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Value Cocreation in New Service Development: A Process-based View of Resource Dependency

Qiang Wang*

Department of Innovation, Entrepreneurship, and Strategy

The School of Management, Xi'an Jiaotong University (XJTU)

Ilan Oshri

The University Auckland Business School, Auckland, New Zealand

Xiande Zhao

Department of Economics and Decision Sciences

China Europe International Business School (CEIBS)

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* Corresponding author: Qiang Wang (qiangwang@xjtu.edu.cn). Address: Department of Innovation, Entrepreneurship, and Strategy, School of Management, Xi'an Jiaotong University (XJTU), No. 28 Xianning West Road, Beilin District, Xi'an, China 710049.

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Abstract

Purpose – The purpose of this study is to examine value cocreation between service firms, their business partners and customers at different stages of the new service development (NSD) process.

Design/methodology/approach – The study explored hypotheses proposing that due to different resource dependencies of the focal firm in three NSD stages (ideation, development, and deployment), customers and partners play different roles in the NSD process. Empirical data were collected from 200 NSD projects, and structural equation modeling was used to test the hypothesized relationships.

Findings – The results show that customer value cocreation has a positive effect on ideation performance and development performance, while business partner value cocreation has a positive effect on deployment performance, thus supporting the notion that the contributions of customers and business partners vary across the NSD stages.

Research limitations/implications – Future research may focus on how business partners can be actively involved in the NSD process and how to safeguard different parties' interests during value cocreation. Longitudinal data may be used to better examine the process dynamics.

Practical implications – The study provides managerial implications for service managers in acquiring and allocating the resources needed from customers and business partners across the various NSD processes.

Originality/value – The study contributes to the growing literature on NSD and service innovation by empirically showing the respective performance contribution of customers and business partners during different stages of NSD and shedding light on the value cocreation mechanisms from the perspective of resource dependence theory.

Keywords: Value cocreation; new service development; service innovation; resource dependency; empirical study

Paper type: Research paper

1. Introduction

Value cocreation activities in new service development (NSD) between focal firms and their business partners and customers have attracted research attention in recent years. Value cocreation is understood as a symbiotic relationship between an organization and its primary stakeholders (i.e., its clients or partners) to co-produce and customize services (Sarker *et al.*, 2012). In this regard, value is co-created through interactions that are associated with resource exchange and sharing (e.g., Grover and Kohli, 2012), mutual learning (e.g., See-To and Ho, 2014), relationship building (e.g., Luo *et al.* 2015; Simões and Mason, 2012), and collective governance (e.g., Grover and Kohli, 2012; Sarker *et al.*, 2012). Indeed, one key aspect of research on value cocreation is the relative contribution of each party (i.e., focal firm, business partners and customers) to the success of the NSD. For example, it has been reported that business partners have more influence on value cocreation in the development stage for tangible goods (Petersen *et al.*, 2003, 2005; van Echtelt *et al.*, 2008), as compared to their contribution to NSD (Ordanini and Parasuraman, 2011). Others have argued that customer participation in NSD is key to its success, and often more significant than customer contribution to the development of tangible goods (Alam and Perry, 2002).

Rooted in a service-dominant logic (Vargo and Lusch, 2004), the value cocreation literature suggests that a firm's value creation often requires resources from its customers, employees, suppliers, and other network partners (Vargo *et al.*, 2008; Vargo and Lusch, 2011). While the NSD literature has acknowledged that both customers and business partners play critical roles in creating value for the focal firm (Ordanini and Parasuraman, 2011; Melton and Hartline, 2010), the degree to which each party co-creates value during NSD process is unclear. In this regard, while the extant literature indeed acknowledges the numerous stages in NSD (Nambisan, 2002), it sheds little

light on the changing contribution of business partners and customers to value cocreation during different NSD stages. Further, each stage in the NSD is likely to require different resources from the involved parties, therefore subjecting value cocreation to resource-dependency (Hillman *et al.*, 2009). For example, the early stage of NSD is likely to be heavily reliant on information as a resource (Nambisan, 2002) to help in shaping the idea of the service, while specialised expertise (Nambisan, 2002; Roth and Menor, 2003; Al-Zu'bi and Tsinopoulos, 2012) and physical capital (Froehle and Roth, 2009) will be required in the later stages to develop and deploy the service. As such, we frame value cocreation in NSD as a resource-dependency challenge and seek to unveil the relative effect of customers and business partners, subject to the focal firm's needs and behaviours during the innovation.

The focus of this paper is therefore value cocreation in NSD subject to the involvement of customers and business partners at different NSD stages. Indeed, the extant literature proposes several similar NSD stage models. For example, Johnson *et al.* (2000) present a four-stage NSD model that includes design, analysis, development, and launch stages. We have chosen to adopt the framing used by Nambisan (2002) and Melton and Hartline (2010) to focus on ideation, development, and deployment (including launch and post-launch deployment) as key stages of the NSD process. Research on value cocreation has traditionally examined the business-to-consumer context (Lambert and Enz, 2012), with little reference to and therefore limited understanding of NSD stages and partner involvement in the business-to-business (B2B) context. Several case studies have supported the necessity to explore value cocreation in B2B services (e.g., Chowdhury *et al.*, 2016; Komulainen, 2014; Lambert and Enz, 2012). Indeed, the role of customers and partners as co-creators is suggested to be more evident in relation to industrial products than consumer products (Garvin, 1988;

Nambisan, 2002), and there are also cases that companies may oppress value cocreation by consumers (e.g., Lee and Soon, 2017). As such, this study focuses on the involvement of business customers and partners in B2B services.

To study value cocreation between focal firms and their customers and business partners in different stages of the NSD, we tested the stage model using empirical data collected from 200 NSD projects in various service industries associated with information and communication technologies. The results generally support our claim that customer value cocreation is associated with NSD performance in the early stages and diminishes toward the later stages of NSD, while business partner value cocreation increases performance toward the later stages of NSD. In this regard, our study contributes to the growing literature on NSD and service innovation by empirically showing the respective performance contribution of customers and business partners during different stages of NSD and shedding light on the value cocreation mechanism from the perspective of resource dependence theory. Contrary to our expectations, business partner value cocreation is not associated with NSD performance in the development stage, yet the effect of customer value cocreation still manifests in the development stage, which also enriches our understanding of focal firms' resource dependencies and critical challenges in the NSD process.

2. Literature review and theoretical framework

2.1. Customers and business partners in NSD

Customers play a range of roles in the development of new services and products (e.g., Nambisan, 2002; Bonner and Walker, 2004; Fang, 2008). Kristensson, Gustafsson, and Archer (2004) argue that one important contribution of users applies to the idea generation phase (as sources of creative ideas) in the process of new product development (NPD), while Nambisan (2002) points out that "customers can be

involved not only in generating ideas for new products but also in co-creating them with firms, in testing finished products, and in providing end user product support" (p. 392). Furthermore, Nambisan (2002) proposes that in different development stages (ideation, design and development, product testing and support), customer roles range from providing resources to being co-creators and users, respectively. In this regard, Fang (2008) empirically differentiated two roles of the customer—as information resource and co-developer, while Lusch and Nambisan (2015) identified three broad roles of the customer, namely ideator, designer, and intermediary. Christensen (1997) cites the case of the disk drive development, where the idea for smaller-sized hard drives actually emerged from interactions with personal computer users. Different to manufactured goods, inseparability is recognized as an important characteristic of services, which require more intensive interaction between service firms and their customers (Menor *et al.*, 2002).

Alongside customers, business partners also play a critical role in focal firms' innovations. Lusch and Nambisan (2015) suggest that innovations such as NSD no longer develop "from within the confines of an organization; instead, they evolve from the joint action of a network of actors ranging from suppliers and partners to customers and independent inventors" (p. 155). Wang *et al.* (2016) found that collaboration with suppliers contributes to the innovativeness of firms, and this effect is more significant for service firms compared to manufacturing firms. Collaboration with customers or business partners (such as suppliers) in innovation has been widely addressed in the literature. However, with regard to innovation (or NPD/NSD), prior studies have focused on the development stage or viewed the different stages as a whole, which leaves room for a process approach that examines the different roles of customers and partners in the different stages. Insufficient understanding of the differences across

stages when involving customers and business partners in innovation may lead to inefficient management of the collaborative process by focal firms. For example, the two roles of the customer – as information resource and co-developer – identified by Fang (2008) may not be simultaneously exercised at every stage of the development process for new services. Failures of collaboration initiatives are often reported as due to a lack of attention to the process dynamics (Fawcett *et al.*, 2012). A more in-depth view of the process dynamics will enable previous understandings to be extended and enriched.

2.2. NSD process models

Prior research has also proposed various process models for NPD (e.g., Booz *et al.*, 1982) and NSD (e.g., Voss, 1992; Johnson *et al.*, 2000). Menor, Tatikonda, and Sampson (2002) argue that NSD process models have exploited the basic stages of NPD processes and provided new extensions to extend and enrich understanding of the process in terms of the facilitating conditions, activities and outcomes. Further, Alam and Perry (2002) suggest that a major difference between service and product development is the intensive customer involvement in services.

Among NSD process models, Johnson *et al.*'s (2000) four-stage model is commonly adopted. This model "captures the basic steps shared by most process models in the NSD literature and succinctly reduces process steps to four general stages: design, analysis, development, and full launch" (Melton and Hartline, 2010, p. 412). The design stage involves the formulation of new service objectives and strategy, idea generation and screening, and concept development. In the stage of analysis, the potential profitability of the project is assessed, specifically with regard to whether the project team should proceed. The development stage, on the other hand, is more complex and involves service design and testing, process and system design and testing,

marketing program design and testing, operational and frontline personnel training, and a pilot project. The final stage is the full-scale launch of the service to the targeted markets. This four-stage process model has been adopted or adapted by numerous studies including Menor, Tatikonda, and Sampson (2002) and Melton and Hartline (2015).

In the four-stage model, the design stage is mainly about the generation and screening of ideas and service concepts, often referred to as the fuzzy front-end in the innovation process (Alam, 2006). Nambisan (2002) also emphasizes the importance of idea generation and the resources needed in the ideation stage. From the perspective of resource dependence (Pfeffer and Salancik, 2003), in this stage firms are dependent on others and have to form cooperative relationships to gain access to needed external resources in order to reduce uncertainty (i.e., fuzziness) in innovation. The analysis stage in the four-stage model does not involve much activity (as it only covers business analysis and project authorization), thus firms will be less dependent on others in this stage. Prior research on collaborative innovation has often ignored this stage, or merged it with the design stage. Further, some claim that the deployment of service innovations has received insufficient attention (Costa and Dierickx, 2005; Wang *et al.*, 2019). As such, we include the fuzzy front-end design stage as part of the ideation stage (covering both design and analysis), and thus focus on three main stages of NSD, namely ideation, development, and deployment (covering launch and post-launch activities). The respective value cocreation activities between a focal service firm and its business partners and customers will be examined across these three stages. This approach responds to calls for methods to capture how value is created and to understand value creation processes in service innovation (Patrício *et al.*, 2018).

2.3. Resource dependency in NSD

The resource dependence theory suggests that firms' actions are mainly driven by their resource considerations, and the resource complementarity among them determines their relationships and interactions (Pfeffer and Salancik, 2003; Hillman *et al.*, 2009). The NSD literature has so far provided evidence that value cocreation is an outcome of resources provided by key players, including customers (Yu and Sangiorgi, 2018). Although value creation may involve both economic value and social value (Gassenheimer *et al.*, 1998), in the NSD process the value is specific to economic value in terms of the innovation outcomes (Ordanini and Parasuraman, 2011). In this regard, we see a resource dependency in how specific value is co-created in the various stages of NSD. Indeed, resource dependence theory assumes a link between external resources and the firm's behaviour, including strategic objectives. As such, the firm's ability to procure both tangible and intangible resources from external players is considered key for its success. For example, Melton and Hartline's (2010) study showed that resources contributed by customers during the development stage have little effect on service marketability, thus suggesting a lower degree of resource dependency by the focal firm at this stage. On the other hand, resources contributed by customers during the design stage signal a high degree of resource dependency by the focal firm as these resources contribute to service marketability. Christensen (1997) also suggests that because customers provide the resources upon which the firm is dependent, it is the customers who direct managers' resource allocation and exert a profound influence on patterns of innovation. Accordingly, we frame value cocreation as a resource dependency challenge in which resources contributed during the various stages of NSD co-create value only when the focal firm depends on them to meet its objectives for different stages.

Past studies that have examined the resources required for NSD highlight the centrality of information for the design stage (Alam, 2006), expertise for the development stage (Nambisan, 2002) and capital for the deployment stage (Froehle and Roth, 2009). The front-end, i.e., the ideation stage, is the most information intensive (Zahay *et al.*, 2004). To reduce uncertainty in the front-end, information from external sources (e.g., customer needs and market information) is the most critical resource for the ideation stage. In the development stage, the expertise and intellectual capital embedded in people and systems are crucial for the success of new services (Roth and Menor, 2003; Oke, 2007). In the deployment stage, when the new service is launched to target markets and/or further deployed, financial capital and marketing resources for promotion and advertising become more critical (Froehle and Roth, 2009). Therefore, from the perspective of value cocreation and resource dependency, we propose a staged research framework to investigate the cocreation outcomes of customer and business partner involvement in the ideation, development, and deployment stages of the NSD process.

--- *Insert Figure 1 about Here* ---

3. Hypotheses development

3.1. Value Cocreation in Ideation

The stage of idea generation is the starting block for an NSD project. We argue that the value cocreation activities in ideation are mainly information driven, as information is the key resource the firm is dependent on (Rochford, 1991; Alam, 2006; Yu and Sangiorgi, 2018). Indeed, the important contributions of customers in the idea generation phase are acknowledged in prior research (Nambisan, 2002; Kristensson *et al.*, 2004; Fang, 2008). Alam and Perry (2002) provide support for customer

involvement in idea generation influencing the success of new service ideas. They argue that rather waiting for customers to come forward with ideas, service firms should reach out to customers to seek their ideas. Indeed, Alam (2006) provided additional support for the dependency of the focal firm on information provided by customers, quoting a CEO from one of the case studies stating that: "Our clients have a much better access to overseas markets' information. Obtaining that information was easy and quick via customer interaction" (p. 473).

In addition to customers, partners in the business network are also external sources of information (Zahay *et al.*, 2004). Network partners with technological collaborations can provide information including news of technical breakthroughs and new insights to problems (Ahuja, 2000). Key partners such as suppliers can "provide the technical expertise to evaluate the feasibility of new product ideas during the early stages of NPD before large financial investments have been made" (Al-Zu'bi and Tsinopoulos, 2012, p. 669). Wang *et al.* (2016) also suggested that suppliers' roles in both service and manufacturing innovation may involve consultation on design ideas. However, since success in the ideation stage is mainly dependent on understanding customers' needs (current and potential), we expect that customer involvement in the ideation stage should make a greater contribution to the innovativeness of new service concepts generated compared to the involvement of business partners. We thus advance the following hypothesis:

H1. *In the ideation stage of service innovation, due to the dependence on information, customer value cocreation has a stronger positive effect on service concept newness than business partner value cocreation.*

3.2. Value Cocreation in Development

The development stage has been at the centre of many studies on new service or product development. Indeed, extant literature proposes that in this stage, success is tightly linked to the ability of the firm to co-develop the service with stakeholders, both customers and business partners (Fang, 2008). As such, we view resource dependency in this stage as revolving around the expertise needed for co-development of the service. Because customers are viewed as predominately providing information (Fang, 2008), they are involved in testing and customer-relationship training (Melton and Hartline, 2010) rather than actual co-development activities.

The involvement of business partners in the development stage, on the other hand, is often described as a building block in the delivery of a new service. Indeed, business partners such as suppliers are frequently responsible for the development of specific components or even whole systems (Wang *et al.*, 2016). Yu and Sangiorgi (2018) describe the case of "Partner Zone", a website designed to enable teachers to easily access and introduce the work to their students in classes. In this case, the designers conducted user-centred research and generated service ideas and prototypes, while collaborating with stakeholders (partners) to develop the website. As such, the focal firm's ability to integrate its abilities with business partners' expertise is critical for the success of the development stage. While involving customers in the development stage is key to testing and the development of a customer-friendly service (Edvardsson and Olsson, 1996), business partners are viewed as offering greater value to the development stage by contributing expertise when components and service platforms are co-developed (Al-Zu'bi and Tsinopoulos, 2012; Fu *et al.*, 2017). As such we advance the following hypothesis:

H2: *In the development stage of service innovation, due to the dependence on development expertise, business partner value cocreation has a stronger positive effect on development performance than does customer value cocreation.*

3.3. Value Cocreation in Deployment

The success of the launch and deployment stage is dependent on marketing resources (Vorhies and Morgan, 2003; Fang, 2008) and financial capital (Froehle and Roth, 2009). Wang *et al.* (2019) found that the lack of an appropriate partner involved in deployment may lead to a market failure. They therefore argue the deployment stage requires a marketing effort as well as a strategy to mitigate potential risks. In one of their ten cases, "Synergistic classroom", the deployment of the new service was actually undertaken by an external partner with marketing resources to deploy it to the target market (i.e., local schools in different cities). Customers can support marketing efforts by providing a word of mouth testimony (Brown *et al.*, 2005). Yet, as markets are saturated with competing services, firms need to invest in marketing campaigns to signal their superior abilities compared to competing services, as well as to inform potential buyers of their services (Petersen *et al.*, 2005; van Echtelt *et al.*, 2008). Thus, orchestrating a service deployment with business partners requires a joint risk mitigation approach involving joint investment of capital to ensure that services are available and potential buyers are informed of the value delivered (Chien and Chen, 2010). As such we expect that business partners play a greater role than customers in the deployment sage, and accordingly propose that:

H3: In the deployment stage of service innovation, due to the dependence on marketing resources and the need to share potential risks, partner value cocreation has a stronger positive effect on deployment performance than does customer value cocreation.

4. Method

4.1. Sampling Design and Data Collection

To empirically test the hypotheses, we randomly selected 1000 companies from the four first-tier cities in China, namely Beijing, Shanghai, Shenzhen and Guangzhou. The sampling pool consisted of service firms listed in the database of the National Bureau of Statistics and headquartered in any of the four cities. Based on the classification of industries in China (national standard GB/T 4754-2011), we selected "Category I: information communication, software, and IT services", as these industries have been the most prosperous in recent years in terms of service innovation.

This study focuses on the value cocreation activities in NSD process, thus the unit of analysis is the NSD project. Through a pilot test of the questionnaire, feedbacks were gathered, suggesting that it was better to recruit project leaders as the key informants, as they are knowledgeable and familiar with NSD activities. The survey was conducted from 2015 to 2016, and one of the largest professional survey companies in China was employed to collect the data. First, the survey company trained its data managers about the data collection criteria and process. Randomly selected companies were then contacted by data managers via telephone to gather contact information for the most suitable respondents. Each firm was asked to provide contact information for no more than two service innovation projects being run by different leaders. Finally, an appointment with each informant was made by a data manager, who would then take a printed copy of the questionnaire and conduct an on-site visit to collect the data from the informant. As the questionnaire surveyed different stages of the NSD process, before asking questions with regards to each stage, the data managers would explain to the informants how the three stages are divided and what each stage is mainly about. Our study uses ideation stage to include both design and analysis activities for new

service ideas and concepts (also covering the fuzzy front-end); development stage covers service design and testing, process and system design and testing, marketing program design and testing, personnel training, service testing and pilot run; deployment stage covers full-scale launch of the service to the targeted markets, and post-launch deployment activities. We also asked the data managers to pause for five minutes before asking questions about the next stage. Finally, the data collection efforts resulted in 200 usable questionnaires for service innovation projects from 141 companies, giving a response rate of 14.1%.

4.2. Instrument Development

To measure the constructs in this research, we first reviewed the literature and involved relevant scholars and practitioners from various service companies. Specifically, we invited four professors (three in operations management and one in marketing), who had rich research and teaching experiences in both Chinese and Western universities, to assist with the design of measurement items. Sixty managers of service innovation projects were invited to participate in the pilot test. We conducted face-to-face interviews with them to check the appropriateness of the measurements and examine if there were any missing aspects. The questionnaire was developed using languages of both English and Chinese, thus two-way translations were conducted. The resulting measurement items are listed in Table I.

Ideation performance was measured according to the innovativeness of new service concepts, as captured by three items for the newness of service (see Table I). The 7-point Likert scale was used, with '1' indicating 'strongly disagree' and '7' for 'strongly agree'. The question was framed as follows: "Before the actual development of this innovation, we thought the concept of this new service had the following characteristics". The respondent was asked to indicate his/her level of agreement.

Development performance was measured by three items regarding speed, and deployment performance was measured using three items for efficiency in terms of speed, cost and other objectives, as adapted from previous studies including Melton and Hartline (2010), Carbonell *et al.* (2009), and Avlonitis *et al.* (2001).

Customer value cocreation and business partner value cocreation were measured by items adapted from Ordanini and Parasuraman (2011) and Gruner and Homburg (2000). The respondent was asked to indicate his/her degree of agreement regarding statements about the customer's or business partner's involvement and collaborative activities during the idea generation stage, the development stage, and market launch and deployment stage, respectively.

4.3. Respondent Profile

A wide variety of service innovation projects were covered. Respondents mainly included top management and general managers, and the average size of project teams was 11.86 members. The average project development investment was 2.22 million RMB, and the average project deployment investment was 0.86 million RMB.

5. Analysis and results

5.1 Common Method Variance

As we collected data from a single informant per project, common method bias might be a problem (Podsakoff *et al.*, 2003). First, as the appropriate arrangement of the measurements in a questionnaire could help mitigate informants' motivation of consistency and reduce common method bias consequently (Podsakoff and Organ, 1986), this study provided different instructions to different scales, and put adjacent variables in the theoretical model in distinct questionnaire sections. Second, to confirm the success of this strategy, a test recommended by Podsakoff *et al.* (2003) was

conducted. In particular, adopting the analysis procedure used by Liang *et al.* (2007), we compared two measurement models, with one having all the traits and the other adding in a method factor. We found that the path coefficients were insignificant and subtle. Third, the correlation matrix was examined to see whether high correlations existed, as Pavlou *et al.* (2007) suggest that in cases without excessively high correlations (> 0.9) common method bias will be unlikely. Based on these analyses, it is reasonable to conclude that common method bias does not appear a problem in this study. We also examined the non-response bias by comparing the late and early responses for number of employees, number of project team members and some other variables (Armstrong and Overton, 1977), while the t-tests did not show significant differences, suggesting that non-response bias is not likely to be a problem.

5.2. Reliability and Validity

This study followed a rigorous process in the development and validation of instruments. To ensure the content validity of all the constructs, an extensive review of prior literature and executive interviews and pilot tests were conducted. Then a series of analyses of the data were conducted to examine constructs reliability and validity.

Exploratory factor analyses (EFA) was conducted using both orthogonal and oblique rotations, and the results showed that all items loaded well onto the hypothesized factors and there were no significant cross-loadings. For all the constructs, Cronbach's alpha values (Table I) were hinger than 0.7, indicating a good reliability. Following Hair *et al.* (2006), the composite reliability (CR) and the average variance extracted (AVE) were also used to assess construct reliability. When AVE is over 0.5 and CR is over 0.70, it indicates that the variance by the trait is greater than that by error terms.

Then we examined convergent and discriminant validity as recommended by O'Leary-Kelly and Vokurka (1998). Convergent validity was achieved by showing that all the factor loadings were over 0.50, with *t*-values larger than 2.0.

To check the discriminant validity, the square root of each construct's AVE was compared against its correlations with all the other constructs. If no correlation is greater than the square root of AVE, the discriminant validity between constructs will be achieved (Table II).

--- *Insert Table I about Here* ---

--- *Insert Table II about Here* ---

5.3. Structural Equation Modeling and Results

The hypotheses were tested using structural equation modeling (SEM), with the bootstrapping-based partial least squares (PLS) approach (Hair *et al.*, 2012; Peng and Lai, 2012; Storey and Larbig, 2018). We adopted SmartPLS 3.2.8 version in this research to assess the measurement model and structural model (Ringle *et al.*, 2015). As recommended, 5000 bootstrap samples were derived from the original sample.

In general, the results show that customer value cocreation and business partner value cocreation activities contribute to service innovation performance, but the effects vary in different stages (see Table III). Customer value cocreation has been found a significant positive effect on ideation performance (with a coefficient of 0.204 and $p < 0.05$), and a significant positive effect on development performance (with a coefficient of 0.167 and $p < 0.05$), while its effect on development performance is not significant. On the other hand, partner value cocreation has been found a significant positive effect on deployment performance (with a coefficient of 0.172 and $p < 0.01$), while its effects on ideation performance and development performance are not significant. To test the

hypotheses, the path coefficients for the direct effects in the 5000 bootstrap samples were compared using subtraction, which generated the difference (in terms of effects on performance) between customer value cocreation and partner value cocreation in three stages and respective significance levels as shown in Table III. Specifically, customer value cocreation was found to have a stronger impact in the ideation stage than partner value cocreation (difference = 0.201 and $p < 0.05$, supporting H1), and a weaker impact in the deployment stage (difference = -0.046 and $p < 0.05$, supporting H3). However, customer value cocreation was found to have a stronger impact in the development stage (difference = 0.190 and $p < 0.05$), which rejected H2.

6. Discussion and Conclusion

6.1. Major findings

Our empirical results suggest that in different stages of the NSD process, customers and partners play different roles by providing complementary resources to the focal service firms across the process, contributing to performance indicators of different stages. Consistent with our expectations, customer value cocreation is found to be more crucial in the early stages of NSD, while business partners are more important toward the later stages. In particular, this study reveals that customer value cocreation has a positive effect on ideation performance and development performance, while partner value cocreation has a positive effect on deployment performance.

However, the involvement of business partners in the development stage is not associated with improved development performance in terms of speed, which is contrary to our expectations. A possible explanation is that new services are often difficult to protect by patents (Tufano, 1989), and accordingly focal service firms may be hesitant to involve business partners (who could also be potential competitors) to a very great extent. As such, business partners are found to have an insignificant effect.

By computing the mean value of partner value cocreation in the development stage and comparing against customer value cocreation (Table II), it shows that customers were involved to a greater extent than business partners (4.709 versus 2.711), which partially supports our explanation.

6.2. Theoretical and managerial implications

The results are consistent with resource dependence theory and provide support to the notion that the roles of customers and partners in NSD are subject to the resource dependency of the focal service firm. This research has implications for the NSD literature. First, it provides empirical support for information from customers as the key resource dependency in the ideation stage of NSD. We found no significant effect of business partner value cocreation on ideation performance, which may indicate that firms do not effectively involve business partners in idea generation, or that information from customers is the key resource dependency (Patrício *et al.*, 2018). Previous studies suggest that customers' key role in innovation is as an information resource (e.g., Nambisan, 2002; Fang, 2008). This empirical study further substantiates that for service innovations, information resource dependency is contingent on the stages of NSD process, and it is only in the ideation stage that customers act as the information resource to cocreate value with the focal service firm. Managerially, the findings suggest that service firms should not just "listen" to customers. Rather, they need to actively involve customers in ideation so that the sticky information (Hippel, 1994) about customer needs and context can be acquired to design innovative new services.

Second, although business partners are also believed to cocreate value with the focal firm by providing their development expertise, the empirical results of this study only support customers in the role of co-developer, which further highlights the necessity of involving customers (especially business customers) in service innovation.

From the results of their study of public service design, Trischler *et al.* (2018) suggest that actively involving customers in service codesign could leverage innovation performance in the form of user benefit and novelty. Our study echoes this conclusion, empirically supporting customers' cocreation role in service codesign. The inseparability characteristic of service requires more intensive interactions with customers, while vulnerability to imitation and dysfunctional competition hinder business partners' value cocreation in the development stage, as they might be potential competitors to the focal service firm.

Third, business partners are found to cocreate value in the deployment stage of the NSD process via joint-investment in capital, which supports the resource dependency involved in launching and deploying new services. Another interesting finding is that although customers were involved to quite a great extent in the deployment stage as well (Mean = 5.153), it did not exhibit a significant impact on deployment performance, which indicates that the key resource needed for deployment is not offered by customers (but business partners), regardless of how they are intensively involved. This research responds to the call for empirical investigation of the deployment of service innovations (Wang *et al.*, 2019) by extending the process view to cover the after-launch deployment stage, and examining value cocreation activities at this stage in particular.

In sum, this research contributes to our understanding of value cocreation processes in service innovation and reveals the effect of each stakeholder's value cocreation on NSD performance. Patrício *et al.* (2018) argue for "the need to develop methods to capture information when value is created" (p. 8) and "to identify, understand, and adopt knowledge about the value creational processes" (p. 9). Taking a process view, this study has used performance indicators for different NSD stages to capture when value is created, and focused on value cocreation with customers and

business partners to understand how external knowledge and resources are adopted in a value creational process.

The findings also have significant managerial implications for helping service firms allocate limited resources more efficiently across the NSD process. In recent years, the development of information and communication technologies has not only enabled companies to develop new services or transform traditional services, but also dramatically changed the way in which value is created, from a value chain paradigm, gradually towards a network paradigm with value created collaboratively. This research suggests that a collaborative value cocreation approach for service innovation, which allows different parties in the business network to contribute their specific resources and knowledge actively across the NSD process, is the most effective. Managers can benefit from a process-based view of resource dependency by identifying the resource needs at different stages of the NSD process and facilitating value cocreation with the parties who possess the needed resources. In the fuzzy front-end stage of ideation, service designers who actively and collaboratively involve customers can show greater novelty and creativity by tapping into information about latent customer needs. Further, in the development stage, incorporating customers' development knowledge and expertise can speed up the development process. After the new service has been developed, service firms with financial resource constraints should involve business partners to co-deploy it effectively so that the market can be quickly occupied ahead of competition.

6.3. Limitations and Future Opportunities

The findings of this research have several limitations that also indicate future research opportunities. First, it used data from IT-related service industries, thus the results of this research are tentative and subject to the characteristics of these industries.

Although these industries are the most prosperous in terms of innovation, these results might not be equally applicable to some traditional service industries with less IT features. Second, our sample is limited to Chinese firms. Thus, caution should be exercised when generalizing our results to other areas beyond China. Third, this research uses cross-sectional data. It would be better to collect longitudinal data to examine whether these findings hold over time. Finally, regarding the unsupported role of business partners in the key development stage of NSD, further efforts should be made to understand how partners can be actively involved when development expertise is highly needed, and how to safeguard the different parties' interests during value cocreation.

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Table I. Construct reliability and validity

Constructs and items	α	CR	Factor loading	AVE
Ideation performance (IP)	0.776	0.854		0.664
IP1. would develop new service(s) to the market			0.947	
IP2. would develop new service(s) of our firm			0.794	
IP3. would develop new service(s) to our existing customers			0.683	
Customer value cocreation in ideation (CVCI)	0.894	0.934		0.824
CVC1. high intensity of customer involvement			0.896	
CVC2. frequent meetings with customers			0.907	
CVC3. the number of customers with whom we interact was high			0.921	
Partner value cocreation in ideation (PVCI)	0.976	0.981		0.946
PVC1. high intensity of business partner involvement			0.989	
PVC2. the frequency of meetings with business partners was high			0.962	
PVC3. low intensity of business partner involvement (reverse coded)			0.966	
Development performance (DVP)	0.812	0.887		0.724

DVP 1. This service was developed faster than major competitors			0.832	
DVP 2. This service was completed in less time than what was considered normal for industry			0.860	
DVP 3. This service was launched ahead of the original schedule			0.861	
Customer value cocreation in development (CVCII)	0.925	0.947		0.817
CVC4. high intensity of customer involvement			0.946	
CVC5. frequent meetings with customers			0.927	
CVC6. the number of customers with whom we interact was high			0.918	
CVC7. collaborated with our customers to integrate their knowledge (on how to develop the new service)			0.820	
Partner value cocreation in development (PVCII)	0.981	0.930		0.771
PVC4. high intensity of business partner involvement			0.885	
PVC5. the frequency of meetings with business partners was high			0.931	
PVC6. collaborated with business partner(s) to integrate their knowledge (on how to develop the new service)			0.923	
PVC7. low intensity of business partner involvement (reverse coded)			0.763	
Deployment performance (DPP)	0.782	0.872		0.694
DPP 1. deployment was faster than originally expected			0.838	
DPP 2. deployment costs were less than expected			0.799	

DPP 3. deployment objectives were met			0.862	
Customer value cocreation in deployment (CVCIII)	0.878	0.917		0.735
CVC8. high intensity of customer involvement			0.875	
CVC9. frequent meetings with customers			0.921	
CVC10. the number of customers with whom we interact was high			0.918	
CVC11. customers would like to introduce the innovation to other customers			0.697	
Partner value cocreation in deployment (PVCIII)	0.980	0.986		0.944
PVC8. high intensity of business partner involvement			0.978	
PVC9. the frequency of meetings with business partners was high			0.979	
PVC10. business partner(s) invested marketing resources jointly with us to deploy the innovation			0.973	
PVC11. business partner(s) were willing to jointly take the market risk			0.957	

Table II. Convergent validity and discriminant validity

	IP	CVCI	PVCI	DVP	CVCII	PVCII	DPP	CVCIII	PVCIII
IP	0.815[a]								
CVCI	0.205[b]	0.908							
PVCI	0.034	0.047	0.973						
DVP	0.232	0.238	0.016	0.851					
CVCII	0.241	0.636	0.048	0.215	0.904				
PVCII	-0.003	-0.047	-0.717	-0.035	-0.081	0.878			
DPP	0.116	0.141	0.124	0.374	0.197	-0.083	0.833		
CVCIII	0.117	0.401	0.009	0.238	0.308	-0.044	0.219	0.857	
PVCIII	0.046	-0.051	0.660	0.107	-0.028	-0.593	0.221	0.115	0.972
Means	5.817	5.010	2.653	4.885	4.709	2.711	4.512	5.153	2.651
Std. Dev.	0.900	1.262	1.922	1.091	1.339	1.898	1.032	1.014	1.830

[a] Squared root of AVE is on the diagonal

[b] Correlation.

Table III. Results of hypotheses testing

Path in the structural model	Path coefficient	Difference (c-p)	Outcome
CVCI → IP (c1) PVCI → IP (p1)	0.204* 0.025 (n.s.)	0.201*	H1: Supported
CVCII → DVP (c2) PVCII → DVP (p2)	0.167* -0.021 (n.s.)	0.190*	H2: Not supported
CVCIII → DPP (c3) PVCIII → DPP (p3)	0.122 (n.s.) 0.172**	-0.046*	H3: Supported
IP → DVP DVP → DPP	0.192* 0.327***		

$^{*}p < .05$, $^{**}p < .01$, $^{***}p < .001$

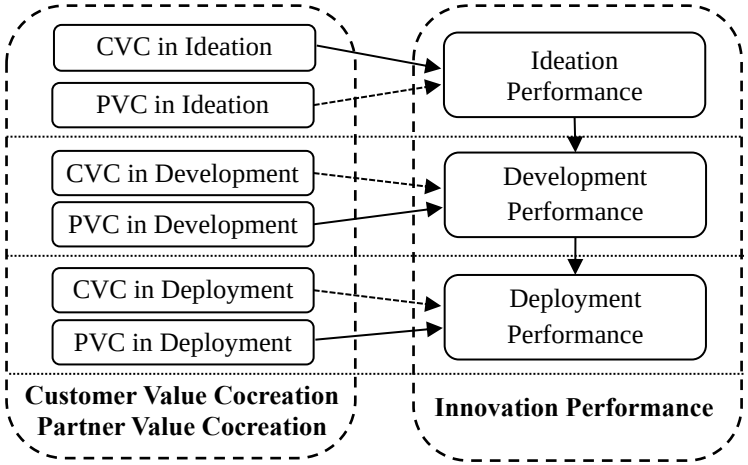

Figure 1. Conceptual model