Alignment Between Service Innovation Strategy and Business Strategy and Its Effect on Firm Performance: An Empirical Investigation

Hyun-Sun Ryu, Jae-Nam Lee, and Byounggu Choi

Abstract—A well-planned service innovation strategy is recognized as a prerequisite for successful service innovation in organizations. However, prior studies on service innovation strategies struggle to provide guidance on successful service innovation, because they do not consider the alignment between service innovation strategy and business strategy. Furthermore, they did not consider conditions, such as industries, that affect the alignments to improve firm performance. By using empirical data collected from 175 service firms in Korea, this study aims to investigate the effect of alignments between service innovation strategy (i.e., service creation-focused [SCFS], service delivery-focused [SDFS], and customer interaction-focused [CIFS] strategies) and business strategy (i.e., cost leadership [CLS], innovative differentiation [IDS], and focus [FS] strategies) on firm performance, which is assessed using both nonfinancial and financial measures. We then examine how the effect of alignments differs depending on industry types (i.e., scale intensive [SCIS], technology-based knowledge intensive [TKIS], and professional-based knowledge intensive service industries [PKIS]). Empirical evidence indicates that three alignment patterns (i.e., SCFS-IDS pattern, SDFS-CLS pattern, and CIFS-FS pattern) have synergistic effects on firm performance. Results also confirm that the effects of the alignments on firm performance differ according to the types of industry. The SCFS-IDS alignment performs well in the TKIS group, the SDFS-CLS alignment in the SCIS group, and the CIFS-FS alignment in the PKIS group. The implications for practice highlight the idea that successful service innovation requires judicious alignment between service innovation strategy and business strategy with the consideration of industries.

Index Terms—Business strategy (BS), firm performance, service innovation, service innovation strategy (SIS), strategic alignment.

I. INTRODUCTION

SERVICE industries dominate the global economy, generating around 80% of the Gross Domestic Product (GDP) and total employment in the US [56], [57]. The growth of services has motivated researchers to understand the critical factors in achieving successful service innovation. Accordingly, a vast body of research on service innovation has been produced. This body of research focuses on the characteristics and dimensions [13], [28], antecedents [9], and strate-

gies [22], [29] of service innovation. Service innovation strategy (SIS) has likewise attracted considerable attention from managers who aim to achieve successful service innovation to enhance their performance [22], [42]. SIS provides guidance as to which service innovation activities to select and how to conduct and manage them effectively. An appropriate SIS enables firms to effectively identify the characteristics of a new service offering and deliver service while meeting customer expectations and demands [46], thereby improving firm performance. SIS thus is a prerequisite for successful service innovation [42].

However, despite the apparent importance of SIS for successful service innovation and firm performance, our understanding of its roles and effects remains fragmented for two reasons. First, little attention has been paid to the synergistic effect of service innovation with business strategy (BS), although the alignment between the two strategies is essential to service innovation success [42], [55]. Second, although the value of the alignment between SIS and BS varies depending on environmental conditions [29], [45], questions on the conditions under which their alignments perform better have not been yet addressed. As a result, prior studies have failed to identify the conditions that affect the alignment between the two strategies to improve firm performance. To bridge these research gaps, this study is motivated by the following research questions.

1) What type of alignment between SIS and BS can effectively enhance the performance of service firms?

2) How does the effect of the alignment between SIS and BS on firm performance differ depending on the types of service industry?

This study empirically tests the alignment between SIS and BS and its effect on firm performance by drawing from Den Hertog [13]'s service innovation dimensional model (i.e., *service creation-focused strategy [SCFS], service delivery-focused strategy [SDFS], and customer interaction-focused strategy [CIFS]*) and Porter [61]'s typologies of BS (i.e., *cost leadership strategy [CLS], innovative differentiation strategy (IDS), and focus strategy [FS]*). Furthermore, this study investigates how the effect of SIS-BS alignment differs depending on the type of service industry, given that previous studies have indicated that good SIS and BS alignment for one industry may not be as good for others [17], [23]. For this purpose, this study classifies service industries into three major sectors, namely scale intensive (SCIS), technology-based knowledge intensive (TKIS), and professional-based knowledge intensive (PKIS) services, based on the typical classification in previous studies [33], [48]. This

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study attempts to answer the aforementioned research questions by using empirical data from 175 Korean service firms that have conducted service innovation activities in the last three years.

II. THEORETICAL BACKGROUND

A. Necessity of Aligning SIS With BS

Aligning SIS with BS is a key determinant of service innovation success. Firms often fail to implement successful service innovation activities because of the lack of alignment between SIS and BS [42]. SIS-BS alignment not only increases the involvement of business managers in service innovation activities, but also enables service innovation managers to be more knowledgeable about BS in conducting service innovation [46]. Thus, they are likely to work in harmony and improve their strategic actions, which in turn results in innovation success and better firm performance [55]. Furthermore, a SIS-BS alignment can promote effective service innovation investment from a long-term perspective [66]. Therefore, this study focuses on understanding the synergistic effect of aligning SIS with BS on the success of service innovation from the SIS perspective.

Another important factor that deserves further investigation in SIS is industry type, which is a commonly adopted proxy for environmental conditions in management literature [10]. An appropriate SIS-BS alignment that is valuable in a particular industry might not have the same value in a different industry. Therefore, the role of a firm's industry in service innovation should be carefully investigated because it poses an important contingency for effective SIS-BS alignments.

B. Service Innovation Strategies

Service innovation can be related to changes in the various characteristics of the service product itself [13]. Service innovation dimension refers to the area where service innovation occurs [20]. Therefore, this study defines service innovation as a change either in the service innovation dimensions (characteristics) or in the combinations of the service innovation dimensions. The change should be guided by a clearly defined strategy, which guides decisions on which area of innovation a firm should focus on [58] or how to enhance performance through service innovation activities [12]. In this sense, SIS is defined as *the strategic decision of firms on a change of service innovation dimension or combinations of service innovation dimensions to gain a sustainable competitive advantage.*

SIS should be understood within the service innovation dimension. One of the widely accepted frameworks of service innovation dimension was proposed by Den Hertog [13].[1] He

conceptualized four service innovation dimensions, namely, *service concept, service delivery, client interface,* and *technology.*[2] Service concept refers to the prototype of the service that offers a new value proposition in a particular market and covers both the descriptions of customer needs and services offered [21]. Service delivery indicates that the service innovation process comprises sequential activities and an internal organizational arrangement for delivering a new or existing service. Client interface is related to the design of the interface between the service provider and its clients. Finally, technology, although optional in practice, plays an important role as a facilitating or enabling factor in service innovations.

However, some dimensions should be revised to develop SIS effectively. First, technology is disregarded as an independent service innovation dimension. Many studies on service-dominant logic and resource-advantage theory have considered technology an operant resource rather than a service innovation dimension [69]. Second, this study redefines the dimension "client interface" as "customer interaction." Although these concepts are similar, the concept of customer interaction, which includes both customer coproduction and customer contact [51],[3] is broader and more suitable for developing SIS than the concept of client interface. Therefore, this study employs three major service innovation dimensions, namely, new service concept, new service delivery, and new customer interaction, to develop three SISs (i.e., SCFS, SDFS, and CIFS).[4] Table I summarizes the characteristics of these three SISs.

C. Business Strategies

Strategy is the mechanism that guides environmental alignment and provides integration for internal operations [64]. Organizations must develop and maintain an acceptable alignment with their environment to survive and flourish in a highly competitive market. Two dominant BS typologies have emerged in strategic management literature: Miles and Snow's typology (i.e., prospector, defender, analyzer, and reactor) [49] and Porter's typology (i.e., cost leadership, differentiation, and focus) [61]. Although both typologies have been extensively utilized, Porter's typology is more accepted in innovation research [18]. Moreover, Fitzsimmons and Fitzsimmons [26] suggested

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[1]The two dominant frameworks of service innovation dimension are Gallouj and Weinstein [28]'s framework and Den Hertog [13]'s 4-D model. The former highlights simple changes in the elements or characteristics of the final service offering, whereas the latter argues that service innovation indicates many changes within the various service innovation dimensions in an organization. Given our definition of SIS, Den Hertog's model is more suitable in developing SIS in this study.

[2]Den Hertog *et al.* [14] conceptually extended their original service innovation model by adding two dimensions (i.e., new business partner and new revenue model). The extended framework, however, is premature because the original framework has not been empirically validated. Thus, this study utilizes Den Hertog's origianl service innovation model.

[3]Customer coproduction indicates that customers actively engage in service innovation with effort, which leads to differentiation of service providers from competitors [24]. Customer contact refers to the degree of customer interaction in the service innovation process [51]. Den Hertog *et al.* [14] recognized the difference between the terms and reflected it in their extended service innovation framework.

[4]SIS is consciously made of not only a single decision (e.g., SCFS, SDFS, and CIFS), but also of multiple decisions (e.g., SCFS with SDFS, SCFS with CIFS, SDFS with CIFS, and SCFS with SDFS and CIFS). Although multiple decisions can occur in practice, SIS should be investigated initially as a single decision to obtain a basic understanding of the effect of SIS. No study has been empirically conducted on SIS as either a single decision or multiple decisions. For these reasons, three different SISs (i.e., SCFS, SDFS, and CIFS) are developed in this study along the aforementioned dimensions.

TABLE I
CHARACTERISTICS OF THREE SERVICE INNOVATION STRATEGIES

	SCFS	SDFS	CIFS
Type of innovation	Service concept (creation) innovation	Service delivery innovation	Customer-driven innovation
Innovation emphasis	Innovativeness and flexibility	Efficiency of service delivery	Effectiveness of communication between provider and customers
Market emphasis	New services; unique value	Low price; customer 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 price
Service-market volume	Average (middle)	Very broad (high)	Very narrow (low)

TABLE II
CHARACTERISTICS OF THREE BUSINESS STRATEGIES

	CLS	IDS	FS
Strategy emphasis	Cost reduction	Unique products and services	Specific customer needs
Product emphasis	Operational efficiency and effectiveness; economy of scale	Innovating and upgrading their products or services	Narrow target market
Type of product	Standardized existing products and services	New products and services	Limited or specialized line of existing products and services
Type of market	Existing (larger) market	New market	Existing and small (niche) market
Price policy	Low price	Premium price	Low price (or prestige price)
Segmentation of market	Unsegment of market	Different segments of product and services	Different segments of market
Investment	High capital investment in technology; efficient operation management	Product (service) R&D; high level of knowledge and skill	Customer segmentation; efficient collaboration management

that firms can understand the competitive environment of services by adopting three generic competitive strategies, namely, cost leadership, differentiation, and focus. Thus, this study employs the three BSs from Porter's strategy typology: CLS, IDS, and FS. CLS emphasizes cost reductions and attempts to maintain existing markets by producing standardized products and services at low cost. IDS continuously seeks new market opportunities through new products and services to respond quickly to changing market conditions. FS focuses on maintaining a particular target market by addressing the specific needs of customers. Table II summarizes the characteristics of these BSs.

D. Classification of Service Industry

Many service innovation studies have exerted considerable effort to build a sectoral-specific regime that can reduce the complexity of empirical phenomena into a few easy-to-remember categories [47]. These studies can be classified into three streams [19]: *technologist*, *service-oriented*, and *integrative approaches* (see details in Appendix A).

This study synthesized the three streams and studies on service industry classification and divided service sectors into SCIS, TKIS, and PKIS. Firms that generate 100% of their turnover to standardized services are classified as SCIS, including transport, distribution, and telecommunication services [33]. TKIS provides technology and production-related services, and transfers knowledge about technology to its clients, including engineering and architecture, research and development (R&D), and IT-related services [48]. Firms in the third group provide services based on specialized knowledge and expertise in specific professions [54], including marketing research, advertis-

ing, business and management consulting, and other traditional professional services [48].

III. THEORETICAL FRAMEWORK

A. Alignment Model Between SIS and BS

This study developed three related SISs (i.e., SCFS, SDFS, and CIFS) based on Den Hertog [13]'s model and viewed three BS types in terms of Porter [61]'s typology (i.e., CLS, IDS, and FS). Moreover, the three major groups of service sectors (i.e., SCIS, TKIS, and PKIS) were utilized to understand the different effects of SIS-BS alignment according to the type of service sector. Firm performance was analyzed in terms of nonfinancial and financial performance to determine the various aspects of synergistic effects among SIS, BS, and industry type [8]. SIS-BS alignment was assumed necessary to improve firm performance, and the types of service sector moderate the effects of SIS-BS alignment on firm performance. The overall research model is summarized in Fig. 1.

B. Alignment Between SCFS and IDS

SCFS involves frequently changing offers to customers and determining how such change can be achieved to create new value [13]. This strategy aims to provide customers a unique value from new services through service creation innovation. Thus, SCFS continuously seeks new opportunities (i.e., customer needs) from new innovative services (i.e., service offerings) [21].

Firms that adopt IDS develop a competitive advantage by innovating and upgrading their products or services, thereby gaining customer loyalty [61]. Given that IDS continuously seeks
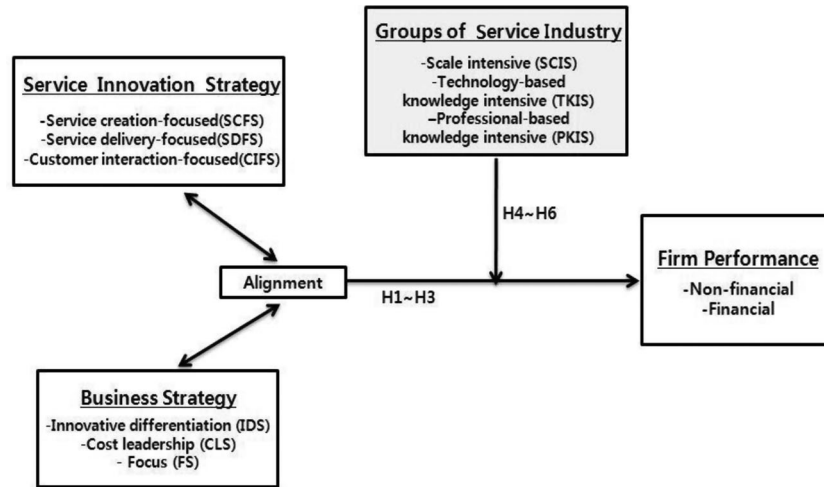
Fig. 1. Research model for the alignment between SIS and BS.

new market opportunities through new products and services to respond quickly to changing market conditions, it requires an organic or adhocracy structure that is ideal for performing unusual and complex tasks that tend to change continually [5], [50]. IDS places considerable effort and investment into developing new products and services and searching for new opportunities. Thus, this strategy tends to place strong emphasis on R&D and results in fairly high prices.

SCFS attempts to align an organization's strategy with competitive intentions to match customer needs and service offerings [16]. IDS is likely to develop and launch new services because differentiation positions are mostly achieved by introducing new services [15]. Organic structures in IDS have to be flexible and efficient to ensure the development of new services [5], [50]. Thus, IDS can clarify innovation activities and reduce conflicts by developing new services, thereby helping firms implement SCFS effectively. In contrast, SCFS is ineffective with CLS because SCFS is difficult to implement within a bureaucratic or mechanistic organizational structure [5]. SCFS-FS alignment is also less effective because FS targets specific and existing customers in a narrowly defined market without considering product differentiation and new market opportunities [39].

Accordingly, SCFS can effectively create a new service design and new service value with IDS. The competitiveness of firms can be improved with SCFS-IDS alignment, thereby increasing the firm's performance. Thus, we hypothesize the following.

H1: A SCFS in conjunction with an IDS produces better firm performance (i.e., nonfinancial and financial) than the SCFS in conjunction with either CLS or FS.

C. Alignment Between SDFS and CLS

SDFS alters where, when, and how a service product is delivered to the customer to offer differentiated services [9], [13]. Firms that adopt this strategy focus on establishing an efficient link between a service provider and its customers and thus cre-

ate the opportunity to reduce cost, time, and effort through a new valuable delivery process [27]. Accordingly, this strategy attempts to provide relatively stable and standard services to increase the efficiency of the delivery process and often offers greater convenience to customers [43]. SDFS normally employs technology, such as a new IT system that facilitates service delivery innovation [9].

CLS emphasizes cost reductions and attempts to locate and maintain existing markets by producing standardized products and services at low prices [15], [61]. Thus, CLS focuses on tight control and operating efficiency as means of reducing costs. CLS requires bureaucratic and mechanistic structures that emphasize operational efficiency [50]. SDFS can effectively internalize resource and knowledge as part of the innovation process together with CLS because CLS has a bureaucratic and mechanistic organizational structure as well as higher fixed-asset intensity than other BSs. If SDFS is aligned with IDS, organizations may not enjoy the alignment benefits because organic structures in IDS cannot effectively support delivery processes [5]. Thus, innovativeness and flexibility emphasized in IDS reduce operation efficiency and negatively influence the implementation of SDFS [50]. Moreover, SDFS is expected to be less effective with FS because FS attempts to serve specific customer needs by providing customized services that often result in an inefficient, high-cost delivery process [50], [61].

Accordingly, firms that adopt SDFS can easily improve the efficiency of their service delivery process and control the cost structure of services by using CLS because CLS is mostly achieved by refining existing services. Therefore, we hypothesize that:

H2: A SDFS in conjunction with a CLS produces better firm performance (i.e., nonfinancial and financial) than the SDFS in conjunction with either IDS or FS.

D. Alignment Between CIFS and FS

CIFS concentrates on changes in how deeply (i.e., customer coproduction) and to what degree (i.e., customer contact)

customers are involved in service innovation processes, such as service design, production, and consumption. This strategy attempts to provide customers with high-quality services that range from matching customer demands to services to customer interaction innovation. In particular, the strategy emphasizes customer interaction innovation because customers tend to be satisfied with services through interactions with service providers, and feedback from customers can shape other innovation activities [13].

FS attempts to maintain a particular target market by serving the specific needs of customers [61]. Firms that utilize this strategy direct their efforts at a narrowly defined strategic market and offer a specialized range of products or services. FS often develops a specialized understanding of the needs of the market and customer segment through innovation activities [26]. Based on a target market, this strategy aims to provide customers high-quality products without emphasizing product differentiation [39].

CIFS is expected to be more effective with FS because firms that adopt FS can meet and serve the specific needs of their customers through continuous customer interaction activities. However, CIFS appears ineffective with CLS because CIFS requires time, cost, and effort for frequent customer interactions. Thus, CIFS-CLS alignment suffers from operational efficiency and tight control because of CLS [61]. In addition, aligning CIFS with IDS is less synergic because firms with CIFS attempt to meet specific customer needs within a narrow target market without emphasizing product differentiation [13], [39].

Given that CIFS is likely to create a closer and more open relationship between customers and service providers, the strategy can help FS support its specific narrow target market more effectively and efficiently. Hence, CIFS improves firm performance when combined with FS. We therefore propose that:

H3: A CIFS in conjunction with a FS produces better firm performance (i.e., nonfinancial and financial) than the CIFS in conjunction with either IDS or CLS.

E. Alignment Between SIS and BS in Different Service Sectors

1) SCIS: Given the standardized existing services and high-capital technological investments in SCIS [60], [34], SDFS-CLS alignment can be more effective than others because firms that pursue this alignment strongly focus on improving their efficiency and productivity. Through the linkage between SDFS and CLS, firms can maintain and extend existing markets by producing standardized services at low cost and facilitating operational efficiency while delivering services to their clients, which improves service productivity. An effective and convenient delivery service with low cost enabled through the SDFS-CLS alignment is expected to increase customer satisfaction in SCIS [9]. Furthermore, given that both SDFS and CLS can produce and sell high volumes of service for existing markets because of their standardized service and cost advantage, firms that adopt this alignment can achieve higher economies of scale than their competitors, leading to an increase in the profit, cost savings, and sales growth of firms [1], [9]. Hence, SDFS-CLS alignment in SCIS might have a more significant influence on firm perfor-

mance in terms of nonfinancial and financial perspectives than that in other industry types. Thus, we hypothesize that:

H4: The effect of the alignment between SDFS and CLS on firm performance (i.e., nonfinancial and financial) will be greater in the SCIS industry than in other industries.

2) TKIS: SCFS-IDS alignment is more important in TKIS because TKIS firms strongly emphasize different positions in their market by introducing new technological knowledge. Moreover, with SCFS-IDS alignment, TKIS firms can effectively develop new technological services because they can minimize time to market and maximize the fit between customer needs and service characteristics based on effective service creation innovation activities [32], thereby leading to improved customer satisfaction [63]. Furthermore, services differentiated by seeking a new market opportunity through the SCFS-IDS alignment is expected to enhance marketing competitiveness [67], which results in an increase in the financial benefits of firms [61]. Thus, SCFS-IDS alignment might significantly affect both financial and nonfinancial performance in TKIS more than that in other industry types. Thus, the following hypothesis is proposed:

H5: The effect of the alignment between SCFS and IDS on firm performance (i.e., nonfinancial and financial) will be greater in the TKIS industry than in other industries.

3) PKIS: CIFS and FS aim to provide high quality services, such as marketing research, advertising, and business consulting services, through innovation-driven activities for small target markets. Given that PKIS firms focus on innovation based on the specified customer interaction and strongly depend on skilled employees [44], [54] in the narrow market, CIFS-FS alignment is expected to be more effective in PKIS. Improving customer satisfaction in the narrow market mainly depends on customer interaction because customers are likely to be satisfied with services when they interact with service providers [28]. Furthermore, customer feedback through CIFS-FS alignment allows new routines to be incorporated into existing ones. This condition increases customer satisfaction. Increased customer satisfaction results in enhanced financial outcomes, such as sales growth and return of investment [6]. Therefore, CIFS-FS alignment might significantly affect both nonfinancial and financial performance in PKIS more than that in other industry types, such as SCIS and TKIS. Thus, we hypothesize that:

H6: The effect of the alignment between CIFS and FS on firm performance (i.e., nonfinancial and financial) will be greater in the PKIS than that in other industries.

IV. RESEARCH METHODOLOGY

A. Measurement

To obtain content validity, the survey items were developed based on a thorough literature review. Unless otherwise indicated, all measures are based on a five-point Likert-type scale that ranges from "extremely low (1)" to "extremely high (5)." The structure of all measures used in this study is shown in Appendix B. A Korean version of the measures adopted from prior studies was created using translation-back-translation procedure [4].

TABLE III
SAMPLE CHARACTERISTICS

(a) Industry type			(b) Firm age		
Industry type	**Frequency**	**Percent**	**Year**	**Frequency**	**Percent**
Transport	30	17.1%	Less than 5	23	13.1%
Communication	36	20.6%	6–10	46	26.3%
Computer and software	32	18.3%	11–20	74	42.3%
Engineering and architecture	37	21.1%	21–30	26	14.9%
Business consulting	29	16.6%	30 and above	6	3.4%
Design services	11	6.3%			
Total	**175**	**100%**	**Total**	**175**	**100%**
(c) Number of employees			(d) Total sales ($: US dollar)		
Range	**Frequency**	**Percent**	**Range**	**Frequency**	**Percent**
10–29	54	30.9%	Less than $0.9 mil	24	13.7%
30–49	43	24.6%	$1–9.9 mil.	93	53.1%
50–99	39	22.3%	$10–49.9 mil.	41	23.4%
100–299	25	14.3%	$50–99.9 mil.	6	3.4%
300 and above	14	8.0%	$100 mil. above	11	6.3%
Total	**175**	**100%**	**Total**	**175**	**100%**

1) Independent Variables: Three different SISs were developed based on Den Hertog [13]'s three major service innovation dimensions: SCFS, SDFS, and CIFS. The three types of strategies proposed by Porter [61], namely, CLS, IDS, and FS, were employed to measure BS. Multiple-item measures of SIS and BS were drawn from previous studies on management and service innovation [9], [36]. Given that no empirically validated measure exists for the service innovation dimensions proposed by Den Hertog [13], we developed completely new item measures of SIS according to the three steps suggested by Moore and Benbasat [53].

2) Dependent Variables: The two aspects of firm performance, namely, *nonfinancial* and *financial,* were utilized as dependent variables. In the context of innovation, nonfinancial performance was measured as customer satisfaction based on responsiveness to customer needs, customer satisfaction, and service customization [38]. Financial performance was measured based on the three-year cumulative percentage growth in the sales of service firms that have engaged in service innovation activities from 2008 to 2010 [52].

3) Moderating Variables: Based on service innovation literature [33], [48], this study focused on three service sector groups, namely, SCIS, TKIS, and PKIS, to investigate the effects of industry type on SIS-BS alignment. SCIS was represented by "transport" and "communication" groups, TKIS was represented by "computer and software" and "engineering and architecture" groups, and PKIS was represented by "business consulting" and "design services" groups.

4) Control Variables: Firm age, which was measured by the number of years a firm has existed, was controlled because it affects the firm's external legitimacy of existence in its relationship with other firms, staying power, and intensity of actions [25]. In addition, *firm size*, which was measured by the number of employees, was also controlled because it may reflect the firm's current and past performance [62]. The natural logarithm of both firm age and firm size was utilized given the extent of the skew of measure.

B. Sample and Data Collection

Survey questionnaires were distributed to and collected from different Korean service firms for over four weeks in July 2011. The survey focused on SIS and BS that a firm has conducted over the previous three years. Therefore, the survey only targeted firms that conducted at least one service innovation activity between 2008 and 2010. The operation and service innovation managers of 856 participating firms were asked to fill out the questionnaires. To avoid biased measurements, the operation managers were asked to answer questions related to BS and firm performance, whereas the service innovation managers were asked to answer questions related to SIS.

The survey respondents were randomly selected from the entire population of service firms based on the 2010 Korean Innovation Survey (http://kis.stepi.re.kr). The samples were stratified across the aforementioned six broad subsectors. A total of 205 responses were received. Finally, 175 responses were found to be useful for this study, yielding a response rate of 20.5%. Table III summarizes the respondent characteristics.

To check nonresponse bias, the respondents were classified into two different groups: the first group ($n = 73$), which responded in the first and second weeks after the questionnaires were distributed, and the second group ($n = 102$), which responded in the third and fourth weeks. The two groups were compared in terms of their total sales and number of employees, as suggested by Babbie [2]. No differences were observed between the two groups in terms of total sales ($t = -0.24$, $p = 0.81$) and number of employees ($t = 0.69$, $p = 0.49$). These results suggest that the respondents are at least consistent and homogenous.[5]

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[5]This study could not directly test the difference between respondents and nonrespondents because some nonrespondents were not under the listed firms. Therefore, it was impossible to obtain information on nonresponse firms from the public.

TABLE IV
DESCRIPTIVE STATISTICS AND CORRELATIONS

Variables	Mean	S.D	1	2	3	4	5	6	7	8	9
1. FAge	2.45	0.62	1.00								
2. FSize	3.78	1.10	0.52**	1.00							
3. SCFS	2.71	0.87	0.09	0.04	1.00						
4. SDFS	3.17	0.68	−0.08	0.09	0.42**	1.00					
5. CIFS	3.44	0.75	0.12	0.02	0.16*	0.07	1.00				
6. CLS	2.86	0.75	0.06	0.09	0.21**	0.11	0.05	1.00			
7. IDS	3.12	0.63	−0.06	0.09	−0.07	−0.02	0.14	0.05	1.00		
8. FS	3.28	0.79	0.08	−0.01	−0.01	−0.03	0.08	0.09	−0.04	1.00	
9. NFP	3.17	0.60	0.11	0.14	0.21**	0.20**	0.16*	0.21**	0.04	0.19*	1.00

$^*p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$.

C. Measurement Reliability and Validity

The content validity of the survey instrument was established through the adoption of a standard instrument, as suggested in literature, and pretesting the instrument with the help of service experts. Factor analysis was conducted to reduce the number of uncorrelated factors. To determine whether the data are suitable for factor analysis, the measure of sampling adequacy (MSA) was calculated for each variable [31]. All variables had satisfactory MSA values that exceeded the threshold value of 0.5. Bartlett's test of sphericity was then implemented to determine the overall significance of all correlations within a matrix [31].

Cronbach's alpha, whose generally acceptable value is above 0.6, is used to test reliability of measurement. All Cronbach's alpha values in this study were acceptable. The extraction technique with varimax rotation was employed, and the latent root criterion, which requires that the eigenvalues be greater than 1, was applied to select the number of factors. Through factor analysis, seven uncorrelated factors[6] were identified (see Appendix B).

V. ANALYSIS AND RESULTS

A. Analytical Approach

Moderated multiple regression analysis was adopted to explore the synergy effects of each SIS-BS strategic interaction on firm performance. SPSS software version 12.0 was used to test the hypotheses. Table IV shows the descriptive statistics of and correlations between variables. Before computing the correlation of the variables, standardization was applied to reduce the multicollinearity of the interaction effects in the multiple regression analysis and to interpret the coefficients [37]. The variance inflation factors (VIFs) of the independent variables were calculated to test for multicollinearity. The VIF values of all variables were below the threshold value of 10. Autocorrelation among the independent variables were checked through Durbin–Watson test, and all variables returned Durbin–Watson values close to the threshold value of 2.

B. Testing the Hypotheses

Table V summarizes the multiple regression results of H1, H2, and H3. As presented in Model 1, firm age and firm size are

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[6]The reliability and validity of financial performance were not tested because such variables were regarded as factual data and could be measured through the cumulative percentage growth in the total sales of firms (from 2008 to 2010).

not related to nonfinancial and financial performance. The result means that none of the control variables affects the performance of service firms. Model 2 indicates that only CIFS enhances nonfinancial performance ($\beta = 0.100$, $p < 0.10$) and that none of the three SISs is significantly related to financial performance. The results of Model 3 show that only CLS can enhance both nonfinancial and financial performance ($\beta = 0.116$, $p < 0.10$; $\beta = 0.307$, $p < 0.05$). In addition, FS improves nonfinancial performance ($\beta = 0.129$, $p < 0.05$) and IDS does not improve financial performance ($\beta = -0.278$, $p < 0.10$).

Model 4 shows that SCFS-IDS alignment improves both nonfinancial ($\beta = 0.127$, $p < 0.05$) and financial performance ($\beta = 0.211$, $p < 0.10$) beyond what SCFS alone improves ($\beta = 0.079$ and $\beta = -0.164$, respectively). Model 4 also indicates that SCFS-CLS alignment does not improve nonfinancial and financial performance. Although SCFS-FS alignment improves only financial performance ($\beta = 0.173$, $p < 0.05$), its increase is smaller than that of SCFS-IDS alignment. These results indicate that firms can improve their nonfinancial and financial performance only when they align SCFS with IDS. Therefore, *H1 is supported*.

Model 5 shows that the SDFS-CLS interaction significantly improves nonfinancial performance ($\beta = 0.134$, $p < 0.05$) beyond what SDFS alone improves ($\beta = 0.130$). However, it does not enhance financial performance ($\beta = -0.334$, $p < 0.01$) beyond SDFS alone does ($\beta = -0.160$). Moreover, none of other combinations, such as SDFS-IDS and SDFS-FS alignments, improves nonfinancial performance. However, SDFS-IDS alignment improves financial performance ($\beta = 0.213$, $p < 0.05$), which implies that firms can enhance their financial performance by aligning SDFS with IDS rather than with CLS. Therefore, firms that align SDFS with CLS can improve their nonfinancial performance but cannot improve their financial performance more than firms that align SDFS with IDS. Therefore, *H2 is partially supported*.

Model 6 shows that the effect of alignment between CIFS and FS on nonfinancial performance ($\beta = 0.093$, $p < 0.10$) is greater than that of CIFS alone ($\beta = 0.088$). None of the other alignment combinations can improve nonfinancial performance. Moreover, CIFS-FS alignment enhances financial performance ($\beta = 0.285$, $p < 0.01$) beyond what CIFS alone improves ($\beta = -0.192$). The results also show that CIFS-IDS alignment enhances financial performance ($\beta = 0.270$, $p < 0.01$), but its increase is smaller than that of CIFS-FS

TABLE V
REGRESSION RESULTS FOR THE EFFECTS OF BOTH SIS AND BS ON FIRM PERFORMANCE

	Nonfinancial performance (NFP)						Financial performance (FP)					
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Intercept	2.819***	1.911***	1.199***	1.347***	1.288***	1.251***	0.107	1.301*	1.994**	1.860**	1.719*	1.976**
Control effects												
Firm age	0.052	0.044	0.033	0.046	−012	0.033	−0.079	−0.061	−0.089	−0.088	−0.009	−0.104
Firm size	0.060	0.052	0.049	0.034	0.076	0.044	0.061	0.069	0.075	0.017	−0.025	0.048
Main effects												
SCFS		0.088	0.071	0.079	0.054	0.087		−0.111	−0.182	−0.164	−0.134	−0.145
SDFS		0.118	0.119*	0.124*	0.130*	0.126*		−0.136	−0.156	−0.096	−0.160	−0.058
CIFS		0.100*	0.084	0.095	0.075	0.088		−0.155	−0.109	−0.074	−0.076	−0.192*
CLS			0.116*	0.074	0.122**	0.108*			0.307**	0.183	0.277**	0.374***
IDS			0.030	0.035	0.007	0.025			−0.278*	−0.118	−0.171	−0.274**
FS			0.129**	0.102*	0.130**	0.103*			−0.171	−0.194*	−0.164	−0.230**
Interaction effects												
SCFS×CLS				0.039						−0.333***		
SCFS×IDS				**0.127****						**0.211***		
SCFS×FS				−0.001						0.173**		
SDFS×CLS					**0.134****						−**0.334*****	
SDFS×IDS					−0.012						0.213**	
SDFS×FS					0.000						0.140	
CIFS×CLS						0.013						−0.533***
CIFS×IDS						0.031						0.270***
CIFS×FS						**0.093***						**0.285*****
R^2	0.021	0.092	0.147	0.173	0.182	0.162	0.002	0.031	0.088	0.175	0.149	0.298
F	1.871	3.439***	3.562***	3.104***	3.299***	2.867***	0.204	1.094	2.005**	3.147***	2.587***	6.287***
N	175	175	175	175	175	175	175	175	175	175	175	175

*$p < 0.10$; **$p < 0.05$; ***$p < 0.01$.

alignment. Hence, the effect of the alignment on firm performance is greater than that of other alignments when CIFS is aligned with FS. Therefore, *H3 is supported*.

Column (a) SDFS-CLS in Table VI presents the SDFS-CLS interaction effects on firm performance in the three service groups. SDFS-CLS strategic alignment significantly improves both nonfinancial ($\beta = 0.187$, $p < 0.10$) and financial performance ($\beta = 0.138$, $p < 0.05$) beyond what SDFS alone improves ($\beta = 0.185$ and $\beta = -0.082$, respectively) in the SCIS group.

Although SDFS-CLS alignment in the TKIS group enhances nonfinancial performance ($\beta = 0.136$, $p < 0.10$), its increase is smaller than that in the SCIS group. Furthermore, such effect in the TKIS group is significant but negative on financial performance ($\beta = -0.447$, $p < 0.10$). SDFS-CLS alignment in the PKIS group does not improve nonfinancial ($\beta = -0.033$, $p > 0.10$) and financial performance ($\beta = -0.007$, $p > 0.10$). Therefore, SDFS-CLS alignment in SCIS has a more significant influence on firm performance in terms of nonfinancial and financial perspectives than that in other service groups, which *supports H4*.

The SCFS-IDS interaction effect shown in column (b) SCFS-IDS in Table VI can improve both nonfinancial ($\beta = 0.262$, $p < 0.05$) and financial performance ($\beta = 0.840$, $p < 0.05$) beyond what SCFS alone improves ($\beta = 0.095$ and $\beta = -0.168$, respectively) in the TKIS group. Moreover, excluding the positive effects of SCFS-IDS alignment on financial performance in PKIS ($\beta = 0.261$, $p < 0.05$), none of the SCFS-BS alignment

in the SCIS and PKIS groups enhances both nonfinancial and financial performance. Therefore, TKIS firms that adopt SCFS with IDS exhibit higher firm performance improvement than those in the other service groups, which *supports H5*.

The CIFS-FS interaction effect in the PKIS group shown in column (c) CIFS-FS in Table VI significantly improves nonfinancial performance ($\beta = 0.317$, $p < 0.10$) beyond what CIFS alone enhances ($\beta = -0.205$). However, the CIFS-FS interaction effect on financial performance is positive but insignificant in the PKIS ($\beta = 0.214$). Although the CIFS-FS alignment effect in the SCIS group improves nonfinancial performance ($\beta = 0.146$, $p < 0.10$), its increase is smaller than that in the PKIS group. However, CIFS-FS alignment effect on financial performance ($\beta = 0.844$, $p < 0.01$) in the TKIS group is larger than that in the PKIS group. As a result, the effect of CIFS-FS alignment on only nonfinancial performance (not on financial performance) in the PKIS group is greater than that in the other industry types. Therefore, *H6 is partially supported*.

VI. DISCUSSIONS AND IMPLICATIONS

A. Discussions

The results show that SCFS-IDS alignment improves both nonfinancial and financial performance; thus, H1 is supported. SCFS-IDS alignment responds to ever-changing customer needs by searching for new market opportunities through new services. Hence, customer satisfaction is increased and financial benefit is achieved. Interestingly, other combinations of SIS and IDS,

TABLE VI
REGRESSION RESULTS FOR THE EFFECTS OF SIS-BS ALIGNMENT ON FIRM PERFORMANCE IN THREE SERVICE GROUPS

	(a) SDFS-CLS						(b) SCFS-IDS						(c) CIFS-FS					
	SCIS		TKIS		PKIS		SCIS		TKIS		PKIS		SCIS		TKIS		PKIS	
	NFP	FP	NFP	FP	NFP	FP	NFP	FP	NFP	FP	NFP	FP	NFP	FP	NFP	FP	NFP	FP
Intercept	1.222**	0.266	1.822**	5.628**	2.603**	0.402	1.257**	0.268	2.204**	6.720**	3.426***	0.832	1.096*	0.181	1.726*	7.035***	4.673***	1.455*
Control effects																		
Firm age	−0.043	−0.110	0.000	0.342	−0.346**	−0.202**	−0.012	−0.091	0.077	0.179	−0.277**	−0.202**	0.024	−0.062	0.060	−0.166	−0.251*	−0.167*
Firm size	0.265***	0.054	−0.145	−0.336	0.017	−0.029	0.239***	0.051	−0.164	−0.045	0.085	−0.044	0.207***	0.013	−0.184*	0.080	0.071	−0.046
Main effects																		
SCFS	0.044	−0.065	0.100	−0.236	−0.470***	0.052	0.101	−0.040	0.095	−0.168	−0.571***	−0.073	0.080	−0.035	0.111	−0.113	−0.650***	−0.026
SDFS	0.185	−0.082	0.116	−0.384	−0.026	0.012	0.147	−0.106	0.152	−0.401	0.035	0.069	0.198*	−0.109	0.200*	0.008	0.085	0.059
CIFS	0.074	0.183***	0.065	−0.724**	−0.006*	−0.013	0.046	0.166***	0.076	−0.693**	−0.053	0.004	0.038	0.194***	0.053	−0.810***	−0.205	−0.101
CLS	0.068	−0.045	0.123	0.483	0.151	−0.012	0.079	−0.031	0.070	−0.201	0.151	0.017	0.083	−0.041	0.178*	0.634***	0.027	−0.068
IDS	−0.275**	−0.043	0.187*	−0.181	0.177	0.054	−0.296**	−0.053	0.088	−0.109	0.140	0.023	−0.227	−0.004	0.109	−0.862**	0.179	0.041
FS	0.221**	−0.024	0.027	−0.347	0.517***	0.007	0.242**	−0.014	−0.032	−0.440	0.297**	−0.060	0.221**	−0.026	0.005	−0.772***	0.187	−0.127
Interaction effects																		
SCFS×CLS							0.099	0.045	0.114	−0.399	−0.295*	−0.051						
SCFS×IDS							−0.007	−0.083	0.262**	0.840**	0.012	0.261**						
SCFS×FS							0.014	−0.040	−0.039	0.074	−0.007	0.163						
SDFS×CLS	0.187*	0.138**	0.136*	−0.447*	−0.033	−0.007												
SDFS×IDS	−0.110	−0.060	0.213**	0.334	−0.181	−0.002										.		
SDFS×FS	0.003	−0.022	0.008	0.307	0.018	0.000												
CIFS×CLS													−0.073	−0.017	0.060	-0.632***	0.283***	0.110*
CIFS×IDS													0.004	0.029	0.013	0.693***	0.023	0.107
CIFS×FS													0.146*	0.046	0.125	0.844***	0.317*	0.214*
R^2	0.505	0.263	0.371	0.315	0.542	0.185	0.487	0.235	0.324	0.336	0.591	0.321	0.504	0.205	0.262	0.624	0.623	0.328
F	5.011***	1.750*	3.059***	2.386**	3.014***	0.577	4.662***	1.506	2.479**	2.617***	3.674***	1.205	4.992***	1.265	1.843*	8.601***	4.204***	1.244
N	66	66	69	69	40	40	66	66	69	69	40	40	66	66	69	69	40	40

$^*p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$.

such as SDFS-IDS and CIFS-IDS patterns, could also enhance firm performance in terms of financial measure, although their increases are smaller than that of SCFS-IDS alignment. The results indicate that the differentiated position of service firms is achieved by innovating the cost structure and service delivery processes (e.g., low-cost airlines [3]) and by developing the close relationship with customers through frequent interactions (e.g., My Starbucks idea [24]).

This study proposed that SDFS-CLS alignment could positively affect nonfinancial and financial performance. However, the negative effect of SDFS with CLS on financial performance contradicts this hypothesis (i.e., H2 is partially supported). Interestingly, the negative effect on financial performance is positive in SCIS. A possible explanation for this intriguing result is that firms with SDFS-CLS alignment are unlikely to search for new opportunities outside their domains because they prefer to adjust their organizational structure and technology to improve their operational efficiency within their domains [61].

The results show that CIFS-FS alignment achieve better both nonfinancial and financial performance; thus, H3 is supported. The close relationship between customers and service providers created by the CIFS-FS alignment leads to improved understanding of customer needs and customer satisfaction, which in turn increases financial outcomes. The results emphasize the importance of customer interactions through service innovation initiatives.

The roles of different industry types in service innovation were also examined in this study. As shown in Fig. 2, the effect of each alignment varies depending on the type of service sector (i.e., SCIS, TKIS, and PKIS). The results confirm that SCIS firms that align SDFS with CLS exhibit better nonfinancial and financial performance than those in other service groups, such as TKIS and PKIS, which support H4. With standardized services, which is one of the main characteristics of SCIS, firms focused on SDFS-CLS alignment can improve their efficiency and productivity, resulting in increased firm performance.

SCFS-IDS alignment improves performance of TKIS firms (i.e., H5 is supported). Given that most TKIS firms focus on technology differentiation, aligning SCFS with IDS allows TKIS firms to develop new and unique technologies to distinguish themselves from their competitors. The relationship between SCFS-IDS alignment and firm performance implies that the search for new opportunities through the development of new services and markets immediately enhances the nonfinancial and financial performance of TKIS firms.

Although the results show that CIFS-FS alignment improves the nonfinancial and financial performance of firms in PKIS, the increase in the financial performance of firms in PKIS is smaller than that of firms in TKIS. This finding is contrary to our expectation (i.e., H6 is partially supported).[7] A possible explanation for this result is that financial performance appears to have increased less because PKIS firms which meet specific cus-

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[7]In addition, CIFS-CLS alignment can also help PKIS firms improve their performance even though the increase is smaller than that in CIFS-FS alignment in PKIS firms.
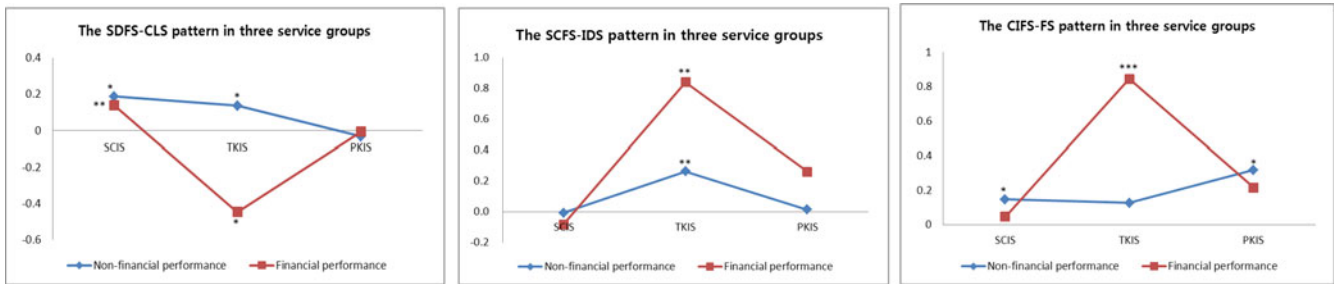
Fig. 2.   Interaction effects of three alignments in three service groups. Note: $^*p < 0.10$; $^{**}p < 0.05$; $^{***}p < 0.01$.

tomer needs with a narrow target market exhibit minimal sales growth. Therefore, CIFS-FS alignment is more effective to improve nonfinancial performance, such as customer satisfaction, and not financial performance in the PKIS group.

Consequently, these results indicated that such an alignment may be good for one industry but not for others, which is consistent with the earlier research [17], [23]. The heterogeneity of service industries causes these results because the different structures and characteristics of the service industries are large enough to be significant. Therefore, sector-specific factors are major contributors to the successful development of service innovations and thus service industries should not all be treated as if they were same.

B. Theoretical and Practical Implications

This study presents several theoretical implications or contributions for service innovation research. First, this study contributes to expand the current understanding of service innovation research by demonstrating SIS theoretically and empirically. The majority of innovation research to date, though insightful, has treated services merely as a separate function of product, thereby employing residual conceptualizations of service innovation [30], [59]. Furthermore, the effects of service innovation phenomena have generally been assessed through perceptual rather than actual measures of firm performance, which leading to little empirical studies in service innovation literature. To fill the gaps, this study developed three major SIS (i.e., SCFS, SDFS, and CIFS) based on the service innovation dimension model [13] from a holistic and integrative perspective [19], [59], and empirically validated the SIS constructs. Second, this study closely links SIS-BS strategic alignment with superior firm performance, which suggests that such alignment should be viewed from the SIS perspective and the contingency perspective. Therefore, several specific strategic combinations between SIS and BS can positively affect overall firm performance. This finding highlights how such business direction of a firm complements and corresponds with SIS. Hence, this study suggests that service innovation investment must be combined with business direction to improve overall firm performance. Third, this study showed that SIS-BS strategic alignment produces different effects on each service sector group. Firms should consider their external environment before aligning SIS with BS to realize

the expected synergistic effects on firm performance. Sector-specific factors are major contributors to the successful development of service innovations, which in turn lead to better firm performance.

This study also presents several practical implications. First, this study suggests that managers should coordinate their decisions on both the service innovation and business directions of their firms. Firms that align SIS with BS effectively conduct their service innovations and thus achieve competitive advantage and superior financial performance. SIS cannot be selected and implemented by itself. Business and service innovation managers should focus not only on service innovation issues at the strategic level but also on how they align their service innovation practices with their business strategies to achieve better firm performance. Second, managers should compare the congruent strategic combinations that have been identified in this study with the SIS-BS alignments they currently practice. For example, when firms adopt SDFS to conduct service innovation, they should also adopt CLS and interact with SDFS to allow for the implementation of SDFS because CLS requires standardized, mass-produced, reutilized information to facilitate the pursuit of operational efficiency. Therefore, service firms with misaligned patterns should seriously consider changing their current alignments to improve their performance. Third, managers should consider their external environment conditions to effectively align SIS and BS. The three service sector groups, with each group demonstrating an individual characteristic, produce different effects on SIS-BS strategic alignment, and result in better firm performance in terms of nonfinancial and financial measures. For example, although SDFS-CLS alignment negatively affects the financial performance of the entire sector, it positively affects the financial performance of SCIS firms but negatively affects that of TKIS firms because of sector-specific factors. To avoid misaligned patterns, managers should consider their type of service sector when developing and implementing SIS-BS alignment, which would subsequently help them achieve superior firm performance. Fourth, managers in manufacturing firms recognize the importance of service innovation, in addition to product innovation, to gain a sustainable competitive advantage [29]. Manufacturing firms try to extend their businesses by providing additional services for their customers because product value can be fully realized by delivering related services together. That is, even for firms in the manufacturing industry,

TABLE A1
SUMMARY OF SECTORAL PATTERNS IN SERVICES INNOVATION LITERATURE

Key studies	Classification	Examples of service sector
Technologist approach		
Pavitt [60]	1) Supplier dominant 2) Scale intensive 3) Specialized suppliers 4) Science-based information intensive	–Private services and traditional manufacture –Bulk materials and assembly (e.g., automobiles) –Machinery and instruments –Electrical, chemical, financial
Evangelista [23]	1) Technology users 2) Interactive services 3) Science and technology-based services 4) Technology consultancy services	–Transportation, legal, travel, and retail –Advertising, banking, insurance, and hotel, –R&D, engineering, and computer and software –Combination of interactive services, and science and technology-based services
Hipp and Grupp [33]	1) Supplier dominance 2) Scale intensity 3) Network basis 4) Knowledge intensity	–Other financial services –Transport, distribution, and telecommunication –Banking, and insurance –Technical services, R&D, and software
Service-oriented approach		
Miles *et al.* [48]	1) Technology-based knowledge intensive services 2) Professional knowledge intensive services	–Telecommunication, IT services, software, IT consulting, and R&D services –Marketing/advertising, training, designing, business consulting, legal, and accounting
Koschatzky [40]	1) Advisory services 2) Technical services	–Legal services, business consulting services –Computer-related services, engineering services
Vence and Trigo [70]	1) Low innovation-intensive 2) Technology-intensive and moderately innovation-intensive 3) Knowledge and innovation-intensive	–Wholesale, transport, and communication –IT services, computers, and software –Business services
Integrative approach		
Castellacci [7]	1) Personal goods and services 2) Mass production of goods 3) Infrastructural services 4) Advanced knowledge providers	–Textiles and clothing, hotels, and restaurants –Electronics and motor vehicles –Telecommunication, finance, wholesale trade –Software, R&D, engineering, consultancy
Trigo and Vence [68]	1) Intensive techno-scientific flows of information 2) Intensive interactions with clients 3) Lone innovators	–R&D, telecommunication, architectural, and engineering –Finance, transport, and travel –Wholesale trade, real estate, software consultancy, computer related services

service innovation is considered as one of the important factors to differentiate their product value from that of their competitors [30], [29]. Therefore, the results of this study, which provide a deeper understanding of the strategic and effective alignment between SIS and BS and its effect on firm performance in consideration of a firm's industry type, can also help mangers in manufacturing firms develop the appropriate alignment to ensure the long-term survival of a firm.

C. Limitations and Future Research Directions

Despite the aforementioned contributions of this study, it also has several limitations. First, many service firms perceive themselves as innovative even when they are not. This condition produces a gap between perception and representation in this study. Hence, the effects of service innovation on firm performance are overestimated. Future studies can enhance the strength of this study's results by addressing such gap. Second, the measures of the three SISs developed in this study are not as mature as those of the three BSs. Although these measures were developed based on theoretical literature and were validated through the proposed methods of Moore and Benbasat [53], future studies need to develop highly valid measures to assess the effects of SIS in managing service innovation. Third, the typologies of both SIS (i.e., SCFS, SDFS, and CIFS) and BS (i.e., CLS, IDS, and FS) utilized in this study are simplified pure strategies.

We did not use any hybrid approaches to avoid complicating our analyses. However, given that several organizations may still combine these typologies, future studies may adopt hybrid approaches.

Fourth, some of our hypotheses are supported with a p-value of 0.10, which is lower than the generally accepted significant levels of 0.05 and 0.01. However, a p-value of 0.10 may be acceptable in service innovation studies because the short-term effects of innovation cannot be precisely determined. For example, Hull [35] used a p-value of 0.10 to investigate how the magnitude of innovation strategy moderates the effects of a model of service product development. Other researchers, such as Avlonitis *et al.* [1] and Storey and Hull [65], also tested their hypotheses with a p-value of 0.10. Future studies should adopt a higher significance level to strengthen the validity of their findings. Fifth, this study only focused on six service sectors, namely, transport, communication, computer and software, engineering and architecture, business consulting, and design services. Thus, our findings may be inapplicable to other service sectors. Future research should adopt a broader research scope to explore additional alignment patterns. Finally, our findings are not completely generalizable because our sample is restricted to Korean firms. Although service firms in Korea share many similar characteristics with American and European service firms, the socio-economic environment and the service innovation practice in Korea may limit the applicability of this study

TABLE B1
THE STRUCTURE OF SURVEY INSTRUMENT

Factors and items ($N = 175$)	Factor loading	Cronbach alpha
Service creation-focused strategy (SCFS)		
To what extent has the service concept or design of your service product been changed compared to your competitor during the last three years?		0.747
SCFS1. Offering new services (including new bundles and packages of services) in new markets	0.890	
SCFS2. Offering new services (including new bundles and packages of services) in existing markets	0.879	
SCFS3. Offering significantly improved services in existing markets	0.659	
Service delivery-focused strategy (SDFS)		
To what extent has the service delivery system of your service product been changed compared to your competitor during the last three years?		0.742
SDFS1. Offering new service delivery methods for customers to order new services	0.867	
SDFS2. Offering new service channels to adjust customers convenience	0.817	
SDFS3. Offering additional service delivery approach to improve service quality	0.750	
Customer interaction-focused strategy(CIFS)		
To what extent has the customer interaction between your firm and customers been changed compared to your competitor during the last three years?		0.746
CIFS1. Offering customers opportunities to participate in service production and delivery	0.846	
CIFS2. Offering new interfaces which customers are able to participate in.	0.823	
CIFS3. Offering customer contacts while developing new service concepts or service deliveries	0.777	
Cost leadership strategy (CLS)		
To what extent has your firm focused on the following activities compared to your competitor during the last three years?		0.821
CLS1. The degree of price leadership	0.773	
CLS2. The degree of service design cost advantage	0.892	
CLS3. The degree of service delivery cost advantage	0.802	
CLS4. The degree of operation cost advantage	0.757	
Innovative differentiation strategy (IDS)		
To what extent has your firm focused on the following activities compared to your competitor during the last three years?		0.791
IDS1. The degree of uniqueness of service design	0.826	
IDS2. The degree of uniqueness of service delivery process	0.824	
IDS3. The degree of unique technologies for service differentiation	0.729	
IDS4. The degree of innovativeness of service	0.766	
Focus strategy (FS)		
To what extent has your firm focused on the following activities compared to your competitor during the last three years?		0.823
FS1. The degree of differentiation of service offering for the target market	0.850	
FS2. The degree of differentiation of service design for the target market	0.858	
FS3. The degree of differentiation of service delivery process for the target market	0.873	
Nonfinancial performance (NFP)		
To what extent has your service product been changed compared to your competitor during the last three years?		0.682
NFP1. Responsiveness to customer needs increase	0.637	
NFP2. Customer satisfaction improvement	0.829	
NFP3. Customized service offering improvement	0.784	
Financial performance (FP)		
To what extent has your service product been changed during the last three years?		
FP1. The three years cumulative percentage growth in sales		

to other service contexts in other countries. Therefore, the SIS-BS alignments adopted by service firms in other countries must be analyzed in the future to improve the generalizability of the results.

VII. CONCLUSION

This study sheds new light on service innovation by identifying effective SIS-BS linkages. The findings suggest that three strategic alignment combinations between SIS and BS can increase the innovation benefits and enhance the performance of a service firm. Industry-specific conditions can also influence the effects of SIS-BS alignment on firm performance. Therefore, managers should consider their contexts and determine which service sector group they belong to before they align SIS with BS. Considering that this study is one of the earliest attempts to investigate the alignment between SIS and BS and its effects on firm performance, the strategic alignment combinations identified in this study provide firms with a benchmark with which to compare their current strategic alignment combinations in their own external environment. Firms that adopt misaligned patterns

should seriously consider changing their current alignments to improve their performance.

APPENDIX A
CLASSIFICATION OF SERVICE INDUSTRY

The first stream, *technologist approach*, considers service innovation as the introduction of new technologies and classifies service firms according to their technological changes. The second stream, *service-oriented approach*, constructs taxonomies of nontechnological, service-specific trajectories because the technologist approach is too narrow to reveal the dynamic innovation patterns in the service sector [41]. The third stream, *integrative approach*, focuses on the innovation that encompasses both service and manufacturing sectors [11] as the boundaries of innovation between these two sectors become increasingly blurred [19]. Table A1 summarizes each of these streams.

APPENDIX B

See Table B1.

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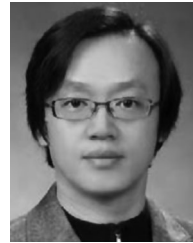
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