

The Relationship between Servitization Improvements and Business Performance of Manufacturing Companies: A Strategic Fit Perspective

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Abstract

Though servitization is hot in theory and practice, empirical research on the relationship between servitization and business performance is limited. Furthermore, existing empirical studies yield mixed results which constrains the development of servitization. Different from most servitization researches focusing on the service business, this empirical research, based on an international large-scale survey database-International Manufacturing Strategy Survey (IMSS), investigates the servitization improvements from the strategic fit perspective. “Service extension, service skill improvement and product design modification”, three improvement actions directly related to service business, are investigated. The results show that the strategic fit of “service extension” and “service skill improvement” significantly influence the business performance. The findings highlight the importance of the strategic fit of servitization improvements, reveal the conditions when servitization will enhance the business performance, and offer guidelines on the implementation of servitization.

Keywords: *Manufacturing companies, Servitization, Strategic fit, Business performance, Empirical research, IMSS*

1. Introduction

Companies in developed countries rarely survive exclusively as pure manufacturing enterprises [1]. Even in China, many manufacturing firms offer services and solutions to customers besides products. Adding services to the core products will offer better performance of the product itself and create more customer value [2]. Servitization has become a popular strategy [3]. However, existing empirical studies yield mixed results [4-7]. Our understanding of the performance impact of servitization in manufacturing company is still limited [3-8]. More in depth analyses on the business performance impact of servitization from different perspectives are still required.

Recent studies have focused on the challenges for manufacturers in servitization [9] and related capabilities which influence the effects of servitization [10-11]. To obtain necessary capabilities and overcome challenges, manufacturing firms should implement servitization improvement actions to transform the process, operation and organization structure in an overall way [1] and [12-14]. Different from those empirical researches

focusing on the service business [5] and 15-16], this research highlights the contribution of servitization improvements to business performance.

The development of service-specific capabilities demands substantial investments [17-18]. While the top investment motive for manufacturing organizations is different from service organizations [19]. The investment decisions should be determined by the strategy. Does the lack of strategic emphasis on the service restrain the servitization improvements? On the other hand, will the disjointedness between strategy and implementation leads to the “service paradox”?

Slack [20] highlighted that the “strategic fit” is a useful perspective in understanding the progress of servitization transition. So this research aims to reveal the influence of manufacturing servitization on the business performance from the perspective of strategic fit, to find out the reasons why some manufacturing companies fail in servitization, and to offer some advice on the implementation of servitization.

2. Servitization and Improvements

Many scholars have discussed this evolution of manufacturing companies from different disciplines such as marketing, operations management and strategy management. Besides servitization, there are a number of other closely related research communities, such as product-service systems, service enhancement, service factory, integrated solutions, industrial service and service infusion. In this paper, the term “servitization” is adopted to represent this innovative transformation.

Vandermerwe and Rada [21] coined the term “servitization” and defined it as “the increased offering of fuller market packages or ‘bundles’ of customer focused combinations of goods, services, support, self-service and knowledge in order to add value to core product offerings”. Besides this, there are other definitions in the wider literature. Throughout these definitions “service” is central, and generally they are all broadly in agreement with the definition provided by Vandermerwe and Rada [9]. Besides the central “service”, some scholars highlighted that servitization is a transformation or innovation; some scholars proposed that the servitization is a process with the cultivation and improvement of new capabilities and processes with the extension of service business [6-9].

Service is different from manufacturing in many ways, such as operations [22], management policy [23], organization structure and process [24]. There are many challenges and obstacles hindering the process of servitization [9-13]. To overcome these obstacles and achieve better performance and competitiveness through service business, manufacturing companies are required to implement different kinds of improvement actions. Therefore, we define the servitization as the innovation of an organization’s structure, processes, culture and capabilities to shift from selling products to selling integrated products and services that deliver value in use. Our definition highlights that service business and servitization improvements are two important components of servitization.

Servitization improvements cover all the change/modification/innovation of organization structure, processes, culture and capabilities which aim to support the service business of manufacturing companies. The servitization improvements are the base of servitization and will make manufacturing companies more adaptable and eligible as service providers and offer necessary capabilities to the extension of service business. Kao, Yang, Yen and Hung [25] proposed a 5 level servitization transformation progress for manufacturing industries and highlighted that improvement actions (a set of methodologies, strategies, and technologies) will aid the manufacturing company upgrade the servitization transformation level. This research focuses on the servitization improvements.

3. Strategic Fit of Servitization

Davidsson, Edvardsson, Gustafsson and Witell [26] claimed that in order to succeed with service offering, manufacturing companies should be sufficiently service oriented. Lay and Erceg [27] proved that competing with service can offer higher profit for manufacturing companies than with other strategic choices, such as innovation, technology and quality.

However, not every manufacturing firm views service as the strategic core of their business [28]. In particular, the literature pointed to a cultural and cognitive bias against services and service-specific values such as heterogeneity and flexibility, since these values contradict traditional manufacturing goals and practices such as standardization and efficiency [29]. Gremyr, Löfberg and Witell [30] identified the imbalance between a business strategy that focuses on service and the implementation of service development as a secondary business. Wood [31] identified the imbalance between the focus on products in the development process and services in the delivery process, which might hamper an organization's growth in terms of service. Successful service strategies are difficult to be implemented in manufacturing firms due to path dependencies that high status and excellence in product-related areas create [32].

These phenomena contradict the idea of fit. Fit has been the core concept of strategy management research [33] and the positive relationship between fit and business performance has been proved by scholars [34-35]. There are many researches on strategic fit. Among them, Kim and Frohlich [36] suggested that actions rather than decisions should be included in the operations strategy framework. Focusing on manufacturing practices, the operations strategy framework will assist companies in improving their environmental and internal fit, which should then lead to a better performance [37]. So this research focuses on the servitization improvement actions. Based on one prevailing operations strategy framework proposed by Frohlich and Dixon [38], the strategic fit model of servitization is formulated (Figure 1). The service orientation of competitive strategy shows the strategic emphasis on the service among all competitive capabilities (such as cost, quality, innovation, delivery *et al.*). This research is based on this model.

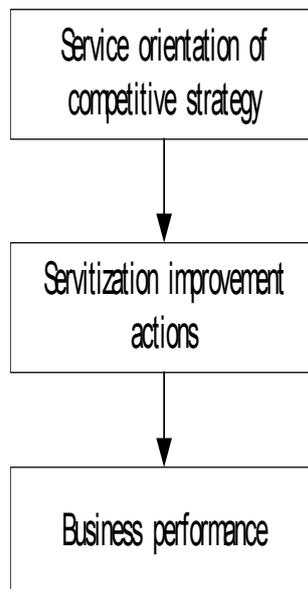


Figure 1. Strategic Fit Model of Servitization

4. Hypotheses Development

In this research, we mainly focus on three improvement actions directly related to the service business: expanding the service category, developing service-related skills and integrating the products and services.

4.1. Expanding the Service Category

Service has always been the core of the servitization [9], and the extension of service business has been the key indicator of servitization process [39-40]. However the process of new service development is generally complex and can be problematic to define and articulate [41]. Service innovation is strange to most manufacturing companies, since the co-production aspect of services requires a more customer-centric approach [42], closer customer relationships and better knowledge of customers' operations [43]. So, investing in developing new services and expanding service category is an important improvement action. Successful new service development will expand the services portfolio, promote the servitization, and offer better return.

While most manufacturing companies have a core product that has traditionally carried most of the value and is heavily embedded in the company culture. As a consequence, manufacturing companies may need to manage the symbiotic relationships between two different business logics: a service oriented and an industrial, product oriented one [24]. The tension between a service and a product/manufacturing culture is likely to be a constant challenge particularly for companies undertaking servitization [22]. Manufacturing companies must be sufficiently service oriented in order to succeed with service offering [39]. Expanding the service business requires the definition of a service strategy [44]. The first hypothesis is formulated as follow.

H1: When one manufacturing company formulates highly service oriented competitive strategy, "expanding the service category" will create better business performance; otherwise, if the service orientation of competitive strategy is weak, "expanding the service category" will erode the business performance.

4.2. Developing Service-Related Skills

The management principles of service companies are always different from the practices of traditional manufacturing companies [23]. Many manufacturing companies don't know how to offer after services which create many difficulties in servitization [45]. The lack of necessary competences is one of the most important obstacles of servitization [14]. Tian *et al.* [46] and Kohtamäki, Partanen and Möller [16] empirically verified that the service-related capabilities significantly moderate the relationship between services and business performance. Manufacturers should cultivate necessary related skills or competence [14]. However, the improvement of service skills is often a painful process, as manufacturers are torn between preserving their traditional strengths and developing new ones [47]. This improvement requires investment and should be supported by the strategy. The second hypothesis is formulated.

H2: When one manufacturing company formulates highly service oriented competitive strategy, "developing service-related skills" will create better business performance; otherwise, if the service orientation of competitive strategy is weak, the "developing service-related skills" will erode the business performance.

4.3. Integrating Services with Products

The relationship between the service and product is very important to the servitization. Lele [48] suggested that service needs influence product strategies and appropriate service strategies are structured to meet the requirement of each product category. Kindström and Kowalkowski [22] proposed that products and services should be developed together to

ensure optimal functioning as an offering. Manufacturing companies should integrate business responsibilities for the product and service businesses [49], and make the products and services business cooperate and promote each other, which may offer distinguished competitive advantages to manufacturing companies. So, integrating the services with products is another important improvement action influencing the synergy between production and service.

But there is a short-term and long-term contradiction existing in the production decision [22]. The use of cheaper components in manufacturing will reduce the costs and prices of products, though this may influence the products quality. This will lead to more frequent repair and maintenance. In a short-term perspective, this can have a positive effect on service sales. In the longer term, however, this will lead to deteriorated customer relationships and also obstruct the firm from having high margins on more extensive offerings with higher service content. Johansson and Olhager [50] highlighted that on a strategic level, companies have to decide whether new products and services processes should be linked through bundling or not. An effective integration of the product and service development processes creates a potential for product-service innovation, that being exploited, contribute to increase competitiveness and to ensure sustainable businesses [51]. So, the third hypothesis is formulated.

H3: When one manufacturing company formulates highly service oriented competitive strategy, “integrating services with products” will create better business performance; otherwise, if the service orientation of competitive strategy is weak, “integrating services with products” will erode the business performance.

Based on the strategic fit model of servitization proposed above and hypotheses, the conceptual model is formulated and depicted as Figure 2.

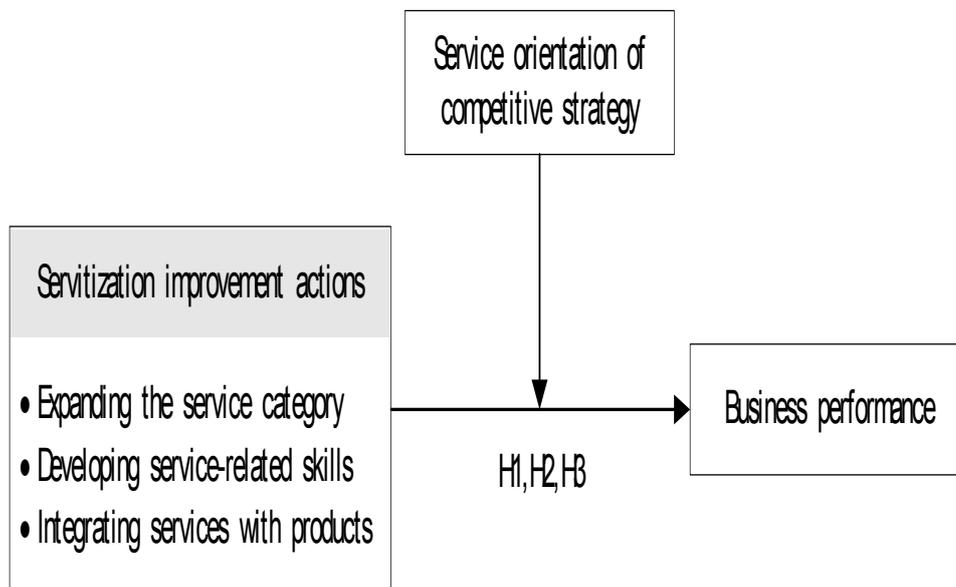


Figure 2. Conceptual Model

5. Research Methodology

5.1. Data and Sample

It is evident that the servitization research is still dominated by theoretical work, and thus additional empirical research is required [52]. Besides case studies, only a few quantitative studies address this topic [5-6]. Furthermore, the importance and contribution of the broad-based large-scale survey research to the development of Operations

Management empiricism has been highlighted by Roth [53]. So this empirical research is implemented based on an international large-scale survey database-International Manufacturing Strategy Survey (IMSS).

The IMSS project was originally launched in 1992 by the London Business School and Chalmers University of Technology to gather data related to manufacturing strategy in a global setting. IMSS tries to discover the manufacturing strategies on a global scale and at a national level, and to establish a common database on manufacturing strategies, practices, and results. The IMSS covers firms classified by the ISIC (rev. 2) Division 38-Manufacture of Fabricated Metal Products, Machinery and Equipment (this is equivalent to the current ISIC (rev. 3.1) sectors 28-35). To date five surveys have been administered. The fifth round of IMSS (IMSS-V) in 2009 provides the data for this paper. Comparing to last four rounds, investigation on the “shifting manufacturing towards services” topic is an important change of IMSS-V which keeps pace with the development of manufacturing practices and theory.

Sampling of IMSS-V is biased towards best practice and best performing firms and the unit of analysis is the plant/business unit. The survey is completed by the director/head of operations/manufacturing. In nations where English is not a prevalent language, the surveys are translated by full-time operations management professors familiar with operations management and manufacturing strategy. The IMSS has been one of the most important databases around the world. Many empirical studies, focusing on manufacturing strategy and related topics, were developed based on IMSS, such as Voss and Blackmon [54], Caniato *et al.* [55] and Cagliano *et al.* [56]. For details of the IMSS project, please refer to the book by Lindberg, Voss and Blackmon [57].

Aiming to discover the relationship between the strategic fit of servitization and the business performance, 343 manufacturing companies which have obtained turnover through services are selected as the research sample from IMSS-V. This sample comprises respondents from 20 regions (number of respondents): Belgium (13), Brazil (13), Canada (10), China (33), Denmark (12), Estonia (17), Germany (19), Hungary (24), Ireland (1), Italy (35), Japan (13), Korea (20), Mexico (9), Netherlands (28), Portugal (2), Spain (14), Switzerland (26), Taiwan (13), UK (17), and USA (24).

5.2. Variables and Measurement

Three groups of variables are required to reveal the relationship between strategic fit of servitization improvements and business performance, *i.e.* service orientation of competitive strategy (SOS), servitization improvement actions (SIA) and business performance (BP). IMSS-V applies 1-5 Likert scale to measure these variables.

5.2.1. Service Orientation of Competitive Strategy: The service orientation of competitive strategy is measured through the “strategic emphasis on customer service”. Besides “superior customer service”, there are 11 competitive priority (cp) variables: lower selling prices, superior product design and quality, superior conformance to customer specifications, more dependable deliveries, faster deliveries, wider product range, offer new products more frequently, offer products that are more innovative, greater order size flexibility, environmentally sound products and processes, and committed social responsibility.

Every respondent will give a score for every competitive priority according to its importance from 1 to 5 separately. To clearly measure the service orientation of strategy, a new variable will be counted to reflect the relative strategic emphasis of customer service among all competitive priorities. The service orientation of competitive strategy (SOS) is counted as follows:

$$SOS = cps - \overline{cp} \quad (1)$$

Where *cps* is the importance score of customer service of every respondent; is the average importance score of all 12 competitive priorities of every respondent. Bigger difference represents stronger service orientation of competitive strategy. This measurement is similar to Lay, Copani, Jäger and Biege [5], which measured the “level of service strategic orientation” as the rank of services as competitive factors among six strategic aims.

5.2.2. Servitization Improvement Actions: The existing literatures rarely offer scales for the operationalization of servitization improvement actions. Though manufacturing companies should implement many improvement actions to successfully offer services to customer, we focus on three typical and important servitization improvement actions: expanding the service category, developing service-related skills and integrating services with products.

Manufacturing companies can integrate services and products in many ways, while the product design is one of the most important stages which has been highlighted by several scholars [22-58]. Integrating services with products at the new product development stage can decrease many contradictions between products and services at the first beginning and reduce the cost in operations. So, the improvement action “integrating services with products” will be measured as “product design modification”. Other two improvement actions are measured as “service extension” and “service skill improvement”.

5.2.3. Business Performance: Most researches on the relationship between servitization and business performance focused on the financial performance, such as revenue/turnover [5-13] or profitability [15]. Eggert, Högrove, Ulaga and Muenkhoff [59] stated that empirical research on the financial implications of industrial service strategies is still at an early stage and advocated disentangling the revenue and profit implications of industrial service strategies. We are not interested in the specific impacts of servitization improvement actions on different business performance variables. So to simplify the research, one business performance variable is synthesized based on four variables. The detailed information about the scale and measurement of variables are shown in Table 1.

Table 1. Variables

Construct	Variables and codes	Scales
Emphasis on customer service (<i>cps</i>)	Emphasis on customer service (<i>cps</i>)	“Strategic importance of superior customer service (after-sales and/or technical support) to win orders in last three years” (1=not important, 5=very important)
Servitization improvement actions (<i>SIA</i>)	Service extension (<i>SIA1</i>)	“Effort of last three years to actively engage in expanding the service offering to your customers (<i>e.g.</i> by investing in new service development)” (1=none, 5=high)
	Service skill improvement (<i>SIA2</i>)	“Effort of last three years to actively develop the skills in the organization needed to improve the service offering” (1=none, 5=high)
	Product design modification (<i>SIA3</i>)	“Effort of last three years to deliberately design products so that the after sales service is easier to manage/offer (<i>e.g.</i> by using design for manufacturing/assembly/maintenance/service)” (1=none, 5=high)
Business performance (<i>BP</i>)	Sales (<i>BP1</i>) Market share (<i>BP2</i>) Return on sales (<i>BP3</i>) Return on investment (<i>BP4</i>)	“Compared to three years ago what is the current business unit performance?” (1=deteriorated more than 5%, 2=stayed about the same -5%/+5%, 3=improved 5%-15%, 4=improved 15%-25%, 5=improved more than 25%)

A correlation matrix for these items is presented in Table 2.

Table 2. Correlations

Variables	n	Mea	Std	A	B	C	D	E	F	G	H
A-service orientation of competitive strategy	324	0.39	0.776	1							
B-service extension	341	3.20	1.136	0.124	1						
C-service skill improvement	341	3.34	1.057	0.144	0.712	1					
D-product design modification	341	3.26	1.131	0.148	0.448	0.578	1				
E-sales	339	2.73	1.365	-	0.095	0.113	0.089	1			
F-market share	334	2.67	1.002	-	0.138	0.140	0.152	0.634	1		
G-return on sales	323	2.51	1.116	-	0.085	0.125	0.077	0.601	0.555	1	
H-return on investment	317	2.52	1.069	-	0.114	0.158	0.095	0.536	0.600	0.824	1

*Correlation is significant at the 0.05 level (Pearson Correlation, 2-tailed);

**Correlation is significant at the 0.01 level (Pearson Correlation, 2-tailed).

The IMSS questionnaire is designed by excellent scholars and specialists in operations management and strategy management, and translated by local scholars, which strengthen the scientificity and professionalism of the survey. Since 1992, the IMSS database have been testified and improved by many participants and scholars. Furthermore, we testify the reliability and validity of the IMSS-V through Cronbach's α test and factor analysis method. The value of Cronbach's α of variables is all above 0.8, indicating acceptable internal consistency [60]. The factor loadings are all above 0.4 and the cumulative proportions of explained variance of common factor are all above 50%, indicating a sound construct validity of the data. Table 3 is the test results of reliability and validity.

Factor analysis method is applied to simplify the "business performance". Principal component analysis method and Eigenvalue over 1 are used in factor extraction, varimax method is applied in factor rotation, and regression method is used to estimate factor score. The KMO and Bartlett test shows that this factor analysis is acceptable and reliable (Table 3). One factor is extracted to represent the business performance. The following empirical analyses are based on the factor scores of business performance.

Table 3. Test of Reliability and Validity

Variables	Code	Factor loading	KMO	Bartlett's Test of Sphericity (Sig.)	Eigenvalue	Cumulative proportion of explained variance (%)	Cronbach's α
Service orientation of competitive strategy (SOS)	SOS	-	-	-	-	-	-
Servitization improvement actions (SIA)	SIA1	0.855					
	SIA2	0.909	0.649	0.000	2.164	72.132	0.802
	SIA3	0.779					
Business performance (BP)	BP1	0.818					
	BP2	0.822	0.723	0.000	2.897	72.436	0.866
	BP3	0.884					
	BP4	0.878					

5.3. Data analysis Method

Venkatraman [61] identified six perspectives of fit and highlighted the necessity of corresponding schemes by which fit will be tested. This research investigates the first type of strategic fit *i.e.* moderation, which specifies existence of the moderation effect where the relationship between the independent variables (servitization improvement actions) and the dependent variable (business performance) is influenced by the level of a third variable (service orientation of competitive strategy).

The moderation effect analysis explains whether or not one relationship will change under different conditions. All hypotheses will be testified by the hierarchical regression analysis method which is an important method to reveal the moderating effect [62]. Before the regression analysis, the variable “servitization improvement actions” will be standardized and three interaction variables “SIA1*SOS”, “SIA2*SOS” and “SIA3*SOS” will be counted as new independent variables.

According to the conceptual model and hypotheses, 3 systems of equations will be formulated firstly to test the moderation effects of three interaction variables separately. All relevant independent variables are entered in the regression models at the same time in each step. The test of the significance of ΔR^2 and the *t* test of the coefficients of the interaction variable will decide whether the moderating effects exist or not. After the hierarchical regression analysis, the moderating effects will be analyzed in depth to show how “service orientation of competitive strategy” moderates the relationship between the “servitization improvement actions” and “business performance”.

In the process of analysis, the “exclude cases listwise” method is applied to solve the missing data problem. All analyses in this research are implemented by SPSS 13.0.

6. Results

6.1. The Strategic Fit of the Service Extension and Business Performance

The regression results in Table 4 show that the service orientation of competitive strategy (SOS) moderates the relationship between the service extension (SIA1) and business performance. It suggests that the strategic fit of “service extension (SIA1)” significantly influences the business performance of manufacturing companies (Model1c, Std. coefficients of SIA1*SOS=0.121, $\Delta R^2=0.014$, $p<0.05$).

Table 4. Regression Results of Service Extension

Models	Dependent variable: business performance		
	1a	1b	1c
Independent variables			
<i>SIA1</i>	0.098*	0.108*	0.084
<i>SOS</i>		-0.063	-0.072
<i>SIA1*SOS</i>			0.121**
R ²	0.010	0.013	0.027
Adjusted R ²	0.006	0.007	0.017
ΔR ²	0.010	0.004	0.014
F for the change	2.845*	1.136	4.146**
F for the regression	2.845*	1.991	2.724**

Note: Regression coefficients are standardized betas. *p<0.10, ** p<0.05.

The interaction captured in Figure 3 shows the direction of the relationship between “service extension (SIA1)” and business performance, when service orientation of competitive strategy (SOS) is “high” (line A-B) and when SOS is “low” (line C-D).

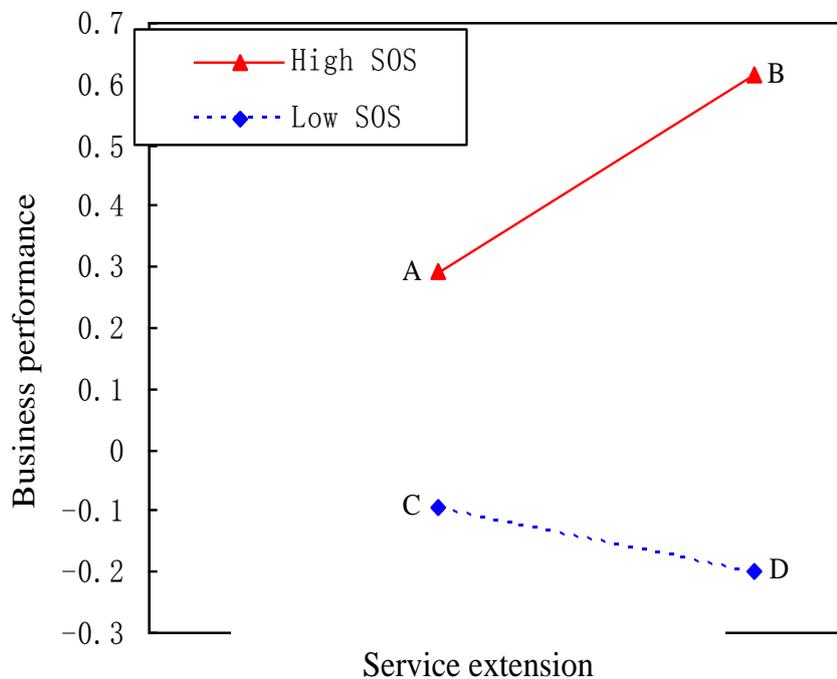


Figure 3. The Moderating Effect of SOS on SIA1-BP

Referring to Figure 3, when the service orientation of competitive strategy (SOS) is high, business performance increases as SIA1 increases (line A-B); when SOS is low, business performance decreases as SIA1 increases (line C-D). When the service orientation of a manufacturer is strong, more “service extension” (from A to B) will increase the business performance; conversely, when the manufacturer has weaker service orientation of strategy, more “service extension” will reduce the business performance. Hypothesis H1 is accepted.

6.2. The Strategic Fit of the Service Skill Improvement and Business Performance

The regression results in Table 5 show that the service orientation of competitive strategy (SOS) moderates the relationship between the service skill improvement (SIA2) and business performance. It suggests that the strategic fit of “service skill improvement

(SIA2)” significantly influences the business performance of manufacturing companies (Model2c, Std. coefficients of $SOS*SIA2=0.118$, $\Delta R^2=0.014$, $p<0.05$).

Table 5. Regression Results of Service Skill Improvement

Models	Dependent variable: business performance		
	2a	2b	2c
Independent variables			
<i>SIA2</i>	0.128**	0.141**	0.122**
<i>SOS</i>		-0.071	-0.075
<i>SIA2*SOS</i>			0.118**
R ²	0.016	0.021	0.035
Adjusted R ²	0.013	0.014	0.025
ΔR^2	0.016	0.005	0.014
F for the change	4.849**	1.463	4.070**
F for the regression	4.849**	3.160**	3.486**

Note: Regression coefficients are standardized betas. * $p<0.10$, ** $p<0.05$.

The interaction captured in Figure 4 shows the direction of the relationship between “service skill improvement (SIA2)” and business performance, when service orientation of competitive strategy (SOS) is ‘high’ (line A-B) and SOS is ‘low’ (line C-D).

Referring to Figure 4, when the service orientation of competitive strategy (SOS) is strong, business performance increases as SIA2 increases (line A-B); when SOS is weak, business performance increases as SIA2 increases (line C-D). But the slope of line A-B is apparently greater than the slope of line C-D. The result shows that the service skill improvement will increase the business performance no matter the service orientation of business strategy is high or low. Furthermore, Figure 4 indicates that if a manufacturing company formulates a highly service-oriented strategy, the service skill improvement will offer better business performance. Hypothesis H2 is partly accepted.

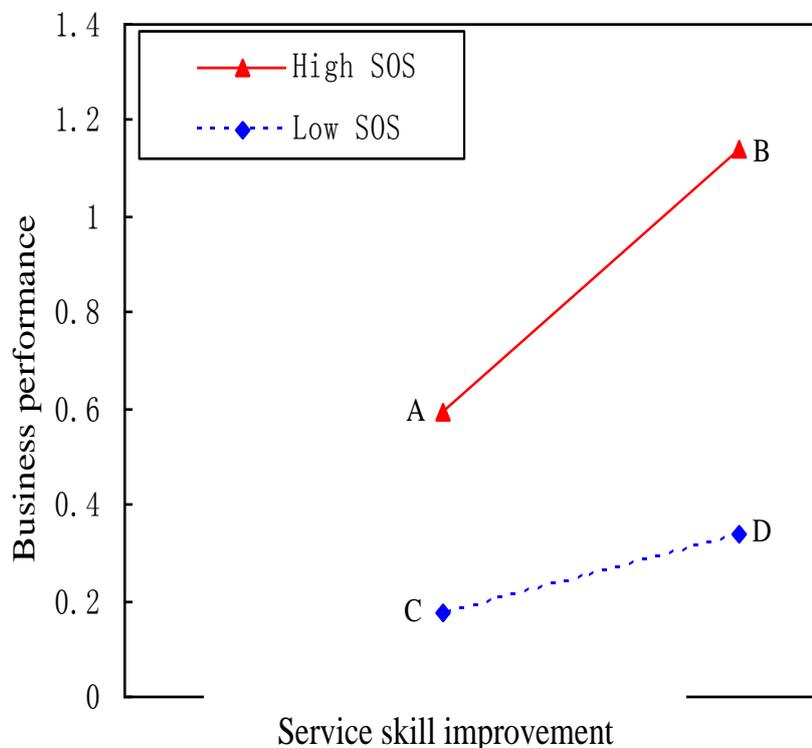


Figure 4. The Moderating Effect of SOS on SIA2-BP

6.3. The Strategic Fit of the Product Design Modification and Business Performance

The regression results in Table 6 show that the service orientation of competitive strategy (SOS) does not moderate the relationship between the product design modification (SO3) and business performance. There is no significant relationship between the strategic fit of product design modification and business performance. Hypothesis H3 is rejected.

Table 6. Regression Results of Product Design Modification

Models	Dependent variable: business performance		
	3a	3b	3c
Independent variables			
<i>SIA3</i>	0.091	0.101*	0.102*
<i>SOS</i>		-0.061	-0.059
<i>SIA3*SOS</i>			-0.018
R ²	0.008	0.012	0.012
Adjusted R ²	0.005	0.005	0.002
ΔR ²	0.008	0.004	0.000
F for the change	2.452	1.067	0.094
F for the regression	2.452	1.760	1.201

Note: Regression coefficients are standardized betas. *p<0.10.

7. Conclusions

The results show that the strategic fit of service extension and the service skill improvement positively influence the business performance. Though the service orientation of competitive strategy and improvement actions are all important to the servitization, no single part can create better business performance without good fit to each other. The strategic fit is vital to the success of servitization.

Servitization improvement actions require huge investments [40, 63], and will influence traditional manufacturing paradigm and practices. These investments in required resources and capabilities or organizational and managerial difficulties with managing services will result in higher costs [59]. So, if servitization improvement actions are inconsistent with competitive strategy, the investments and higher costs will erode the business performance. On the contrary, keeping good strategic fit, servitization improvement actions will offer better business performance to manufacturing companies.

The service-oriented strategy is the “locomotive” of servitization transformation. While companies often fail to formulate or implement the service orientated business strategy [12, 44]. Keeping strategic fit might be a good solution to these problems in servitization.

8. Theoretical and Managerial Implications

Eggert *et al.* [59] concluded that empirical research in servitization is still nascent and focused on two issues: (1) the effect of servitization on firm performance and (2) the identification of variables that moderate the effect of servitization on firm performance. In this paper, the moderation effect of service orientation of competitive strategy is investigated, which expressed as strategic fit.

Several scholars have highlighted the importance of alignment in manufacturing servitization and expressed the idea of fit [29], [58],[64-65]. But the research on strategic fit of servitization is limited (*e.g.* Gebauer; Neu and Brown) [43-49], empirical research is lacking especially. This research extends the strategic fit theory to this new domain and enriches the theoretical research of servitization simultaneously. And the findings about the significant casual relationship between strategic fit of two servitization improvements and business performance reveal the conditions when the servitization will create better business performance to manufacturing companies.

Windahl [66] concluded that “extending the service offering” and “changing strategies” are two different points of departure in the literature on servitization. In the extended service offering stream of literature, researchers omitted the connection between manufacturing and service, instead of arguing for isolating service operations and personnel from the manufacturing and product operations. In the strategic literature stream, many researches are prescriptive and normative, and focus on the final “ideal state” and not on the actual process of getting there. This research analyzes the servitization through a more integrated and systematic way by avoiding the shortcomings of two current research streams to some degree. On the one hand, this research investigates the servitization based on three particular improvement actions; on the other hand, the strategic fit is investigated to reveal how servitization can improve the business performance.

Manufacturing companies have strived after the servitization for decades. Though IBM, GE, and R&R *et al.* have achieved success, there are still challenges and puzzles to most traditional manufacturing companies around the world. Companies that fail to continuously invest in their service business, for example, by not sufficiently broadening their service portfolio, take the risk of missing an opportunity to increase revenues and profits and compensate for possible initial profit losses [59]. Keeping good strategic fit will unify the thoughts and actions in servitization transition, allocate necessary resource to support servitization, and help manufacturing companies achieve better business performance through servitization.

9. Research Limitations and Future Research

Not only the servitization improvement actions should keep strategic fit, but also the organization structure, the attitudes and reactions towards the servitization of managers of different levels/functions should achieve harmony. These kinds of “fit” should be analyzed in the future. Furthermore, more improvement actions should be analyzed, and how to successfully implement these improvement actions is also needed in depth investigation. Moreover, future research efforts should be directed towards including several contingency effects in the analysis such as region, size of the organization *et al.*

IMSS is a comprehensive survey project about manufacturing strategy. It is not exclusively designed for the servitization research which constrains the research. Besides this, the small R^2 of the regression results limits the explanation power of the findings which need improvement in the selection of sample and analysis method.

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