knowledge *could* be acquired and utilized and *has* acquired and utilized by firms (Zahra and George, 2002). Here, we focus on the interfirm level. If the firm lacks sufficient relevant prior knowledge, it may have to acquire it through an alliance or an acquisition (Hitt et al., 2000), thus enhancing exploration (Lavie and Rosenkopf, 2006). In other words, firms can broaden their knowledge bases by forming alliances with partners with whom they have no prior ties. Therefore, absorptive capacity enhances receptivity to external knowledge and enables firms to apply and internalize the knowledge learned from partners (Mowery et al., 1996).
Recently, Lane et al. (2006) further conducted a detailed analysis of key absorptive capacity papers and developed a more detailed new definition of absorptive capacity. They argued that it is a firm's ability to utilize externally held knowledge through three sequential processes: (1) recognizing and understanding potentially valuable new knowledge outside the firm through exploratory learning, (2) assimilating valuable new knowledge through transformative learning, and (3) using the assimilated knowledge to create new knowledge and commercial outputs through exploitative learning. Accordingly, we propose that interfirm's absorptive capacity requires collaborative partners that have sufficient knowledge or information to facilitate sharing and learning and to provide something of worth.
Coordination capability Coordination capability refers to the capacity to find a knowledge-intensive interface with other firms and organizations (Grant, 1996a). It also refers to the ability of firms to synchronize resources and tasks to create superior new ways of performing collaboration activities (Ettlie and Pavlou, 2006). Coordination capabilities enhance knowledge exchange across disciplinary and hierarchical boundaries (Matusik, 2002), and further bring together different sources of expertise and increase lateral interaction between areas of functional and component (Jansen et al., 2005). In so doing, coordination capabilities are mainly conceived as internal, that is relating tasks and activities within the boundaries of the firm.
Relational capability Relational capability refers to the ability of firms to forge, develop, and govern partnerships (Dyer and Singh, 1998). It also means the ability to select the right partners, and to establish and maintain relationships with other firms. Capaldo (2007) argued that the debate on relational capabilities is still in its infancy. However, as previously noted (e.g., Johnson et al., 2004; Lane et al., 2006), firms build their knowledge bases from internal and external sources, they must build effective relational capabilities to acquire external knowledge and to diffuse internal knowledge across the organization. Hence, the essence of relational capability is the integration of domain-specific expertise and tacit knowledge with external

partners. Further, according to the "relational view", setting-up firm networks, signing-up partnership agreements with other organizations, managing the ensuing relationships, or simply involving customers and suppliers in their business operations would increase the relational capabilities of the firms involved. Therefore, firms with larger and higher quality of relational capability are more likely to have stronger relationship with their partners.

IV. Conclusion:

Our primary objective in this paper is to highlight how innovation activities of firms are influenced in important ways by the interorganizational behaviors. We argue that incorporating interfirm co-development competency into our analysis leads to a more comprehensive view of the strategic behavior of firms. Traditional strategy research has viewed firms seeking to build resources and possess market positions that lead to sustainable competitive advantage (e.g., Barney, 1991; Ray et al., 2004). An understanding of consequences of the interfirm co-development competency emphasizes that firms are more properly connected to each other in an open innovation environment of resources to facilitate e-service innovation. The article identifies one potential integration mechanisms that exist for IT managers: TIMs. Thus, three specific questions are examined: 1). How does interfirm co-development competency impact e-service innovation? 2). How do TIMs mediate the relationship between interfirm co-development competency and e-service innovation? 3). How do TIMs, and partner match moderate the relationship between interfirm co-development competency and e-service innovation?

To answer these questions, this study compasses eight research hypotheses by drawing from RDT, strategic innovation theory, and contingency theory that must be examined in order to ensure successful possess interfirm co-development competency, in turn, to implement e-service innovation. The study suggests that the mediation effects of TIMs on e-service innovation may vary across different industries. Further, the opposite moderation effects of TIMs, and partner match on e-service innovation reinforce the potentially contingency theory, requiring a more sophisticated managerial approach to e-service innovation across industries.

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