IT Impacts On Performance Of Service Firms Through Operation-Level Dynamic Capability

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ABSTRACT

This study focuses on the strategic value of information technologies in the service industry and examines the relationship between information technology (IT) service competence and firm performance. The proposed relationship is further augmented by investigating the mediating role of operation-level dynamic capability particularly for the service setting. Survey data of medium to large-size enterprises in service industries in the United States were used to validate the proposed model. The results indicate that operational reconfigurability as an operation-level dynamic capability is a significant IT-enabled mediating driving force of firm performance in the service setting. This study is an early attempt to examine the strategic value of information technologies to lead to service firms' business performance, particularly through the dynamic capability at the operation level.

Keywords: Operation-level Dynamic Capability; IT Competence; IT Resources; Firm Performance

INTRODUCTION

Globalization and the advancement of information technologies have produced an intensely competitive, dynamic, and unstable business environment. This competitive landscape is often shaped by escalating competition and strategic maneuvering based on price-quality positioning, attempts to establish market advantage, and pressure of new knowledge creation (McNamara et al., 2003). For example, industries, such as electronic goods and finance, face challenges by short life cycle of products and rapid technology diffusion.

Dynamic capabilities, "firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments" (Teece et al., 1997, p. 516), have been proposed as a solution to such changing and uncertain environment (Eisenhardt and Martin, 2000; Pavlou and El Sawy, 2006). Various types of dynamic capabilities has been examined in the literature, such as organizational learning capability (Tippins and Sohi, 2003), cross-functional capability (Grant, 1996), and agility (Sambamurthy et al., 2003). In the literature, information technologies have been discussed as an enabler of these dynamic capabilities (e.g., Sambamurthy et al., 2003; Tippins and Sohi, 2003; Zahra and George, 2002). In particular, Sambamurthy et al.'s (2003) seminal paper provides a theoretical foundation for understanding the nomological network of influence among organizational IT, dynamic capability (specifically agility), and competitive outcomes. In this study, we focus on dynamic capability in business operations and IT impact on this capability.

During the last two decades, operation-level dynamic capability has received considerable attention in the manufacturing industry (Narasimhan et al., 2006). In manufacturing settings, dynamic capability has been emphasized in terms of leanness and flexibility of operational processes, such as resource procurement, manufacturing, quality control, and product delivery (Burgess, 1994; Ettlie, 1998; Llorénsa et al., 2005). This capability has been discussed as a driving force for firms' exploitation of changing market opportunities, thus leading to competitive market position. Research on operation-level dynamic capability in service industries,

however, remains sparse while there has been a pressing need to cope with the growing and evolving service sector of the economy (Roth and Menor, 2003).

The service industry is different from manufacturing in many ways. As pointed out by Roth and Menor (2003), business processes in manufacturing firms affect consumers mainly through their products, which are usually physical goods. Hence, in the manufacturing settings, firms are usually restrained by physical constraints, such as locations, resource availability, and delivery time. In contrast, the service offerings and delivery involve processes enhanced by support amenities, facilitating information, and implicit services, e.g., psychological benefits (Menor et al., 2001). Moreover, while the direct interaction with customers in the service settings makes it easier to collect market intelligence, the customers' demands are more complex and likely to change due to the dynamics of direct interaction with individual customers (Roth and Menor, 2003). Due to the rapidity of change in competition, market dynamics, and customer preferences, the breadth and pattern of responses required in the service settings are much broader, more frequent, and sometimes more unpredictable (Menor et al., 2001). However, little has been done to understand operation-level dynamic capability in the service industry. Menor et al. (2001) investigated agility in banks. However, by treating this dynamic capability as a one-facet concept in their study, they could not fully explain the role of operational capabilities in competitive performance of service firms. Due to the lack of research on operation-level dynamic capability in the service industries, the role of information technologies as an enabler for this significant dynamic capability and business performance of service firms is also unclear.

In this research, we address these knowledge gaps by answering the following research questions: 1) How does IT competence lead to business performance of service firms?, 2) What is the operation-level dynamic capability as a mediating force between IT competence and firm performance in the service settings?, and 3) As essential assets in current business, what are the components of IT competence that supports the operation-level dynamic capability?

RESEARCH MODEL AND HYPOTHESES

Figure 1 shows the research model of the study.

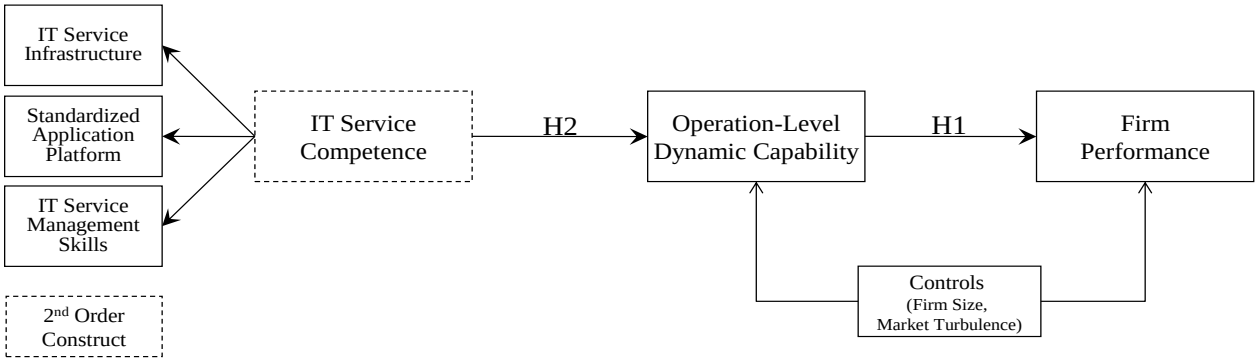

Figure 1: Research Model

Operation-Level Dynamic Capability and Firm Performance

The notion of dynamic capability has been discussed extensively in the literature. There is a general agreement that when facing a turbulent environment, firms must adapt to changes. Otherwise, they lose their competitive advantages (D'Aveni et al., 2010). In service industries where competition is getting more severe, a key business competence is to acquire market information and dynamically respond to changes in an effective and timely manner (Overby et al., 2006). Prior research has proposed such dynamic capabilities from different organizational aspects, such as resource integration (Grant, 1996), organizational learning (Tippins and Sohi, 2003), new product development (Eisenhardt and Martin, 2000), and agile response (Sambamurthy et al., 2003). For

example, Sambamurthy et al. (2003) describe enterprise agility as one of the important dynamic capabilities in a turbulent environment, which is defined as "the ability to detect opportunities for innovation and seize those competitive market opportunities by assembling requisite assets, knowledge, and relationships with speed and surprise" (p. 245). Similarly, Eisenhardt and Martin (2000) define dynamic capability as the "processes to integrate, reconfigure, gain, and release resources to match and even create market change" (p. 1107). According to these definitions, dynamic capability applies to both strategic and operational levels within a firm.

In this study, we focus on dynamic capability at an operational level, namely *operation-level dynamic capability*, which is defined as the ability of a firm to perform a coordinated set of operations dynamically integrating and reconfiguring organizational resources (Helfat and Peteraf ,2003; Pavlou and El Sawy, 2006). It emphasizes the effectiveness and efficiency of a firm's actions in response to changes in their daily operations. In particular, we focus on *reconfigurability* as a primary aspect of operation-level dynamic capability.

Operational reconfigurability refers to the ability of firms to transform and reconfigure their resources and processes in order to accommodate changes in their operations (Pavlou and El Sawy, 2006). Transformation and reconfiguration of resources are catalysts for change. Operational reconfigurability allows a firm to deploy new configurations of functional competences that better match the environment (Pavlou and El Sawy, 2006) and ensures that the firm can rapidly redesign and modify existing processes for new market conditions (Sambamurthy et al., 2003). Firms' ability to integrate and combine existing resources into "novel" combinations to better match their product-market areas helps them respond to changes and deliver new services effectively and efficiently through their daily operations. Therefore, this operation-level dynamic capability is deemed critical to business.

Moreover, when considering the diversity of customer preferences, need of immediate response to customers, and rapid change of market need and competition in service industries, the significance of operation-level dynamic capability in service settings is believe more true. In such fast-cycle industries, operation-level dynamic capability has been discussed to lead to more competitive actions in a rapid pace leading to an improved business performance (Meyer, 2001; Sambamurthy et al., 2003; Weill et al., 2002). In contrast, lack of operation-level dynamic capability, i.e., reconfigurability of operational resources and processes, implies a lack of responsiveness to the environment and the presence of inappropriate, outdated business activities and processes, thus resulting in poor performance. Therefore, especially in service industries where uncertainty and unpredictability are normal, the performance of a firm highly depends on its operation-level dynamic capability. Based on these arguments, we propose our first hypothesis as follows:

Hypothesis 1: A higher level of operation-level dynamic capability will lead to a higher level of firm performance in service settings.

IT Service Competence and Operation-Level Dynamic Capability

IT is fundamental to the growth of a business. IT has the potential to provide competitive advantages for businesses. However, IT *per se* may not generate a sustainable advantage since it can be easily acquired and imitated (Carr, 2003). Also, investments in IT may not result in better firm performance since some IT investments can be wasted (Davern and Kauffman, 2000). Instead, the implementation of IT competence, the extent to which a firm is knowledgeable about and effectively utilizes information technologies within specific business contexts, can create competitive advantage (Tippins and Sohi, 2003).

Recent researchers argue that the relationship between IT competence and business values can be deconstructed through the presence of business competences. For example, Soh and Markus (1995) examine the need for effective deployment of appropriate IT assets to create business value. They argue that the effective use of these IT assets leads to intermediate effects, such as better business competences and processes, which, in turn, influence firm performance. Similarly, Ravichandran and Lertwongsatien (2005) argue that IT capabilities which support core competences of the firm, such as market access competence, integrity-related competence, and functional-related competence, can contribute to better performance. Tippins and Sohi (2003) confirm that business competences, such as organizational learning capability, mediates the relationship between IT competence and performance. These studies emphasize the importance of understanding the relationship between IT competence and business competences when understanding how IT influence business performance.

In this study, we argue that *IT service competence*, defined as the extent to which a firm can effectively utilize IT to support their businesses and facilitate operation, plays an important role in enhancing business performance by improving operation-level dynamic capability. We conceptualize IT service competence as a second-order construct, formed by IT service infrastructure, standardized application platform, and IT service management skills.

IT service infrastructure is the sharable technical and common enterprise-wide platform, such as networking, database services, and standardized operation support, which enables initiatives, such as cycle time improvement and cross functional processes (Bharadwaj, 2000). As the foundation of shared IT capabilities upon which the entire business depends, IT service infrastructure is crucial to business operations (Byrd and Turner, 2000). It links business units, implements common transaction processing, expedites business operations, allows to quickly access and share business data across the firm, and creates synergies across business units (Ravichandran and Lertwongsatien, 2005). A non-integrated IT infrastructure can severely restrict an organization's business choices and slow down business process, thus hindering operation-level dynamic capability.

Standardized application platform refers to enterprise-wide integrated software application platform and standard IT applications (Bharadwaj, 2000). Developing standards for IT platform has been considered a priority in both research and professional communities (Markus et al., 2006). By providing uniform technical specifications, interfaces and criteria, it makes it easier to integrate new IT components and improve synergies between work units. It also has been long recognized that modularization is a good software development practice (Ravichandran and Lertwongsatien, 2005). It constructs software from separate parts, called modules, that separate logical boundaries between components. Such approach allows easy modification for new business processes and integration of new technologies with existing platforms, thereby allowing the IT unit to deliver new capabilities quickly and cost effectively, and thus improving operation-level dynamic capability.

IT service management skills refer to the skill set of IT personnel to manage IT resources to deliver organizational IT services (Tippins and Sohi, 2003). It includes knowledge and experiences of IT workers in dealing with daily operation of information systems, handling requests from business users, and monitoring performance of information systems to ensure that they meet business needs. Strong IT service management skills can help communication between the IT division and business users, integrate IT and business processes effectively, improve reliability and quality of IT, reduce cost of development and maintenance, and decrease delivery cycle time (Bharadwaj, 2000; Byrd and Turner, 2000). Therefore, IT service management skills are important part of IT service competence in the context of operation-level dynamic capability.

In all, we argue that IT service competence formed by IT service infrastructure, standard application platform, and IT service management skills can support and enhance operation-level dynamic capability. Since service firms are characterized with great demand of information processing and business intelligence regarding their customers and market (e.g., Menor et al., 2001), this positive impact of IT service competence on operation-level dynamic capability will find further support in the context of service firms. Based on these arguments, we propose our second hypothesis as follows:

Hypothesis 2: A higher level of IT service competence will lead to a higher level of operation-level dynamic capability in service settings.

RESEARCH METHOD

Measurement Development

The measurement development process involved three stages: 1) operationalization of research constructs, 2) item development, and 3) validity tests. First, research constructs were operationalized based on the definition of each construct, as well as of relevant constructs in the literature. Second, every attempt was made to make use of existing measurements that have good psychometric measurement properties. Modifications of the existing items were also made to suit the context of the study. Table 1 provides a summary of the measurement items used in this study and their sources.

Table 1: Measurement Sources for Research Constructs

Constructs	Summary of Measurement Items and References Sources
Firm Performance (FPF)	Competitive measures of customer retention, sales growth, profitability, and return on investment (Tippins and Sohi, 2003)
Operational Reconfigurability (ORC)	Organization capability to quickly reallocate resources, combine existing resources, and timely redesign / reconfigure business processes (Pavlou and El Sawy, 2006)
IT Service Infrastructure (ISI)	Technology infrastructure to electronically link business units and partners, technology infrastructure to expedite business operations, network capacity and speed, and corporate data access (Ravichandran and Lertwongsatien, 2005; Weill et al., 2002)
Standardized Application Platform (SAP)	Application infrastructure to allow reuse, modularization, integration, and standardization of common application components (Bhatt and Grover, 2005; Lee et al., 2008)
IT Service Management Skills (SMS)	IT staff's skills to prioritize and manage IT service requests, possession of well-defined service quality criteria for IT support, and possession of performance standards (Tippins and Sohi, 2003)
Firm Size (SIZ)	The number of full-time employees (Tanriverdi, 2005)
Market Turbulence (MTB)	The degree of change in customer preference and market competitions, such as new products and promotions introduced by competitors (Pavlou and El Sawy, 2006)

Research Design

We conducted a large-scale cross-sectional survey with firms in service industries in the United States. The United States has experienced a fast growth of service industries and a nation-wide industrial transformation from manufacturing to service. Hence, it is considered as a viable background for examining the research framework of this study.

After the target samples were defined[1], a cross-sectional survey was conducted using a web-based survey tool. Survey invitations were made to business executives – the president, chief executive officer, chief operating officer, and business director of the sample firms in the target industries - who are believed appropriate to answer our questionnaires involving business performance, operational capabilities, and IT competences. Around 700 executives in an industrial respondent pool were invited to participate in this survey and a total of 116 complete data samples were achieved after removing small companies, incomplete data, and sample from IT executive positions. The final data represents five service-industry types, including healthcare services (59), banking/insurance (38), consulting (16), marketing (2), and accounting (1). Their firm size varies; less than 250 (48), between 251 and 1,000 (17), and more than 1,000 (51).

RESULTS AND DISCUSSIONS

Partial least squares (PLS), a structural equation modeling technique, was used to analyze the data. This technique does not require a large sample size (Chin, 1998). In addition, it is appropriate for early stages of theory development (Howell and Higgins, 1990). Given that this study is an early attempt to develop a theoretical model that explains how a firm's competence in IT services enables its operation-level dynamic capability and in turn leads to firm performance, PLS was considered to be appropriate for this study.

Measurement Model Evaluation

The validity of the measurement model was established prior to testing the structural model (Byrne, 1998). The convergent validity of the reflective measures is determined in three ways: 1) the item reliability of each item, 2) the composite reliability of the construct, and 3) the average variance extracted (AVE) by the construct. Based on the results reported in Table 2, it was concluded that all the items demonstrated adequate convergent validity.

[1] A series of criteria congruent with the context of the study were applied for the selection of the target samples. First, we focused on service industries which, to a significant extent, require IT support for their business operations. Second, we excluded companies with fewer than ten employees because such small companies are not appropriate for investigating capabilities in operations and IT service.

Table 2: Result of Convergent Validity Test

	Mean	S.D.	Item Reliability	Composite Reliability	AVE
Firm Performance				0.882	0.653
FPF1	5.302	1.464	0.672		
FPF2	4.595	1.468	0.847		
FPF3	4.440	1.523	0.835		
FPF4	4.483	1.411	0.863		
Operational Reconfigurability				0.941	0.799
ORC1	4.328	1.407	0.887		
ORC2	4.707	1.272	0.892		
ORC3	4.284	1.394	0.879		
ORC4	4.422	1.469	0.916		
IT Service Infrastructure				0.941	0.800
ISI1	4.328	1.614	0.873		
ISI2	4.310	1.590	0.881		
ISI3	4.397	1.693	0.905		
ISI4	4.388	1.619	0.919		
Standardized Application Platform				0.925	0.756
SAP1	4.509	1.212	0.826		
SAP2	4.319	1.336	0.892		
SAP3	4.060	1.434	0.906		
SAP4	4.147	1.428	0.852		
IT Service Management Skills				0.939	0.795
SMS1	4.448	1.601	0.862		
SMS2	4.224	1.610	0.865		
SMS3	4.259	1.616	0.923		
SMS4	4.172	1.482	0.914		
Market Turbulence				0.871	0.693
MTB1	4.328	1.773	0.754		
MTB2	5.034	1.344	0.890		
MTB3	4.819	1.629	0.848		

S.D.: Standard Deviation

Table 3 shows that the square root of the AVE for each construct was larger than the correlations between itself and the other constructs. This implies that each of the constructs shared greater variance with its own block of measures than with other constructs representing a different block of measures (Chin, 1998). Therefore, this result demonstrates that there is good discriminant validity for the items used in this study.

Table 3: Result of Discriminant Validity Test

	FPF	ORC	ISI	SAP	SMS	MTB	SIZ
Firm Performance (FPF)	**0.808**						
Operational Reconfigurability (ORC)	0.447	**0.894**					
IT Service Infrastructure (ISI)	0.186	0.413	**0.894**				
Standardized Application Platform (SAP)	0.324	0.414	0.730	**0.869**			
IT Service Management Skills (SMS)	0.239	0.231	0.551	0.628	**0.892**		
Market Turbulence (MTB)	0.241	0.155	0.258	0.310	0.252	**0.832**	
Firm Size (SIZ)	0.001	-0.248	-0.079	-0.058	0.051	0.058	**1.000**

Structural Model Analysis

The explanatory power of the PLS structural model was assessed through the amount of variance explained by the exogenous constructs. The estimated path effects and the associated t-values were calculated using the Bootstrapping routine in SmartPLS 2.0 (Ringle et al. 2005). Since IT service competence was formulated as second-order construct, the latent scores for each of the first-order constructs were calculated and used as measures for each construct (Chin and Gopal, 1995). Figure 2 shows the results of the model analysis.

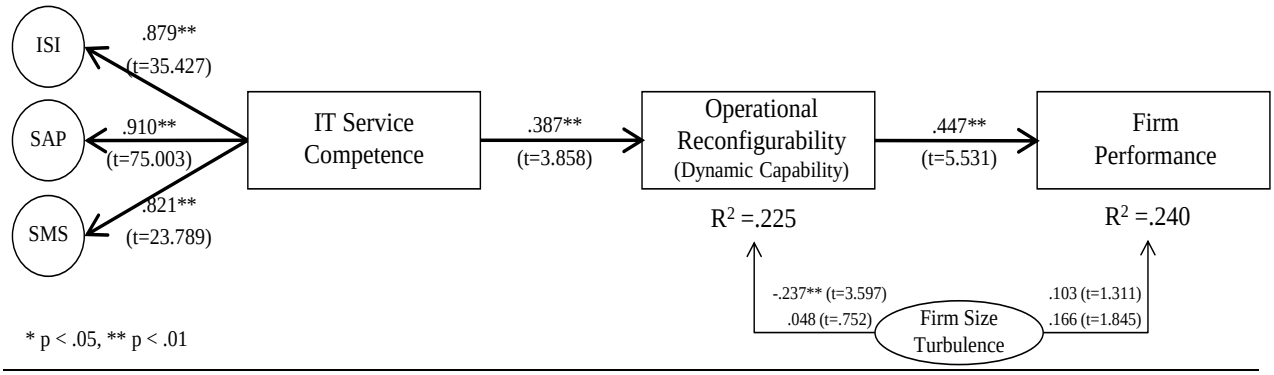

Figure 2: Research of Model Test

As shown in Figure 2, all paths were significant. The operation-level dynamic capability was found to be a significant determinant of firm performance (at the 0.01 level). It explained 24% of the variances of firm performance. On the other hand, the IT service competence was also found to be a significant determinant of the operation-level dynamic capability (at the 0.01 level). It explained 22.5% of the variances of operation-level dynamic capability. All second-order loadings for the latent IT service competence construct (loadings of the 1st order constructs) were highly significant (at the 0.01 level). Therefore, hypotheses H1 and H2 are supported. Interestingly, firm size - the control variable - was negatively significant in determining operation-level dynamic capability (at the 0.01 level) while all other controls were not significant.

Implications

The results indicate that a specific set of IT resources forms service organizations' IT competence to support business needs, hence leading to a higher level of dynamic capability in their operations. In turn, this operation-level dynamic capability positively influences the competitive performance of the firms. To confirm these causal relationships among IT service competence, operation-level dynamic capability, and firm performance, we further conducted a post-hoc analysis of mediator test. We followed the procedures of Baron and Kenny's (1986) mediation test and Sobel's standard errors test (1982). Baron and Kenny's four steps consist of testing: 1) the significant effect of IT service competence (IV) on firm performance (DV) without operation-level dynamic capability (MV), 2) the significant effect of IT service competence (IV) on operation-level dynamic capability (MV), 3) the significant effect of operation-level dynamic capability (MV) on firm performance (DV), and finally, 4) the insignificant effect of IT service competence (IV) on firm performance (DV) in the co-presence of operation-level dynamic capability (MV). If the results satisfy all four steps, the MV is a full mediator between the IV and the DV. On the other hand, if the final step is not satisfied, the MV is only a partial mediator. Table 4 shows the results of our mediator test.

Table 4: Results of Testing for Mediating Effects

Baron and Kenny Test				Sobel Test
Step 1. IT Service Competence to Firm Performance (without mediator)	Step 2. IT Service Competence to Operation-Level Dynamic Capability	Step 3. Operation-Level Dynamic Capability to Firm Performance	Step 4. IT Service Competence to Firm Performance (with mediators)	Mediation Effect (t)
β_c=0.254* (t=2.667)	β_a=0.396** (t=4.037) SE_a=0.098	β_b=0.418** (t=4.209) SE_b=0.099	$\beta_{c'}$=0.074 (t=1.011)	0.166** (t=2.919)

β = path coefficient, SE = standard error of β
* < .05, ** < .01

The Sobel test results in Table 4 show the significant mediation effect of operation-level dynamic capability between IT service competence and firm performance (at the 0.01 level). The results indicate that operation-level dynamic capability is the full mediator between IT service competence and firm performance. Therefore, the post-hoc analysis results also confirm our research model proposed in this study.

Our study shows that a firm's IT service competence, formed by IT service infrastructure, standardized application platform, and IT service management skills, is a significant driving force for the firm's dynamic operations which are represented by its flexible resource and process reconfiguration. The findings are consistent with Bharadwaj's (2000) perspective that a firm's IT resources, technology and human IT resources, are the sources of its latent capacity to build and provide the requisite IT services. Furthermore, the findings also provide an empirical evidence of the conceptual premise that IT is a digitized platform of organizational dynamic capabilities (Sambamurthy et al., 2003; Zahra and George, 2002). The study also shows that IT-supported operation-level dynamic capability significantly leads to a better performance of service firms, particularly in terms of sales growth, profitability, return on investment, and customer retention. The findings are consistent with the premise of capability hierarchy perspective (Grant, 1996) which suggests that the higher-level dynamic capabilities (i.e., operation-level dynamic capability, in our case) are better determinants of organizational outcomes than the lower-level functional capabilities (i.e., IT service competence, in our case).

When considering the context of the study; i.e., the service industries, the findings are deemed important as well as useful to both academics and practitioners. Traditionally, the value of operation-based capabilities has been discussed in manufacturing settings. For example, many techniques of operational leanness and flexibility have been suggested under the settings of manufacturing, such as just-in-time manufacturing (JIT), total quality management (TQM), and lean manufacturing (Burgess, 1994; Ettlie, 1998; Llorénsa et al., 2005). However, with regard to the recent catastrophe in the financial industries in the United States, it is likely to be more true that operational capabilities, such as operation-level dynamic capability, are crucial for firm success under the settings of service industries.

CONCLUSION

In this study, we concentrated on the service industries and theoretically proposed a positive relationship among IT service competence, operation-level dynamic capability, and firm performance. To capture the combinative values of IT resources which form IT service competence, the second-order approach was adopted in conceptualizing the core research construct. Survey data of medium- to large-size enterprises in service industries of the United States were used to validate the proposed model. The results indicate that operation-level dynamic capability, particularly operational reconfigurability, is a significant driving force of firm performance. The results also indicate that IT service competence, consisting of IT service infrastructure, standardized application platform, and IT service management skills, serves as a base for the operation-level dynamic capability.

This study has several limitations which involve cross-sectional research design and single respondent survey approach. First, this study used a cross-sectional research design. Such a snap-shot approach may have limitations in terms of studying the causal relationships or time effects between research variables, such as the lead-time of the IT impact (Bharadwaj, 2000). Second, single respondent bias has been discussed as a potential source of common method variance (Podsakoff and Organ, 1986). To avoid this, various techniques have been suggested in the literature, such as separating survey questionnaire to ask specific expertise with different positions (Lee et al., 2007). While our sample data are not thought to suffer from this issue[2], multiple-respondent survey may provide more generalizable findings.

Regardless of the aforementioned limitations, this study makes several contributions to the literature. First, this study, both theoretically and empirically, reveals how firms can develop their operational reconfigurability as an operation-level dynamic capability. The findings of the study indicate the significant role of IT competence in achieving this specific type of dynamic capability. Since prior studies in IT-enabled organizational dynamic capabilities are still lacking in providing empirical evidence, the theory-based models and the empirical findings of

[2] Harman's single-factor analysis was conducted to test a potential of common method variance in our sample data. This test involves an exploratory factor analysis (EFA) of all measurements to determine whether the majority of the variance is accounted for by one general factor. The principal component analysis using promax rotation revealed that a total of five distinct factors emerged with Eigen value of over 1. The results revealed that each of the five principal components explained similar amounts of the total variance of 71%, ranging from 10% to 19%. This result indicates that our data does not suffer from common-method bias as indicated by Podsakoff et al. (2003).

the study are both interesting and useful to academics in this research area. Second, this study has a potential contribution to the literature by addressing an unexplored, yet emerging issue of the role of operational capabilities in service industries. While most of prior studies in operational capabilities have focused on the settings of manufacturing industries, both academics and practitioners are becoming more interested in the role of operations in service settings (Heineke and Davis, 2007; Machuca et al., 2007). This study is an early attempt to demonstrate the significant role of operational capabilities in service firms and thus the findings in this study may open a new area of discussion among academics and practitioners. Lastly, through this study, we develop new measurements having good psychometric properties. The measurements used in this study can serve as a base for further research in this research area. This study also has some practical contributions by providing guidance for practitioners to strategically invest their IT resources to achieve their dynamic capability at operational level.

This study can be extended in several directions. First, this study mainly focuses on operation-level dynamic capability in the service industries. Future research can examine another type of dynamic capability, such as strategic-level capabilities and agility. Second, this study investigates IT service competence, including IT service infrastructure, standardized application platform and IT service management skills. Future research can continue to study IT skills of business users that may also have influence on organizational dynamic capabilities. Third, the unit of analysis of this study is the organization. It evaluates high-level dynamic capability of a firm and its impact on the performance of the firm. However, in some large organizations, some divisions may be more capable than others. Future study can explore the topic at department or team levels. Fourth, our study adopts the survey methodology and measures the performance of an organization using historical/present data. Future research can develop a longitudinal study following the effectiveness of business capabilities.

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