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EFFECT OF IT CAPABILITY ON THE ALIGNMENT BETWEEN BUSINESS AND SERVICE INNOVATION STRATEGIES

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Abstract

Information Technology (IT) capability is believed to encourage and facilitate service innovation. In addition, since effective competitive strategy is particularly important for service firms, it is imperative to align their service innovation strategy with their business strategy to achieve better firm performance. Many service innovation studies have been performed on the influence of IT capability and the strategic alignment separately in the past, but this study combines them by investigating the moderating effect of IT capability on the alignment between business and service innovation strategies. Based on empirical data collected from 183 service firms in Korea, this study aims first to explore whether a certain service innovation strategy is more effective with a particular business strategy for better firm performance. We then investigate the moderating effect of IT capability on the relationship between the strategic alignments and firm performance. The empirical evidence indicates that there is a synergistic effect between strategic alignment and IT capability on firm performance. Firms that have aligned service innovation strategy with business strategy need to consider the improvement of organizational IT capability with an assurance that they will be leveraged substantially. Lastly, we discuss our study's implications for further research and practice.

Keywords: Service innovation, Service innovation strategy, Business strategy, Information technology capability, Moderating effect, Alignment, Firm performance.

1. INTRODUCTION

The impact of service innovation on competitive advantage and business performance has increased noticeably during the last decade. As the growing importance of service innovation is now widely recognized, service firms frequently face a significant gap between their innovation competency and management skills when striving to realize the potential of service innovation. Research on service innovation has played a critical role in minimizing the existing gap in terms of a strategic view.

Although subsequent works have attested to the importance of service innovation within innovation management, such works often failed in implementing successful service innovation activities because only a limited number of service firms take a formal approach to service innovation (Homburg et al., 2003). According to Neu and Brown (2005), firms that successfully develop their services align their innovation strategy with environmental conditions of their service business. A misaligned service innovation decision can result in the loss of competencies and capabilities, exposure to unexpected risk, and even business failures. Therefore, the critical challenge facing firms for service innovation success is how to effectively organize and manage well-planned service innovation practices in a way that remains consistent with the business strategy from the beginning of service innovation.

Furthermore, the strategic role of Information Technology (IT) capability requires consideration of the potential implications of efficient linkage between business and service innovation strategies to develop coherent and integrated strategies. The impact of IT capability is realized mainly in combination with other organizational factors such as business strategies, business goals, time to market, strategic alignment, and so on (Barua and Mukhopadhaya, 2000; Brynjolfsson and Hitt, 2000; Milgrom and Roberts, 1995). IT capability is a critical factor in facilitating and realizing service innovation strategy (Sundbo, 1997; Den Hertog, 2000; Gago and Rubalcaba, 2007; Bygstad and Lanestedt, 2009). In service innovation, IT capability is a means of creating favorable conditions for developing better services and achieving more profitable business deals. It means that firms pursuing the effective linkage of business and service innovation strategies need to pay attention to IT capability because IT capability is a key contextual factor to explain better the strategic alignment between both strategies.

Therefore, this study aims to 1) *identify whether a certain service innovation strategy is more effective with a particular business strategy for better firm performance* and 2) *investigate the effect of IT capability with the alignment between business and service innovation strategies on firm performance*. We explore the performance implications of the strategic alignment between business and service innovation strategies through IT capability based on the typologies of Porter (1980) (e.g., cost leadership, innovative differentiation, and focus strategies) and the service innovation dimensional model of Den Hertog (2000) (e.g., service creation-focused, service delivery-focused, and customer interaction-focused strategies). The examination of the proposed alignment with IT capability is based on empirical data from 183 Korean service firms that have conducted service innovation during the last three years.

As far as we understand, this study is one of the early attempts to theoretically build feasible sets of internal congruent patterns between business and service innovation strategies by stressing the role of IT capability and to empirically investigate their synergy relationships. Our findings reveal that IT managers should pay more attention to strategic-level issues in terms of how IT capability can help better align service innovation strategy with business strategy, which provides valuable information to managers who seek practical guidance for successful service innovation.

2. THEORETICAL BACKGROUND

2.1 Business strategy

A strategy is the mechanism that guides environmental alignment and provides integration for internal

operation (Snow and Hambrick, 1980). Porter (1980) argued that implementing strategies successfully requires different resources and skills. Organizations have to develop and maintain an appropriate alignment with their environment to flourish in the market (Milgate, 2001; Weill et al., 2002). In strategic management literature, the typologies of Miles and Snow (1978) (i.e., prospector, defender, analyzer, and reactor) and Porter (1980) (i.e., cost leadership, differentiation, and focus) have emerged as the two dominant typologies of business strategy. While both typologies have been used extensively and found to be robust, the typology of Porter (1980) found greater acceptance in innovation research (Kellogg and Nie, 1995; Yamin et al., 1997; Blazevic and Lievens, 2004). Fitzsimmon and Fitzsimmon (2006) suggested that firms could understand the competitive environment of service firms within three generic competitive strategies, namely, cost leadership, differentiation, and focus strategies. Thus, we used the strategy typology of Porter for the purposes of this study. Although Porter did not distinguish among differentiators, Miller (1986, 1988) split this differentiation strategy into innovative and marketing based on their different structural implications. Given the relative effectiveness of alignment, we excluded marketing differentiation strategy in our study. Consequently, this paper follows the typology of Porter (1980) as business strategies, which are *cost leadership, innovative differentiation, and focus strategies*.

2.2 Service innovation strategy

Griffin (1997) and Cooper et al. (1999) stressed the importance of clearly defining a new product and service strategy in guiding the innovation process. They claimed a successful innovation needs tangible and visible top management support for innovation, especially for consistent strategies. Griffin (1997) explained that innovation strategy in service development process is more critical to higher performance than in the product development process in manufacturing because it is easier for others to imitate and copy services than manufacturing products. Service innovation strategy should position the appropriate role of innovation within the overall business strategy and enable managers to plan for and to make available adequate resources for specific innovation efforts (Menor and Roth, 2007). Therefore, the service innovation strategy reflects a direction or a guideline of decisions in the service innovation activities of a firm. In this study, we define, from management theory, service innovation strategy as “*the logic visible in a firm’s portfolio of service innovation decisions.*” This logic may serve as the guide to decisions regarding the specific service innovation activities or may simply be revealed in the cumulative pattern that is visible in individual service innovation decisions. Thus, service innovation strategy is not only a consciously made single decision, but also a manifestation of multiple decisions.

As a next step, we need to identify the innovation decisions that are salient in constituting or reflecting a service innovation strategy. Den Hertog (2000) argued that innovating services indicated several changes within the various service innovation practices as service innovation dimensions in an organization rather than just changing several elements or characteristics of the final service offering stressed by Gallouj and Weinstein (1997). Given that service innovation strategy is a guide to decisions regarding specific service innovation practices, we believe that the concept of service innovation dimension by Den Hertog (2000, 2010) is more suitable to develop service innovation strategy in this study. Den Hertog (2000) defined different innovation activities as service innovation dimensions, and introduced four dimensions of service innovation, namely, service concept, service delivery, client interface, and technology. Service concept refers to the prototype of the service that can offer a new value proposition in a particular market. Innovations in service concept include changes in service characteristics, and cover both descriptions of customer needs and services offered (Edvardssons 1997). Service delivery indicates that the service innovation process comprises the sequential activities and internal organizational arrangement for delivering a new or existing service. Client interface relates to the design of the interface between the service provider and its clients. Technology, although optional in practice, plays an important role as a facilitating or an enabling factor, and is increasingly common in service innovations.

However, these dimensions need to be revised to effectively develop service innovation strategies. First, technology is not regarded as a service innovation dimension, but as a competency in service innovation from the service-dominant view. Second, we changed the term “client interface

dimension” into “customer interaction dimension” in this study. Customer interaction is a more comprehensive term than client interface because the latter is often used with a narrow meaning, which presents a point of contact between customer and service provider. Consequently, to develop service innovation strategy, we adopted three service innovation dimensions, which are service concept, service delivery, and customer interaction. Despite the importance of understanding the effect of service innovation strategy that consists of the three major dimensions, little study has been conducted on the said strategy as either a single decision or multiple decisions. Thus, it is imperative that service innovation strategy is investigated initially as a single decision. For these reasons, we begin by identifying the three major service innovation dimensions, and then develop three different service innovation strategies along the aforementioned dimensions, which are 1) *service creation-focused*, 2) *service delivery-focused*, and 3) *customer interaction-focused strategies*. Table 1 summarizes the characteristics of the three service innovation strategies.

Strategy type Characteristics	Service creation-focused strategy	Service delivery-focused strategy	Customer interaction-focused strategy
Type of innovation	Service concept innovation	Service delivery innovation	Customer-driven innovation
Innovation emphasis	Innovativeness and flexibility of services	Efficiency of service delivery	Effectiveness of communication between customer and provider
Market emphasis	New services	Low price, convenience	Quality of service, Customer satisfaction
Type of offering service	New services (including the change of bundle, package)	Existing services	Existing services
Design flexibility	High(innovativeness)	Low(Standard)	Middle
Price policy	Premium price	Low price	Middle
Service-market volume	Average(Middle)	Very broad(High)	Very narrow(Low)

Table 1. The characteristics of three service innovation strategies

2.3 Role of IT capability

According to IT literature, IT capability is defined as the ability of an organization to effectively acquire, distribute, and leverage IT-related resources (e.g., software, hardware, and IT personnel) and to manage organization information in an integrated manner (Bharadwaj, 2000; Bhatt and Grover, 2005). Theoretically, the idea that IT must be tightly coupled with strategy (e.g., Holland et al., 1992; Porter and Miller, 1985) has been widely known because IT affects strategy, and, in turn, strategies have IT implications (e.g., Bakos and Treacy, 1986). Thus, competitive positioning and the ability to pursue a low cost and/or differentiation strategy depend on IT capability to increase efficiency, quality, innovation, and customer responsiveness (Porter, 1996; Prahalad and Hamel, 2006). In the similar vein, IT capability plays a critical role in encouraging service innovation. IT capability in service innovation is a key facilitator to create more favorable service conditions. Given that IT capability could influence both business and service innovation strategies, the reasonable conclusion is that IT capability might encourage the efficient linkage between both strategies to achieve better firm performance. For example, IT capability could have a closer working relationship between business and service innovation managers through effective strategic systems, which leads to innovation success. Through IT capability, business and service innovation managers are more likely to work in harmony and improve their strategic actions. Accordingly, the benefit of the alignment between both strategies can be attained through IT capability as a strategic lever.

3. THEORETICAL FRAMEWORK

Strategic management literature has long stressed the importance of linkage between corporate and functional levels strategies for firm performance. Firms operating in the same market segment and following similar strategies have dramatically different levels of performance (Cool and Schendel, 2006; Klassen and McLaughlin, 1996). In other words, “good” consistency in strategy and capability

between business and functional levels might lead to superior business performance than “poor” consistency. Service innovation researchers have stressed that the important determinant for service innovation success is the alignment of the innovation strategy with its overall business strategy (Cooper et al., 1999; Sunbo, 1997). Given the significant impact of strategic alignment on the effectiveness of a firm, a strong possibility exists that the alignment between business and service innovation strategies can result in higher economic profits in service firms as well.

In this study, we view business strategy types in terms of the typology of Porter (1980), which includes cost leadership, innovative differentiation, and focus strategies, and develop three service innovation strategies (i.e., service creation-focused, service delivery-focused, and customer interaction-focused strategies) from a service-dominant logic view. We assume that the alignment between business and service innovation strategies is necessary to improve firm performance. We then expect that IT capability has the potential to aid firms in the efficient relationship between both strategies, leading to better firm performance. Based on this idea, the overall research model is summarized in Figure 1.

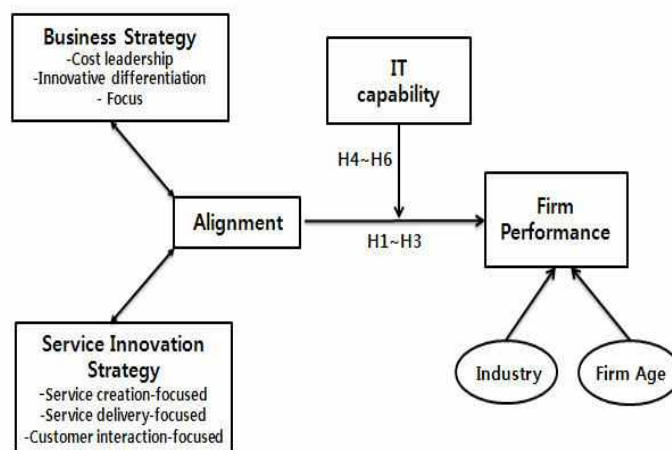


Figure 1. A research model

3.1 Alignment model between business and service innovation strategies

3.1.1 Alignment between innovative differentiation and service creation-focused strategies

Firms adopting an innovative differentiation strategy develop a competitive advantage by innovating and upgrading their products or services, thereby gaining customer loyalty (Porter, 1980). Although emphasizing innovativeness and flexibility leads to a lower operational efficiency and a lack of control, the innovative differentiation strategy places a great deal of effort and investment into developing new products and services, and in searching for new opportunities (Shortell and Zajac, 1990). Service creation-focused strategy involves frequently changing offers for customers and determining how such change should be achieved to create a new market. This strategy should provide customers with a unique value from new services through service-concept innovation. Thus, service creation-focused strategy continuously seeks new opportunities (customer needs) from new innovative services (service offering). Service creation-focused strategy should attempt to align with the competitive intensions of an organization to match customer needs and service offering (Edvardsson, 1997; Dibb et al., 2005; Goldstein et al., 2002). Innovative differentiation strategy can clarify innovation activities and expectations, and reduce conflicts within the service concept innovation, and, hence engage in developing and launching new services as differentiation positions are mostly achieved by introducing new services (Dess and Davis, 1984; Frambach et al., 2003). Thus, service creation-focused strategy can create new service designs and new values of service effectively with the innovative differentiation strategy. Although the service creation-focused strategy takes

several risks in developing new services, competitiveness of firms could improve with innovative differentiation strategy, thereby increasing firm performance. Thus, we hypothesize the following:

H1: *When a service creation-focused strategy is aligned with an innovative differentiation strategy, its impact on firm performance will be greater than others.*

3.1.2 Alignment between cost leadership and service delivery-focused strategies

The cost leadership strategy implies that firms maintain existing market share and improve their cost structure by providing their products or services (Porter, 1980). The competitive aim of cost leadership strategy must essentially involve cost reductions in producing a standardized product (Utterback, 1994; Suarez and Utterback, 1995). Thus, cost leadership strategy focuses mainly on tight control, emphasizes operating efficiency as a means to lower costs (Shin and Chiang, 2005). Service delivery-focused strategy tends to change where, when, and how a service is delivered to the customer to offer differentiated services. This strategy provides customers with greater convenience from an effective delivery process through service delivery innovation. The service delivery-focused strategy often creates the opportunity for firms to reduce cost, time, and effort through a valuable new delivery process (Chen et al., 2009). Accordingly, this strategy provides relatively stable and standard services to increase delivery process efficiency. Thus, the service delivery process should be well planned and systematic for improving operational efficiency and effectiveness. In terms of operational efficiency, service delivery-focused strategy can be more effective with cost leadership strategy because cost leadership strategy has mechanistic and systematic organizational structure as well as higher fixed-asset intensity than other strategies for improving operational efficiency. Thus, the service delivery-focused strategy seems more effective in achieving better firm performance with the cost leadership strategy than with other service innovation strategies. Therefore, our research hypothesis is as follows:

H2: *When a service delivery-focused strategy is aligned with a cost leadership strategy, its impact on firm performance will be greater than others.*

3.1.3 Alignment between focus and customer interaction-focused strategies

The focus strategy attempts to maintain a particular target market by serving the specific needs of customers (Porter, 1980). Firms that utilize this strategy emphasize on a narrowly defined strategic market and a specialized range of products or services. As a result, such firms achieve competitive advantage in its market segment by meeting specific customer needs through specialization (Fitzsimmon and Fitzsimmon, 2006). Firms adopting the focus strategy often develop a specialized understanding of the needs in their market and customer segment through innovation activities. In service innovation, customer interaction-focused strategy concentrates on changes in how deep (customer coproduction) and in the degree (customer contact) customers are involved in service innovation processes such as service design, production, and consumption. This strategy provides customers with high-quality service from reflecting customer demands to its service through customer interaction innovation. Improving the quality of the resulting services and increasing customer satisfaction largely depend on the customer interaction innovation because customers are more satisfied with services through interactions with service providers, and the feedback from customers can shape other innovation activities in service firms (Den Hertog, 2000). The focus strategy is expected to be effective with customer interaction-focused strategy because firms adopting the former can meet and serve the specific needs of their customers through customer interaction activities. Customer interaction-focused strategy is likely to create a closer and more open relationship between customers and service providers to provide customers with high-quality services, which can help focus strategy in serving their specific narrow target market effectively and efficiently than competitors. Hence, the customer interaction-focused strategy leads to better firm performance with the focus strategy. We therefore propose that:

H3: *When a customer interaction-focused strategy is aligned with a focus strategy, its impact on firm performance will be greater than others.*

3.2 Moderating effect of IT capability on Strategic alignment

3.2.1 *Effect of IT capability on alignment between innovative differentiation and service creation-focused strategies*

IT capability can create an organizational environment that promotes creativity and innovation inside, and help organizations adjust to the enormous change outside its own boundaries (Morton, 1988). IT capability facilitates innovation by improving the initial base of knowledge to draw from when employees engage in problem solving and decision-making, and thus, reduce the cost of information search (Dewett and Jones, 2001). Firms with high IT capability can creatively use knowledge, which is the key to developing new products and services and creating competitive advantage (Leavy, 1998). With IT capability, organizations can allocate knowledge resources in an effort to optimize the overall value added of employees, and, in turn, optimize knowledge for developing new services to adjust to market changes. Accordingly, IT capability enables firms to deal with customer needs effectively, and influence the distinct knowledge of employees in developing new services through the integration of systems and tacit skills of human resources. Given the emphasis on different positions that are mostly achieved by introducing new services in both innovative differentiation and service creation-focused strategies, IT capability may help firms focus on innovation effectively within business and service innovation operations. IT capability might deal with customer demands rapidly, and encourage and facilitate the development and launching of new services to improve and to codify the initial base of knowledge, to leverage, to share, and to integrate expert knowledge (Henderson and Venkatraman, 1993), thereby effectively achieving better firm performance (Dess and Davis, 1984; Frambach et al., 2003). For this reason, IT capability might influence the relationship between the alignment of innovative differentiation and service creation-focused strategies and firm performance. Thus, we hypothesize the following:

H4: *The impact of the alignment between innovative differentiation and service creation-focused strategies on firm performance is moderated by IT capability.*

3.2.2 *Effect of IT capability on alignment between cost leadership and service delivery-focused strategies*

Many researchers have stressed the efficiency-enhancing role of IT capability in organizations (Huber, 1990; Henderson and Venkatraman, 1993; Argyres, 1999). IT capability reduces the cost of information processing, and thus makes organizational structures more efficient. Chen et al. (2009) indicated that IT capability is the key driver that leads to the success of service delivery innovation because it might encourage the creation of value that will transform the service delivery process. IT capability enhances the response of a company to customer demands with shorter delivery times (Jackson, 1990), and enables customers to monitor their deliveries (Tinnila and Vepsalainen, 1995), which leads to an increase in customer convenience. Stronger IT capability will better facilitate the creation of a new channel or method of service delivery based on a codified knowledge pool. Specifically, IT capability is more critical in cost leadership and service delivery-focused strategies because firms pursuing the two strategies depend on their ability to increase organizational efficiency. IT capability helps in the linkage between cost leadership and service delivery-focused strategies facilitate by effective coordination across teams and configuration of resources to meet their strategic goals. Therefore, IT capability might have a positive effect on the relationship between the alignment of cost leadership and service delivery-focused strategies and firm performance. Thus, we propose the following hypothesis:

H5: *The impact of the alignment between cost leadership and service delivery-focused strategies on firm performance is moderated by IT capability.*

3.2.3 *Effect of IT capability on alignment between focus and customer interaction-focused strategies*

IT capability reduces the costs of communication and increases the speed of communication, which

enables rapid responses to changes of customer needs, and thus improves customer satisfaction (Henderson and Venkatraman, 1993; Argyres, 1999). The key capabilities of IT are to track and predict changing customer preferences, which enable firms to track shifts in customer choices more rapidly (Bharadwaj, 2000). Interactive IT capability can offer a new channel that allows direct access to customers and customer coproduction for new services (Quinn, 2000). For example, firms can collaborate with customers by forming distinct online communities where the latter can coproduce services with the former. Thus, IT capability can facilitate an effective collaboration between service providers and customers, which offer different resources to encourage customer interaction innovation. Given the importance of fully understanding specified customer needs and facilitating the effective linking between service provider and customers, IT capability might help firms focus on the specific needs of customers and interaction with them, and effectively implement both focus and customer interaction-focused strategies. Hence, IT capability might have a significant influence on the relationship between the alignment of focus and customer interaction-focused strategies and firm performance. Therefore, we propose:

H6: The impact of the alignment between focus and customer interaction-focused strategies on firm performance is moderated by IT capability.

4. RESEARCH METHODOLOGY

4.1 Measurement

We developed our measure items based on an intensive literature review to obtain content validity. First, we used the typology of Porter (1980) for business strategy (i.e., cost leadership, innovative differentiation, and focus). Second, for service innovation strategies, we developed three different strategies along the three major service innovation dimensions of Den Hertog (2000) (i.e., service creation-focused, service delivery-focused, and customer interaction-focused strategies). Multiple-item measures of both strategies were developed and drawn from management and service innovation studies. However, since little guidance exists regarding how to measure service innovation strategies, we developed completely new items according to the steps suggested by Moore and Benbasat (1991). Third, for IT capability, comprehensive multiple-item measures were developed based on prior IT studies that classified IT capability into human IT resources, physical IT infrastructure, and IT-enabled intangibles (Bharadwaj, 2000; Ray et al., 2005; Sircar et al., 2000; Bhatt and Grover, 2005). Fourth, we introduced a non-financial performance as a dependent variable because innovation makes the strongest contribution to non-financial performance (Avolonitis et al., 2001). We developed four perceptual measures to assess the degree of firm performance, namely, responsiveness to customer needs, customer satisfaction, service customization, and corporate reputation improvement (Jaworski and Kohli, 1993; De Jong et al., 2003; Narver and Salter, 1990). Finally, to account for extraneous sources of variation in firm performance, we incorporated industry type and firm age as control variables in our research model. Industry type was classified into six, i.e., transport, communication, computer and software, engineering and architecture, business consulting, and design services, while firm age was measured by the number of years of the existence of a firm (Fichman and Kemerer, 1993).

Prior to the main survey administration, a pilot test was conducted to examine the reliability and validity of the newly developed measures by using a focus group of both operations and service managers from 30 service firms operating in the market. The results of the pilot test led to a significant refinement and restructuring of the questionnaire, and established the initial face and internal validity of the measures. The Korean version of all measures was created by following the translation-back-translation procedure of Brislin (1980). All measures, including business and service innovation strategies, IT capability, and firm performance, were based on a five-point likert-type scale, ranging from “extremely low (1)” to “extremely high (5).” The structure of all measures used in this study is presented in the Appendix (available upon request from the authors).

4.2 Sample and Data collection

For the main survey, we obtained data from Korean service firms by using survey questionnaires. The survey focused on the service innovation and business strategies, and IT capability that the firms had developed within the last three years. Hence, respondents who had implemented at least one service innovation activity in their firms within the reference period of 2008 to 2010 were asked to respond to the full questionnaire. The survey questionnaires were developed for both operations and service managers of each of the 856 firms, who promised to fill out the said questionnaires. Our survey samples were randomly selected from the entire population of service firms based on the 2010 Korean Innovation Survey (<http://kis.steipi.re.kr>). We distributed the questionnaires to 856 firms through e-mail, fax, telephone, and personal interview; and finally received 205 responses. The mean substitution and the complete case approaches were applied to the missing data imputation method. Finally, 183 responses were determined to be useful for this study, which was a usable response rate of 21.4%. Table 2 summarizes the respondent characteristics.

(a) Industry			(b) Firm age		
Industry type	Frequency	Percent	Year	Frequency	Percent
Transport	28	15.3%	Less than 5	25	13.7%
Communication	39	21.3%	6~10	46	25.1%
Computer and software	36	19.7%	11~20	81	44.3%
Engineering and architecture	36	19.7%	21~30	25	13.7%
Business consulting	30	16.4%	30 and above	6	3.3%
Design services	14	7.7%	Total	183	100%
Total	183	100%			

(c) Number of employees			(d) Total sales		
Range	Frequency	Percent	Range	Frequency	Percent
10~29	58	31.7%	Less than \$0.9 mil	26	14.2%
30~49	46	25.1%	\$1~\$9.9 mil.	98	53.6%
50~99	40	21.9%	\$10~\$49.9 mil.	43	23.5%
100~299	24	13.1%	\$50~\$99.9 mil.	6	3.3%
300 and above	15	8.2%	\$100 mil. above	10	5.5%
Total	183	100%	Total	183	100%

Table 2. Sample characteristics (\$: US dollar)

4.3 Measurement reliability and Validity

The content validity of the survey instrument was established through the adoption of a standard instrument and the pretesting of the said instrument with experts in the service sector field. We conducted a factor analysis to reduce the number of uncorrelated factors, and then calculated the measure of sampling adequacy (MSA) for each variable (Hair et al., 1998) to determine whether our data were suitable for the factor analysis. All variables had satisfactory MSA values that exceed the threshold value of 0.5 (service creation-focused=0.627; service delivery-focused=0.655; customer interaction-focused=0.686; cost leadership=0.780; innovative differentiation =0.788; focus=0.727; and IT capability=0.732). Then, Bartlett's test of sphericity was used to determine the overall significance of all correlations within a matrix (Hair et al., 1998). Before the factor analysis, we conducted a reliability test using Cronbach's alpha that is the most widely used test for measuring reliability. All values of Cronbach's alpha ranged from 0.708 to 0.826, which was acceptable. We then used the extraction technique with varimax rotation and identified eight uncorrelated factors for three service innovation strategies, three business strategies, IT capability, and firm performance.

5. ANALYSIS AND RESULTS

5.1 Analytical approach

In general, research addressing the issue of strategic alignment can be classified into six perspectives: fit as moderation, fit as mediation, fit as matching, fit as gestalts, fit as profile deviations, and fit as covariation (Venkatraman, 1989). Each perspective differs in terms of its key characteristics, such as the underlying conceptualization of fit, verbalization of strategy proposition, analytical schemes for testing fit, and so on. The perspective of the strategic alignment in this study is similar to the perspective of *fit as moderation*, which assumes that strategic alignment will lead to an interaction effect between business and service innovation strategies that have implications for performance. Fit as moderation requires multiple regression analysis as an analytical approach (Venkatraman, 1989). Therefore, we used a moderated multiple regression analysis technique to explore not only the synergy effects of each strategic interaction between business and service innovation strategies on firm performance (for H1, H2, and H3) but also the moderating effect of IT capability on the alignment (for H4, H5, and H6). The unit of analysis in our study is the firm level. SPSS software version 12.0 was used to conduct the multiple regression analysis.

5.2 Testing the proposed hypotheses

Table 3 presents the mean, standard deviation, and correlations for all variables used in this study. To resolve problems with the multicollinearity of interaction effects in multiple regression analysis, we used standardization, which reduces the multicollinearity inherent in interaction terms and facilitates the interpretation of coefficients (Aiken and West, 1991; Jaccard et al., 1990). Thus, all correlation of variables was computed after standardization. We also calculated variance inflation factors (VIFs) for our independent variables to test for multicollinearity. All VIF values that have to be below the threshold value of 10 (Hair et al., 1998) were within the acceptable range (i.e., from 1.034 to 1.673). We checked autocorrelation between independent variables by using the Durbin-Watson test, which is the most widely used to test for measuring autocorrelation (Hair et al., 1998). All values of this test were close to 2, and thus, all independent variables were accepted.

Table 4 summarizes the multiple regression results of our hypothesis tests. Models 1 through 6 present the results of multiple regression analyses for the effects of both service innovation and business strategies on firm performance. As presented in Model 1, industry type and firm age as control variables were estimated, indicating that none of the two control variables related to firm performance. Model 2 provides a test of the main effects of the three service innovation strategies on firm performance. The results for the main effects of service innovation strategies on firm performance show that only service creation-focused strategy was significantly related to firm performance ($\beta=0.122$, $p<0.05$).

	Mean	S.D	1	2	3	4	5	6	7	8
1. IType	3.23	1.52								
2. FAge	2.41	0.61	-0.01							
3. SCS	2.66	0.89	0.03	0.08						
4. SDS	3.17	0.65	-0.13	-0.04	0.40**					
5. CIS	3.37	0.62	0.23**	0.12	0.22**	0.09				
6. CLS	2.84	0.70	0.00	0.06	0.14	-0.01	0.09			
7. IDS	3.20	0.65	0.08	0.01	-0.08	-0.11	0.21**	-0.07		
8. FS	3.25	0.81	0.12	0.06	0.06	0.03	-0.02	0.16*	-0.11	
9. ITC	3.30	0.66	0.15*	0.13	0.15*	-0.05	0.12	0.14	0.01	0.17**

p < 0.10; **p < 0.05; ***p < 0.01

Table 3. Descriptive statistics and correlations

Note: IType: Industry type, FAge: Firm age, SCS: Service creation-focused strategy, SDS: Service delivery-focused strategy, CIS: Customer interaction-focused strategy, CLS: Cost leadership strategy, IDS: Innovative differentiation strategy, FS: Focus strategy, ITC: Information technology capability

Model 3 presents the main effects of the three business strategies on firm performance. With the exception of innovative differentiation strategy, cost leadership and focus strategies were significantly related to firm performance ($\beta=0.194$, $p<0.01$; $\beta=0.167$, $p<0.01$, respectively).

In Models 4 to 6, we added the interaction effects between business and service innovation strategies. Models 4 to 6 represent sequential tests of hypotheses H1, H2, and H3. All interactions were computed by multiplying variables after standardization. Model 4 provides a test of interaction effects between service creation-focused strategy and the three business strategies. The strategic alignment between service creation-focused and innovative differentiation strategies has a significant impact on firm performance ($\beta=0.088$, $p<0.10$), **thus supporting H1**. This result indicates that with innovative differentiation strategy, firms adopting a service creation-focused strategy can improve firm performance. Conversely, with less innovative differentiation strategy, the influence of service creation-focused strategy is weakened further, thus leading to a lower firm performance.

Model 5 represents the interaction effects between service delivery-focused strategy and the three business strategies on firm performance. In Model 5, the interaction between service delivery-focused and cost leadership strategies has a positive and significant impact on firm performance ($\beta=0.114$, $p<0.10$), which indicates that firms utilizing a service delivery-focused strategy are associated with firm performance with cost leadership strategy. Thus, a strategic alignment pattern exists between service delivery-focused and cost leadership strategies, **which supports H2**. Moreover, Model 6 predicts that customer interaction-focused strategy is more effective on firm performance with focus strategy.

	Firm Performance (FP)									
	Model1	Model2	Model3	Model4	Model5	Model6	Model7	Model8	Model9	Model10
Intercept	2.896***	2.118***	1.110**	1.172**	1.377***	1.149**	1.023**	1.020**	1.118**	1.320***
Control effect										
Industry type	.003	.001	-.008	.003	-.007	-.001	-.010	-.011	-.011	-.010
Firm Age	.114	.098	.074	.068	.070	.059	.070	.080	.036	.063
Main effect										
SCS		.122**	.092*	.103*	.093*	.102*	.087	.082	.091	.072
SDS		.098	.108	.100	.071*	.107	.112	.099	.076	.094
CIS		.056	.054	.059	.060	.055	.052	.060	.044	.075
CLS			.194***	.175**	.184***	.187***	.191***	.202**	.221***	.172***
IDS			.019	.005	-.012	.021	.018	.001	.022	.002
FS			.167***	.162***	.155***	.150***	.162***	.174***	.170***	.145**
ITC							.040	.037	.044	.013
Interaction effect										
SCS x CLS				.063						
SCS x IDS				.088*						
SCS x FS				.037						
SDS x CLS					.114*					
SDS x IDS					.031					
SDS x FS					.037					
CIS x CLS						.011				
CIS x IDS						.067*				
CIS x FS						.087*				
SCS x CLS x ITC								-.020		
SCS x IDS x ITC								.116**		
SCS x FS x ITC								-.006		
SDS x CLS x ITC									.121*	
SDS x IDS x ITC									.032	
SDS x FS x ITC									.061	
CIS x CLS x ITC										.037
CIS x IDS x ITC										.072
CIS x FS x ITC										.101*
R²	.013	.076	.182	.209	.206	.203	.184	.210	.210	.209
F	1.149	2.932**	4.848***	4.111***	4.027***	3.955***	4.333***	3.767***	3.772***	3.739***

*p < 0.10; **p < 0.05; ***p < 0.01

Table 4. Regression results for the interaction effects

The interaction between focus and customer interaction-focused strategies significantly influences firm performance ($\beta=0.087$, $p<0.10$), **so H3 is supported**. Although not as the best alignment for performance improvement, firms that adopt a customer interaction-focused strategy can also improve their firm performance with innovative differentiation strategy ($\beta=0.067$, $p<0.10$).

Models 8 to 10 in Table 4 provide the results for the moderating effects of IT capability on the strategic alignment between business and service innovation strategies for better firm performance. Model 8 presents the interaction effects of IT capability and the alignments between service creation-focused strategy and the three business strategies on firm performance. As presented in Model 8, the moderating effect of IT capability on the alignment between service creation-focused and innovative differentiation strategies is significantly positive ($\beta=0.116$, $p<0.05$), which indicates that IT capability is an important leverage for the efficient linkage between service creation-focused and innovative differentiation strategies than other strategies. Thus, **H4 is supported**. The result of Model 9 reveals that a significant effect of IT capability exists on firm performance with the alignment between service delivery-focused and cost leadership strategies ($\beta=0.121$, $p<0.10$). IT capability could help firms have the efficient linkage between cost leadership and service delivery-focused strategies, **providing support for H5**. Finally, Model 10 presents a moderating effect of IT capability on the three alignments between customer interaction-focused and the three business strategies. The result shows that only the interaction effect of IT capability on such an alignment between customer interaction-focused and focus strategies is positively significant ($\beta=0.101$, $p<0.10$). Thus, the benefit of strategic alignment exists between focus and customer interaction-focused strategies through IT capability as a strategic lever, which leads to a great achievement of firm performance. **Thus, H6 is supported**.

6. DISCUSSION AND IMPLICATIONS

6.1 Discussion of findings

Although an increasing number of service firms look to service innovation to create and sustain their competitive advantage, service firms often lack the theoretical and practical guidance for successful service innovation. In this study, we determined if firms with the strategic alignment between business and service innovation strategies would have better performance than firms without such alignment. We also investigated if business and service innovation strategies have close relationships with IT capability on firm performance. Based on the concept of strategic alignment as the theoretical framework, we identified three dominant strategic combinations between the three types of service innovation strategies and the three basic business strategies. The results of our study indicated three congruent patterns, which are innovative differentiation-service creation-focused, cost leadership-service delivery-focused, and focus-customer interaction-focused strategies. We then presented that IT capability indicated the moderating effect on relationship among the three dominant strategic combinations and firm performance.

6.2 Theoretical and Practical implications

Our study theoretically emphasizes two points. The first implication stems from the fact that the strategic alignment between business and service innovation strategies leads to competitive advantage and superior firm performance. This idea suggests that aligning service innovation strategy with business strategy should be viewed from the configurational perspective rather than the universalistic perspective, which means that specific strategic combination positively affects firm performance (Delery and Doty, 1996). This finding highlights how service innovation strategy supplements competitive positioning and corresponds with the external environment. Hence, this study suggests the great necessity of combining service innovation investment with business direction to improve firm performance. The second implication relates to the leveraging effect of IT capability, which facilitates the alignment between business and service innovation strategies. The result of this study indicated that the effective alignment between the two strategies with IT capability results in better

firm performance. Firms that have aligned service innovation strategy with business strategy should consider their IT capability improvement with an assurance that they will be leveraged substantially. For this reason, the selection and implementation of service innovation strategy is not in isolated mode. Both business strategy and IT capability are crucial factors in contributing to better service innovation success, which leads to better firm performance.

The results of this study also lead to several practical implications. The first contribution to practical managers is that we provided managers the congruent strategic patterns identified in this study, which can be compared to their current alignments between business and service innovation strategies. For example, firms with cost leadership strategy need standardized, mass-produced, and re-utilized information to facilitate the attainment of business objectives in pursuing operational efficiency. Therefore, firms that adopt cost leadership strategy are more effective to support the implementation of a service delivery-focused strategy. Companies pursuing differentiation strategy that focus on the unique and different value of services could produce new services by adopting the service creation-focused strategy. Therefore, service firms with misfit patterns should seriously consider changing their current alignment to achieve better firm performance. Another interesting implication is associated with the role of IT capability in service innovation. The real value of IT capability is in leveraging the alignment of a firm between business and service innovation strategies. Thus, firms should have a consensus of decisions of service innovation between the managers of both IT and business departments. IT managers should pay more attention to strategic-level issues and focus more on how IT functions can better align with business and service innovation strategies for better firm performance. For example, firms with innovative differentiation strategy could emphasize developing new services, which encourage the implementation of service creation-focused strategy by repeatedly inputting and re-utilizing knowledge through information systems.

6.3 Limitations and Future research directions

Despite the implications, several limitations associated with this study exist. First, several service firms that we surveyed may not be actually innovative, although they perceive themselves to be so. For this reason, this study has a gap between perception and representation that may result in the overestimation of the service innovation effects on firm performance. Future studies that can reduce this gap may provide stronger results. Second, compared to the well-developed measures of the three business strategies and IT capability, the measurement of service innovation strategy is not mature. Although we have defined the measurements of service innovation strategy based on the existing literature, we urge future researchers to develop more valid measures to assess firm strategic intentions in managing service innovation. Third, this study used a non-financial performance, which was measured as comprehensive meanings, to represent firm performance. However, non-financial performance has been measured in various forms such as operational efficiency, employee performance, market extension, and innovativeness (Ittner and Larcker, 1998; Low and Siesfeld, 1998). Therefore, future research should utilize various non-financial measures as firm performance in addition to financial performance. Finally, the typologies of both business strategy and service innovation strategy used in this study are simplified pure strategies. In practice, organizations may combine them in a more flexible way. Thus, future studies should consider various hybrid approaches in developing business and service innovation strategies.

7. CONCLUSION

This study sheds new light on service innovation research by identifying the strategic alignment between business and service innovation strategies, and by investigating the strategic role of IT capability for the effective linkage of service innovation with business strategy. Our findings suggest that the strategic alignment patterns between business and service innovation strategies appear to enhance firm performance. Implications for practice highlight that IT capability leads to the intensification of the interaction relationship between both strategies for better firm performance. As one of the earliest attempts to empirically validate the effect of alignment between business and

service innovation strategies on firm performance and the moderating effect of IT capability on the strategic alignments, this study provides organizations with a benchmark against which they could compare their current strategic alignment patterns and their use of IT capability.

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