

# Paradigm of new service development projects (NSDPs): “One Basket Fits all”

New service development projects

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## Abstract

**Purpose** – The aim of this research is to examine the key determinants influencing the success of new service development projects (NSDPs) across four service typologies context.

**Design/methodology/approach** – The researchers used the scenario-based survey method in an NSDP setting. Structural equation modelling (SEM) was used to test the proposed hypotheses based on survey data from 570 managers under four service typologies.

**Findings** – Service firms' cross-functional integration (CFI) and internal project team efficiency (IPTE) positively influenced NSDPs. The results also indicated that both technology infrastructure (TI) and IPTE mediated the relationship between CFI and NSDPs. In addition, the mediation effect of TI existed between the relationship of IPTE and NSDPs. Furthermore, the proposed model confirms that, for NSDPs, the role of knowledge-sharing behaviour (KSB), authentic leadership (AL) and firm's culture (FC) across the four service typologies moderated the relationship.

**Practical implications** – With a better understanding of the dynamics of the aforementioned variables, service managers and the project team can more effectively develop and execute strategies for an NSDP. The article enables practitioners to expand their current understanding of NSDPs by providing insights of the unique antecedents that are significant for new service development across four service types.

**Originality/value** – This research is the first of its kind to examine the mediating role of KSB and TI in determining NSDPs. This study provides one of the first empirical examinations on NSDPs in the context of four service typologies from the perspective of a developing country, where the service industry is competitive. The study demonstrates that the critical success factors of NSDPs do not differ across service types, thereby confirming the “One Basket Fits all” assumption in the current NSDP research study.

**Keywords** New service development project, Cross-functional integration, Internal project team efficiency, Knowledge-sharing behaviour, Authentic leadership, Firm's culture, Technology infrastructure

**Paper type** Research paper

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## Introduction

The literature and empirical investigation on new service development projects (NSDPs) are receiving growing attention from both practitioners and researchers, expanding into many domains and disciplines, whilst researchers are offering new perspectives and tools on various dimensions of NSDP's success (Alam and Perry, 2002; Carbonell and Rodriguez Escudero, 2015; Farashah *et al.*, 2019; de Oliveira and Rabechini, 2019; Garwood and Poole, 2018; Pivec and Maček, 2019). This is timely because there has been a call for research exploring service design priorities and specifically leveraging service design (Liu *et al.*, 2020; Valtakoski *et al.*, 2019). Existing literature offers research focussed on the constructs that improve the practice, discipline and success or failure of a project under a specific context, such as information system, construction, farming, enterprise resource planning (ERP), software, building and disaster management (Costantino *et al.*, 2015; Jiménez-Zarco *et al.*, 2011; Vasudevan *et al.*, 2018); however, further research is still limited, specifically focussed on the new service development process. The extant literature was used to explain the prospects and margins of what is known by identifying, exploring, investigating, observing and exploiting new areas of project success, some of the most fundamental insights remain unexplored with regards to the four service typologies i.e. technology-, contact-, knowledge- and routine-intensive services (Jaakkola *et al.*, 2017). This includes projects that were undertaken by service firms to launch new service offerings to the market. In recent times, the ongoing transformation of service industry structures and the acceleration of innovation and competitive pressures have been observed by service firms (Chu *et al.*, 2019; Martinez *et al.*, 2019; Mao, 2019). The dynamic and diversified competitive market environments, service cost, service quality expectations and leadership in technology-based service may require service enterprises to offer a service towards their target consumers, which needs to develop by means of a successful NSDP process (Edvardsson *et al.*, 2012; Storey *et al.*, 2016; Storey and Hull, 2010).

In the context of a developing country like Bangladesh, service providers are aware that present organizational structures and processes are inadequate to develop and launch services efficiently through appropriate NSDPs. Service firms constantly encounter complexities during the process of implementing new services by the firms as the existing literature does not provide on the critical success factors for NSDPs. Hence, decisions need to be taken for a successful NSDP regarding facilitating the success factors in the earlier phases may have a bigger impact on the NSDP's success compared to the later stages or during the operation of the project. If service managers and their team are not aware of the antecedents that may influence their objectives set from the initial phase, then the project will not be successful. Hence, this study will identify and construct the critical success factors for NSDPs, which will enable the service firms and their relevant stakeholders to evaluate and understand the overall project outcome. Previous studies mentioned that exploration of the factors and establishing the relationships amongst them by considering direct, indirect and external influences allow the firms to implement standard management skills in order to improve the firms' overall project performance (Müller and Jugdev, 2012; Pinto and Slevin, 1988a, b).

Previous researchers identified the NSDP by clustering into four different typologies – routine-, technology-, contact- and knowledge-intensive services – which are also taken into consideration by the current study (Jaakkola *et al.*, 2017; Matzner *et al.*, 2018). The researchers define the first cluster embedded with the service firms featuring with a low degree of technology complexity and contact intensity, such as real-estate service providers, transportation, logistics, maintenance, banking and insurance service firms. The current research study used 140 respondents from this cluster in this study. The second cluster defines the services firms that have the highest degree of technology concentration and complexity combined with a relatively low degree of contact intensity while providing services to the customers. The examples of this category include engineering firms, repair shops, technical support service firms, etc. In total, 120 respondents in this category were used for this study.

The third cluster features high degrees of labour-intensive and higher customer interaction but a low function of technological complexity. The examples of this category include customer care, retail house, healthcare services, hospitality and catering services. In this research, we collected data from 150 respondents in this category. The fourth cluster is embedded with knowledge-intensive services, which highlight both a high degree of complexity and contact intensity during service operations. These include education, legal services, consulting, medical and auditing services, which typically require a high degree of customer involvement and close connection with customers. A total of 160 respondents were taken from this category.

Currently, most tools that depict the success of projects are developed in the field of project management and seem insufficient to fulfil this role in the existing service management literature (Jaakkola *et al.*, 2017; Alam, 2012). In addition, previous studies suggest that a promising way to expand an overall framework for successful projects requires linking the traditional components of project success criteria with the critical success factors that influence the success of a project directly, indirectly and externally (Gardiner and Stewart, 2000). Furthermore, previous researchers, such as Biemans *et al.* (2016); Witell *et al.* (2017) and Jaw *et al.* (2010) only explored and tested specific new service development practices, the nature of service characteristics, innovation and their significance on NSDPs. However, academics and practitioners have not yet constructed and tested a model that provides a generic across the four service typologies in the context of NSDP research. To capture a comprehensive view of the nature of NSDP, a set of common measurable NSDP features were applied in this study in terms of resources (technology infrastructure [TI]), practices (knowledge-sharing behaviour (KSB) amongst the team members, authentic leadership [AL], institutional culture, etc.), methods (project team efficiency, cross-functional integration [CFI]) and results (success of NSDP) (Biemans *et al.*, 2016; Antons and Breidbach, 2018). Therefore, the current research study addresses the existing research gaps and makes the following important contributions to the service development literature. This research focusses on an important aspect of conceptual integration, namely, the success of NSDP and examines the effect of significant antecedents in four different service typologies. This leads the researchers to seek answers of the following broad and specific research questions.

*Broad research question:*

- RQ1.* To what extent do the determinants – CFI, internal project team efficiency (IPTE), technology infrastructure (TI), KSB and AL – influence the success of NSDP amongst four different service typologies?

*Specific research questions:*

- RQ1a.* Does TI mediate the relationship between IPTE and NSDP amongst the four service typologies?
- RQ1b.* Does IPTE mediate the relationship between CFI and NSDP amongst the four service typologies?
- RQ1c.* Do TIs mediate the relationship between CFI and NSDP amongst the four service typologies?
- RQ1d.* To what extent KSB amongst the project team members for service firms moderates the relationship between IPTE and the success of NSDP?
- RQ1e.* To what extent AL style in the NSDP moderates the relationship between CFI and the success of NSDP?

*RQ1f.* To what extent firm's cultures (FCs) for service firms moderate the relationship between CFI and the success of NSDP?

In view of the above-mentioned research questions, the current study also considers the mediation influence of TI between IPTE and the success of NSDPs under four different service typologies. The researchers also simultaneously analyse the moderating effect of KSB between the relationship of IPTE and the success of NSDP. Furthermore, the study incorporates AL and FC variables as moderating influence between CFI and the success of NSDP, which could lead to a reconsideration of the existing literature in which the IPTE, TI, KSB, CFI, AL and FC are considered to be the predominant drivers of the success of NSDP.

The remainder of the manuscript is organized as follows. The next section presents a critical literature review of the key variables to construct the conceptual model. Section 3 presents the methodology by justifying the proposed method and results of an empirical examination of the proposed model in the context of service firms in Bangladesh. Section 4 discusses the significance and implications of the findings. The paper concludes with conclusions, limitations and future directions.

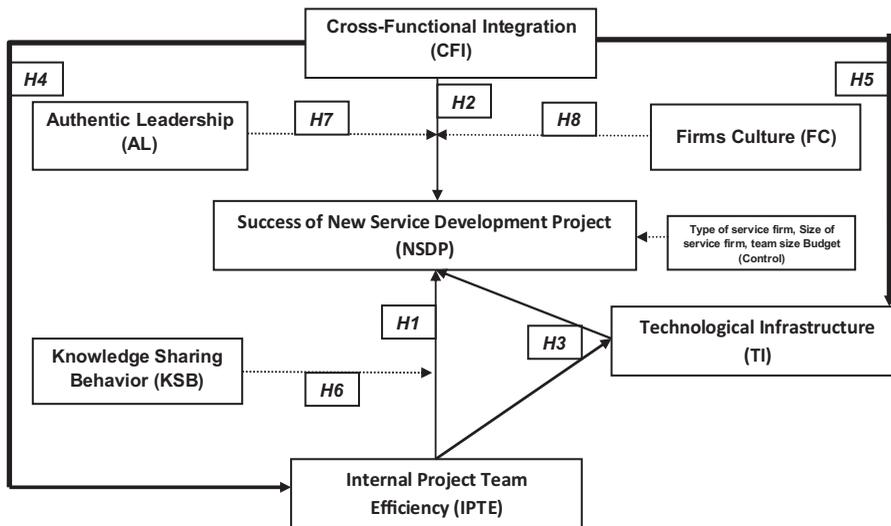
### Conceptual framework and hypotheses development

Existing literature reviews lack in examining the critical success factors of NSDP across the four service typologies. Moreover, research provides different perspectives of firms, employees or consumers which only extend the research width rather than building on existing knowledge depth. For example, Avlonitis *et al.* (2001) linked the service typology with the innovativeness that shapes a new service development, while Kuester *et al.* (2013) explored four service innovation types amongst service firm employees, categorizing them as efficient, innovative, interactive developers and standardized adopters. Cheng *et al.* (2012), on the other hand, explored the consumer aspect of service innovation. They empirically tested service innovation typologies and linked consumer involvement in the various NSDP process stages. Furthermore, Gustafsson *et al.* (2012) and Witell *et al.* (2014) examined how the practices and customers' involvement differ between firms developing incremental and radical innovative services. In sum, as four ranges of typologies for services exist, they have been developed and tested on the basis of theoretical considerations, with the objective of adding value to firms' operations, management and marketing of services.

#### *The relationship between IPTE and the success of NSDP*

The literature on project success argues that IPTE and CFI have a positive relationship with NSDPs (Cooper, 2019; Stähle *et al.*, 2019; Pérez-Luño *et al.*, 2019; Bjorvatn and Wald, 2018; Andriopoulos *et al.*, 2018). The researchers further emphasized that the role of these constructs must be considered for NSDP in the context of wider organizational strategy and the long-term fulfilment of stakeholders' expectation. From the above discussion, it has been argued that both CFI and IPTE are distinct and interrelated concepts that have a positive relationship with NSDPs. Figure 1 presents the conceptual model proposed and tested in this research.

Past research reveals that the influence of project team efficiency significantly influences the success of a project, and the investigations by the previous scholars do not fully relate to the new service development context (Trischler *et al.*, 2018; Chen *et al.*, 2017a, b), as the current research aims to contribute in terms of four service typologies. The idea of "team" efficiency is explained as a small number of individuals with balancing skills who are equally committed to a common purpose, goal and working approach for which the group holds them mutually accountable (Katzenbach and Smith, 2015). The authors also differentiate between "team" and "working group" as they consider that a "team" provides greater performance than a "working group". Particularly, when a firm launches new service, it requires rational



**Note(s):** Line denotes direct effect, Dotted line denotes moderating effect, and bold line denotes mediating effect

**Figure 1.**  
Success factors of new service development project (NSDP)

planning and execution, the team efficiency of the development process has been identified as a critical factor that is used to predict whether or not a new service will be successful in the market (Bstieler, 2005). Wirtz *et al.* (2008) revealed that team efficiency is one of the significant elements of service firms' superior performance.

#### *The relationship between CFI and the success of NSDP*

Again, Sherman *et al.* (2000); Holland *et al.* (2000) and Ernst *et al.* (2010) have made significant contributions concerning project success and the implications of CFI in different sectors. Previous research defines CFI as a behavioural approach by the team members, which captures the high level of communication and information sharing between members from different departments concurrently (Luca and Atuahene-Gima, 2007). Gebauer *et al.* (2008) found that cross-functional teams can combine knowledge and competencies of different perspectives within service organizations contributing to overall effectiveness. The perception of CFI of service firms, especially between management, administration and other departments, such as marketing, finance, production, human resources, research and development (R&D), has been strongly recognized as one of the key factors in the success of NSDP (Alam, 2002; Im and Workman, 2004; Krishnan and Ulrich, 2001). Hence, following hypotheses are derived for further examination:

- H1.* There is a statistically significant and positive relationship between IPTE and the success of NSDP amongst the four service typologies.
- H2.* There is a statistically significant and positive relationship between CFI and the success of NSDP amongst the four service typologies.

The mathematical equation underpinnings of the above-mentioned hypotheses (See Figure 1) are as follows:

$$\text{NSDP} = \gamma_0 + \gamma_1 \text{IPTE} + \gamma_2 \text{CFI} + \zeta_1 \quad (H1, H2)$$

*The mediating role of internal project team efficiency and technology infrastructure*

The competitiveness of service firms is increasingly influenced by their success in new service development (Krishnan and Ulrich, 2001; Cooper and Kleinschmidt, 1995). As the condition of the market has become increasingly competitive due to globalization and the adoption of new technologies by the service firms, it appears strategically important for the service firms to offer new services in a timely manner, which requires a substantial amount of TI (Neirotti and Pesce, 2019). In this study, TI is defined as one of the foundations of the firm's information technology portfolio combined with the technical and human-related assets that are shared throughout the company in the form of consistent cross-functional coordination and project team efficiency that aim at NSDPs' success (Bhatt and Grover, 2005). Thus, the higher levels of firm's TI result in a greater chance of NSDPs' success (Sánchez-Morcilio and Quiles-Torres, 2016).

Previous studies argued that the role of TI in the firm may optimize the team efficiency and CFI by which firms generate and deploy NSDPs (Chen, 2007; Denison et al., 1996; Hoegl and Gemuenden, 2001; Lovelace et al., 2001). When the IPTE is effective, the firm's TI needs to present and mediate the relationship between IPTE and NSDPs' success (Sicotte et al., 2019). Dimitriadis and Stevens (2008) found that management and technology need to be coordinated and aligned with the organization and its strategies for delivering improved service activities. Another study also revealed that firms exhibit greater success in their respective projects when IPTE mediates the relationship between CFI and projects' success (i.e. NSDPs) (Laurent and Leicht, 2019; Pérez-Luño et al., 2019; Ståhle et al., 2019). Again, TI mediates the relationship between CFI and the success of a project (i.e. NSDP) (Tornjanski et al., 2019; Pellathy et al., 2019; Daniel Sherman et al., 2005). Thus, following hypotheses are derived:

- H3. TI mediates the relationship between IPTE and NSDP amongst the four service typologies.
- H4. IPTE mediates the relationship between CFI and NSDP amongst the four service typologies.
- H5. TI mediates the relationship between CFI and NSDP amongst the four service typologies.

The following mathematical equations derived from the above hypotheses (See Figure 1) are highlighted as follows:

$$\text{TI} = \gamma_3 \text{IPTE} + \zeta_2, \text{NSDP} = \beta_1 \text{TI} + \gamma_3 \text{IPTE} + \zeta_3 \quad (H3)$$

$$\text{IPTE} = \gamma_4 \text{CFI} + \zeta_4, \text{NSDP} = \beta_2 \text{IPTE} + \gamma_4 \text{CFI} + \zeta_4 \quad (H4)$$

$$\text{TI} = \gamma_5 \text{CFI} + \zeta_5, \text{NSDP} = \beta_2 \text{TI} + \gamma_5 \text{CFI} + \zeta_5 \quad (H5)$$

*The moderating role of knowledge-sharing behaviour, authentic leadership and firm's culture*

KSB amongst the team members is a part of knowledge management that has been receiving a great deal of interest by managers and academics to investigate the process of managing the dynamics of group knowledge sharing, such as producing, capturing, storing, sharing and implementing knowledge amongst the team members in order to improve team efficiency (Madhavan and Grover, 1998; Lawson et al., 2009; Kremer et al., 2019; Duong and Swierczek, 2019). Within the above-mentioned parameters, KSB is crucial for a group to perform in an

efficient way for a successful NSDP (Ouriques *et al.*, 2019; Hoegl *et al.*, 2003). Limited research evidence exists to support the moderating effects of KSB on the success of NSDP. However, project management studies provide some empirical support for the effects of KSB on the success of NSDP. For instance, Madhavan and Grover (1998) found that a higher level of KSB amongst the project team will enhance the relationship between team efficiency and new product development. In addition, KSB is beneficial for NSDP because (1) KSB allows the project team to have a resourceful knowledge repository that ultimately pushes them to be more efficient and effective for the successful completion of NSDP; (2) KSB allows the team to directly find the needed knowledge and thus helps the team's overall efficiency; (3) KSB makes all the members more likely to accept the new knowledge from others (Lee *et al.*, 2015; Chen *et al.*, 2017a, b). Hence, it can be hypothesized that

*H6.* The positive relationship between IPTE and the success of NSDP will be stronger when KSB amongst the project team members for service firms moderates the relationship.

Based on the above hypothesis, the following mathematical equation is proposed:

$$\text{NSDP} = \gamma_6 \text{IPTE} + \gamma_7 \text{IPTE} * \text{KSB} + \zeta_6 \quad (H6)$$

Project leadership requires a new dimension by using authentic style of leadership in order to adapt and meet the changing needs of the relevant stakeholders for 21st century products or service-intensive industry. In considering the relevance of leadership, a number of researchers explain its significance, while others have given considerable attention to AL style (Sok *et al.*, 2018; Lloyd-Walker and Walker, 2011; Yang *et al.*, 2011). There has been little empirical research on the moderating role of AL on the relationship between CFI and the success of NSDP (Zhu *et al.*, 2019; Khan *et al.*, 2014). The research study that has already been done indicates quite strongly that AL operates indirectly as an enabler of the project process by optimizing CFI (Oh *et al.*, 2019; Toor *et al.*, 2007). For example, the leadership role provided by the NSDP leaders helps the cross-functional team members to participate in developing the NSDP in line with the stakeholder's expectations. Therefore, combining CFI and AL in the context of new service development enhances the success of NSDP and thus, the cost of service development may reduce and promote the service firm's performance. Hence, when the degree of AL for NSDP projects is high, CFI in new service development strengthens the capability of service firms, thereby improving their overall project performance and further reducing costs. In other words, AL in the context of new service development strengthens the positive impact of CFI on NSDPs' performance (Florin and Cuganesan, 2019; Zhu *et al.*, 2019; Swain *et al.*, 2018).

*H7.* The positive relationship between CFI and the success of NSDP will be stronger when AL style in the NSDP moderates the relationship.

Thus, the study applies the following equation to test the moderation effect of AL:

$$\text{NSDP} = \gamma_7 \text{CFI} + \gamma_8 \text{CFI} * \text{AL} + \zeta_9 \quad (H7)$$

Again, a FC is one of the fundamental elements that foster overall integration of the functional team and project success on time. By considering this versatile element amongst the different types of industry, researchers have argued that the contribution of culture in projects' success is positive (Patterson *et al.*, 2005; Ajmal and Koskinen, 2008; Wei and Miraglia, 2017; Teller, 2013). When the FC is strong, a cross-functional team plays an important role in strengthening the project's success (Van Poucke *et al.*, 2018; Mueller, 2014, 2015; Hoda and Murugesan, 2016). A FC combines with the practices, symbols, values and assumptions that the members of the firm share with regard to reaching the objective through appropriate behaviour (Patterson *et al.*, 2005; Schneider *et al.*, 2013). FC provides a direction concerning

norms that stabilizes the methods of operation. Thus, project managers need to merge different organizational and professional cultures into one project culture that produce a successful NSDP (Ajmal and Koskinen, 2008).

Previous researchers argue that FC serves as the foundation for management systems and practices, such as CFI (Kuo and Tsai, 2019; Bridges, 2018). Hence, the cultural traits of the organization set a high-level of social interaction amongst the team members that produces new knowledge that is legitimate and shared (Karlsen and Gottschalk, 2004). Considering the context, the novelty of FC in the success of NSDPs, service firms are unlikely to depend on new solutions, which, however, assist the service firms to apply a uniform standard of cultural norms across the team in order to optimize the speed of NSDP. Specifically, FC for service firms intensifies the positive impact of CFI on NSDPs. Thus, it can be hypothesized that

*H8.* The positive relationship between CFI and the success of NSDP will be stronger when FC for service firms moderates the relationship.

Based on the above hypothesis, the following mathematical equation is proposed:

$$\text{NSDP} = \gamma_{10}\text{CFI} + \gamma_{11}\text{CFI*FC} + \zeta_{12} \quad (H8)$$

Figure 1 summarizes the hypotheses of this study in a conceptual model based on the above-mentioned conceptual and theoretical foundation. Based on that H1–H8 are proposed for further empirical examination, as shown in Figure 1. The study used all the variables in the unobservable form, and each construct was formed by the indicator (as observable variable) using a first-order analysis by operationalizing reflective indicators (there are common factors within the indicators in each variable). This research involved 56 items representing the seven variables of this research.

## Methodology

### *Sample and procedure*

The researchers appointed well-trained graduate research assistants from different marketing specialization courses under Master of Business Administration (MBA) and Executive Master of Business Administration (EMBA) programmes at a large private university in Bangladesh to assist in collecting the responses. The respondents were selected from the mid-level and senior executives who had different experience in terms of the NSDP initiated by their respective service firm, such as banks, restaurants, hotels, information technology (IT) firms, education and consultancy. In addition, the graduate research assistants in this project also applied the chain referral sampling method adopted from Harun *et al.* (2018) and Balaji *et al.* (2017), where the research assistants contacted several respondents (managers of service firms) to complete the survey. The data were collected between August 2018 and March 2019 from the executives, by the students of MBA or EMBA programmes by the classroom intercept and referral method using the executive workplace intercepts method. In total, the researchers collected 660 responses. Out of 660 instruments, only 570 instruments were fully completed by the respondents. Therefore, the researchers obtained an 83% response rate from this survey. A total of 570 useable responses were obtained where the researchers collected cluster 1 routine-intensive services: 140 responses, cluster 2 technology-intensive services: 120 responses, cluster 3 contact-intensive services: 150 responses and cluster 4 knowledge-intensive services: 160 responses from the four different service typologies. The majority of respondents (60%) were aged between 30 and 40 years. The overall sample consisted of 56% male respondents and 44% female respondents.

The researchers operationalized a scenario-based survey to obtain quality and in-depth responses from the study’s participants. The respondents were instructed to go through a successful service project scenario developed by the researchers in line with the theoretical framework and requested to respond to statements under each relationship of NSDPs. The project scenario was revised and improved through repeated review by three researchers in association with four academic experts and four project managers under each service typology to assess the clarity of meaning and correct understanding. The researchers applied the scenario-based survey as previous researchers explained that this approach has numerous advantages over the traditional survey method. These include creating a rational and realistic situation for the respondents, eliminating the difficulty in noticing the common success factors of NSDPs, minimizing the memory bias and overcoming the ethical issues that concern the respondents and their recalling of experiences (Andreassen and Streukens, 2012; Dabholkar and Spaid, 2012). The following NSDP scenario was used to obtain responses from the managers of the service firms:

Imagine the following circumstances. You have been nominated by your company to be one of the team members for launching a new service offering to your target customers. This is your first time you are in such a team. You were chosen for this team because the firm understands that you have all the qualities that fit you in this position, such as efficiency, knowledge sharing behaviour, and a strong connection with the company. In addition, you also believe that to launch a successful project other important criteria are also significant for your team, such as cross-functional integration, favourable IT infrastructure, leadership, and total team efficiency.

In addition, the researchers also conducted a pre-test of survey instrument of 50 service employees to ensure that the items reflect a true critical success factor of NSDPs. The study analysed the data extracted from the pilot survey to check the internal consistency and relevant factor structure to verify and purify the construct items, so that the final survey data would be fit for the research context and confirm the reliability and validity with more clarity (Flynn *et al.*, 1990) (see Table 1).

Sample size ( <i>n</i> = 570)	Cluster 1 = ( <i>n</i> = 140)	Cluster 2 = ( <i>n</i> = 120)	Cluster 3 = ( <i>n</i> = 150)	Cluster 4 = ( <i>n</i> = 160)
<i>Gender</i>				
Male (56%)	60%	65%	56%	40%
Female (44%)	40%	25%	44%	60%
<i>Type of service</i>	Housing = 20%	Engineering = 60%	Customer care = 40%	Legal services = 10%
	Banking = 35%	Repair = 15%	Healthcare services = 30%	Business consulting = 40%
	Insurance = 35%	Technical support = 20%	Hospitality = 10%	Design services = 40%
	Transportation = 10%	IT services = 5%	Catering = 20%	Auditing services = 10%
<i>No. of services developed (each year)</i>	3 and above	Between 1 and 2	3 and above	3 and above
How realistic is the scenario described in the questionnaire?	Mean = 4.45	Mean = 4.75	Mean = 4.35	Mean = 4.65
The scenario described is easy to comprehend	Mean = 4.48	Mean = 4.79	Mean = 4.40	Mean = 4.75

**Table 1.** Sample characteristics and realism of the scenario

*Operationalization of the variables*

The adapted scales used to measure the constructs of this research were developed from previous research and are highlighted in Table 2. In order to assess CFI, respondents assessed their level of integration with other departments towards projects' success. Hence, CFI was measured using a ten-item Likert scale adapted from Sherman *et al.* (2000); Holland *et al.* (2000) and Ernst *et al.* (2010). Amongst the ten items, one item was developed in the reverse context (CFI10). To assess IPTE and TI, participants responded to the items adapted from Bstieler (2005) and Chen (2007). These scales consisted of ten items for assessing IPTE and ten items for assessing the service firm's TI. The researchers measured KSB using ten items adapted from Navimipour and Charband (2016); Kanawattanachai and Yoo (2002); Lewis (2003), and Scott and Tiessen (1999); KSB5 was structured in the reverse form. AL was measured on a ten-item Likert scale adapted from Lloyd-Walker and Walker (2011) and Toor *et al.* (2007). The measurement of FC used 16 items adapted from Patterson *et al.* (2005); Wei and Miraglia (2017) and Ajmal and Koskinen (2008). In addition, in this construct, FC7 was developed in the reverse form for the respondents. Finally, the NSDP was measured using nine items adapted from Cooper and Kleinschmidt (1988); Cooper and Kleinschmidt (1995) and Ernst *et al.* (2010). The Likert-type scales were measured on a five-point scale anchored by "1" strongly disagree and "5" strongly agree. The realism of the scenario was measured with a single item, "how realistic is the scenario described in the questionnaire?" (1 = very unrealistic and 5 = very realistic). Comprehension of the scenario was measured with the item, "the scenario described is easy to comprehend" (1 = strongly disagree and 5 = strongly agree).

The current research study included multiple control variables, such as types of service firm, size of service firm and new service development budget. By including the type and size of service firm as an overall control variable, the study is capable of adjusting for any significant differences that may exist between the different typologies of the service clusters with regard to new service development success. In addition, the researchers also included project budget allocation and team size as overall control variables for this study. The size of a project team and allocation of budget for new service development are potential influencers of the quality of performance by the project team and management; individual team member support has a positive influence on the success of NSDP (Henard and Szymanski, 2001).

*Common method variance (CMV)*

The researchers managed and settled the common method variance (CMV) effect in the research design and data analysis stages by using the suggested guidelines by Podsakoff *et al.* (2003) and Serrano Archimi *et al.* (2018). In the research design stage, the project scenario and the survey instrument were reviewed by academic experts, service employees and NSDP managers. The survey items were also reversed coded by asking the respondents one negative statement under each construct in the survey questionnaire. The respondents were assured of anonymity. The researchers also emphasized that there were no right or wrong answers and asked the respondents to answer the survey questions as correctly as possible.

In the statistical stage, the researchers ran Harman's one-factor test by applying an exploratory factor analysis with an unrotated factor solution for each data set (cluster 1 routine-intensive services: 140 responses, cluster 2 technology-intensive services: 120 responses, cluster 3 contact-intensive services: 150 responses and cluster 4 knowledge-intensive services: 160 responses). The test results revealed that the explained variance of each cluster of data was not above 29.68%, which confirms the threshold of 50% suggested by Podsakoff *et al.* (2003). In addition, the researchers also ran Harman's single-factor test using a confirmatory factor analysis (CFA). Malhotra *et al.* (2006, p. 1867) mentioned that "method biases are assumed to be substantial if the hypothesized model fits the data". Our

Constructs	Items
<p><i>Cross-functional integration (CFI)</i>            In the success of NSDP X, I as a team member (e.g. respondent from sales unit) integrated with (e.g. R&amp;D, finance, marketing, HR and production) during the following NSD activities . . .</p>	<p><i>CFI1:</i> CFI requires to plan and formulate new service development objectives  <i>CFI2:</i> High level of information flow required between all the operational units of the service firms  <i>CFI3:</i> Cross-functional participation needed to identify specific problems that are a barrier to the success of the new service development project  <i>CFI4:</i> It is critical to explain the determination of the overall strategy across the departments before introducing the new service into the market.  <i>CFI5:</i> The team measures the execution of test-marketing assessment cross functionally before market introduction of the new service  <i>CFI6:</i> CFI is required to monitor competitors' reactions and their strategies  <i>CFI7:</i> Unhealthy behaviour, such as distortion and withholding of information, always hurts decisions and creates distrust during interaction, and obstacles in the decision process of NSD (<i>reverse question</i>)</p>
<p><i>Internal project team efficiency (IPTE)</i>            In the NSD project X, I (e.g. respondent from sales) need overall team efficiency in the following activities . . .</p>	<p><i>IPTE1:</i> The team should have the capability to reach the project objectives  <i>IPTE2:</i> Meeting schedule amongst the project team executed on time  <i>IPTE3:</i> The team promptly understands the market trend  <i>IPTE4:</i> The team promptly executes the market trend  <i>IPTE5:</i> The team is capable in terms of technical activities  <i>IPTE6:</i> The team is proficient to easily forecast the unpredictable market that is hard to anticipate  <i>IPTE7:</i> The team should not carry the project from beginning to end (<i>reverse question</i>)</p>
<p><i>Technology infrastructure (TI)</i>            In the NSD project X, I need overall IT infrastructure in the following activities . . .</p>	<p><i>TI1:</i> The firm's current IT, which facilitates and showcases the services innovation database, is available to the project team  <i>TI2:</i> <i>The firm's current IT facilitates a competitive advantage over its competitors in NSD</i>  <i>TI3:</i> The firm's current IT infrastructure improves the CFI and decision-making process  <i>TI4:</i> The current IT addresses the specific control requirements of the team for higher efficiency in NSD  <i>TI5:</i> The current IT improves our NSD project's strategic planning process  <i>TI6:</i> The current IT helps to make a pre-emptive strike against competitors in NSD  <i>TI7:</i> The current IT helps provide minimum administrative support for the project team (<i>such as billing, collection, inventory management</i>) (<i>reverse question</i>)</p>

(continued)

**Table 2.** Operationalization of variables

Constructs	Items
<p><i>Knowledge-sharing behaviour (KSB)</i> In the NSD project X, I (e.g. respondent from sales) need overall KSB in the following activities . . .</p>	<p><i>KSB1:</i> The NSD project team members clearly have the knowledge that they need to share and which can guide them in doing the prescribed job  <i>KSB2:</i> To do our work in NSD, we actually rely on standard procedures and practices to share knowledge  <i>KSB3:</i> Team efficiency will be maximized through KSB amongst the team members, which has an essential role in leveraging the team resources  <i>KSB4:</i> Team members share their knowledge when they trust their partners  <i>KSB5:</i> Team neglect knowledge sharing between their project teams (<i>reverse question</i>)  <i>KSB6:</i> Sharing knowledge and experience may reduce the costs associated with the NSD project  <i>KSB7:</i> Explicit knowledge (i.e. data, information, documents, records, files, etc.) promotes knowledge sharing behaviour amongst the project team  <i>KSB8:</i> Tacit knowledge (i.e. experience, thinking, competence, commitment, deeds, etc.) is also required to promote KSB amongst the project team</p>
<p><i>Authentic leadership (AL)</i> In the NSD project X, I (e.g. respondent from sales) expect my team leaders in the following role . . .</p>	<p><i>AL1:</i> AL is those who are confident, hopeful, optimistic, resilient and of high moral character towards achieving the success of the NSD project  <i>AL2:</i> My project leader is true to himself/ herself (rather than conforming to the expectations of others)  <i>AL3:</i> My project leader is motivated by personal convictions rather than to attain status, honours, or other personal benefits  <i>AL4:</i> My project leader is original in the sense of not copying, that is, he/she leads from his/her own personal point of view  <i>AL5:</i> My project leader takes pleasure in empowering others rather than concentrating power around him/ her  <i>AL6:</i> My project leader is guided by qualities of the heart and mind together  <i>AL7:</i> My project leader has emotional intelligence competency  <i>AL8:</i> My project leader maintains a relationship amongst the cross-functional team that is unfair and biased (<i>reverse question</i>)</p>

Table 2.

(continued)

Constructs	Items
<p><i>Firm's culture (FC)</i> In the NSD project X, I (e.g. respondent from sales) expect my service firm in the following context . . .</p>	<p><i>FC1:</i> Management in my service firms let employees make their own decisions  <i>FC2:</i> Management trust employees to take NSD-related decisions without getting permission first  <i>FC3:</i> Collaboration between departments in my service firm is very effective  <i>FC4:</i> Supervisors in my project are friendly and easy to approach  <i>FC5:</i> My service firm pays little attention to the interests of employees (<i>reverse question</i>)  <i>FC6:</i> In my service firm, it is considered to be essential to follow the rules  <i>FC7:</i> My service firm is quick to respond when changes need to be made in the market  <i>FC8:</i> In my firm, objectives are modified in light of the changing circumstances of the service industry  <i>FC9:</i> Employees here always want to perform to the best of their ability due to motivation by the firm  <i>FC10:</i> Employees usually receive feedback on the quality of work they have done on the NSD project  <i>FC11:</i> The future direction of the company NSD is clearly communicated to the stakeholders</p>
<p><i>New service development project (NSDP)</i> To what extent do you agree with the following statements related to the success of the new service (project X)</p>	<p><i>NSDP1:</i> How successful was this new service development from the context of firm's overall profitability standpoint? (1 = "a great financial failure" and 5 = "a great financial success")  <i>NSDP2:</i> Relative to your service firm's other new services, how successful was this new service in terms of profits? (1 = "far less than our other new services" and 5 = "far greater than our other new services")  <i>NSDP3:</i> Relative to your service firm's objectives, how successful was this new service in terms of profits? (1 = "far less than our objectives" and 5 = "far exceeded our objectives")  <i>NSDP4:</i> Relative to your service firm, the current new service exceeded sales expectations (1 = "far less than our expectations" and 5 = "far exceeded our expectations")  <i>NSDP5:</i> Relative to your service firm, the current new service exceeded the return on investment (ROI) expectations (1 = "far less than our expectations" and 5 = "far exceeded our expectations")  <i>NSDP6:</i> Relative to your service firm, the current new service exceeded senior management's expectations (1 = "far less than our expectations" and 5 = "far exceeded our expectations")  <i>NSDP7:</i> Relative to your service firm, the current new service exceeded customer expectations (1 = "far less than our expectations" and 5 = "far exceeded our expectations")  <i>NSDP8:</i> Relative to your service firm, the current new service exceeded the specialized knowledge of several different team members, which was needed to complete the project deliverables (1 = "Strongly Disagree" and 5 = "Strongly Agree")</p>

Table 2.

Harman's single-factor model under each cluster of data shows a poor fit (GFI = 0.684; AGFI = 0.628; NFI = 0.617; IFI = 0.684; TLI = 0.642; RMR = 0.123 and RMSEA = 0.123), which supports the non-existence of CMV in our data set. To end, the study also used a common latent factor (CLF) test for each cluster, and the researchers assessed and compared the standardized regression weights of all the items for the models with and without CLF. The results revealed that regression weights under each item were found to be very small (<0.200), which confirmed that CMV is not a major issue for each cluster of data (Gaski, 2017; Siyal *et al.*, 2019). These results indicate that CMV is not a major concern in this study.

#### *Data analysis method*

The study applied the CFA along with the structural equation modelling (SEM) technique using AMOS software. The current study adapted the two-stage data analysis procedure suggested by Anderson and Gerbing (1998). In the first stage, the measurement model was used to assess the reliability and validity of the adapted scales under each construct. In the second stage, the structural model was used to test the hypotheses proposed through the SEM technique. The researchers used SEM as the method has a combination of the exploratory factor analysis and multiple regressions (Ullman and Bentler, 2003). Turning to the mediation effect analysis, the researchers calculated the effect of the intervening variable, such as TI and IPTE. The current research study used the indirect effect method, which very much suits the SEM technique that was adopted in the data analysis (Baron and Kenny, 1986; Hayes, 2013). The study used standardized regression weights, *p*-value, the regression weights and the direct and indirect effects of the above-mentioned variables. Through these values, the study compared between the direct effect and the indirect effect via the changes of  $\beta$  values in the two scenarios (i.e. in existence of the mediator and without mediator) to examine the mediating effect of TI on the relationship between IPTE and the success of NSDP, IPTE on the relationship between CFI and the success of NSDP and TI on the relationship between CFI and NSDPs. Furthermore, for testing the moderating effect of KSB, AL and FC, the study used the interaction effect between the independent variables and the moderating variable on the dependent variables (Hakim and Fernandes, 2017; Famiyeh *et al.*, 2018).

## **Results**

### *Measurement model*

The current research study adapted the logic of Anderson and Gerbing (1998) in conducting the CFA (Table 3) to establish the construct reliability and discriminant validity of the multi-item scales adapted in this research. The researchers confirmed that the chi-square value for this model was significant  $\{X^2 = 1049.826$ , with 389 degrees of freedom (df),  $p = 0.000\}$ . In addition, by considering the sensitivity of the sample size and complexity of the model, the researchers analysed the value of the goodness-of-fit index (GFI), Tucker–Lewis index (TLI), standardized root-mean-square residual (SRMR), root-mean-squared error of approximation (RMSEA) and the comparative fit index (CFI) to assess the model fit (Bagozzi and Yi, 1988). The results revealed that all the corresponding values of the CFA model appear to be in line or above the threshold that justifies the CFA analysis by using the constructs to indicate satisfactory model fit (GFI = 0.912, AGFI = 0.890, TLI 0.967, CFI = 0.973, SRMR = 0.028 and RMSEA = 0.047).

In addition, all the individual constructs, i.e. CFI, IPTE, TI, KSB, FC, AL and NSDP, exceed the recommended standards proposed by Bagozzi and Yi (1988) in terms of construct reliability (>0.80) and the average variance extracted (AVE) by the latent construct (>0.50). Furthermore, all item loadings had a significant *t*-value, thereby confirming convergent

Construct/items	Unstandardized loading*	Construct reliability	AVE	Cronbach's alpha
<i>Cross- functional integration (CFI)</i>		0.88	0.53	0.88
CFI1	0.70			
CFI2	0.75			
CFI3	0.77			
CFI4	0.78			
CFI5	0.79			
CFI6	0.67			
CFI7	0.64			
<i>Internal project team efficiency (IPTE)</i>		0.89	0.51	0.89
IPTE1	0.79			
IPTE2	0.77			
IPTE3	0.78			
IPTE4	0.67			
IPTE5	0.75			
IPTE6	0.71			
IPTE7	0.65			
<i>Technology infrastructure (TI)</i>		0.87	0.54	0.86
TI1	0.75			
TI2	0.73			
TI3	0.76			
TI4	0.74			
TI5	0.61			
TI6	0.84			
TI7	0.68			
<i>Knowledge- sharing behavior (KSB)</i>		0.93	0.53	0.92
KSB1	0.76			
KSB2	0.79			
KSB3	0.76			
KSB4	0.61			
KSB5	0.65			
KSB6	0.63			
KSB7	0.81			
KSB8	0.79			
<i>Authentic leadership (AL)</i>		0.94	0.57	0.93
AL1	0.79			
AL2	0.76			
AL3	0.81			
AL4	0.82			
AL5	0.84			
AL6	0.61			
AL7	0.75			
AL8	0.63			
<i>Firm's culture (FC)</i>		0.88	0.58	0.87
FC1	0.62			
FC2	0.73			
FC3	0.71			
FC4	0.79			
FC5	0.54			
FC6	0.82			
FC7	0.67			
FC8	0.69			
FC9	0.79			
FC10	0.76			
FC11	0.81			

(continued)

**Table 3.**  
Confirmatory factor  
analysis results

Construct/items	Unstandardized loading*	Construct reliability	AVE	Cronbach's alpha
<i>New service development project (NSDP)</i>		0.95	0.61	0.94
NSDP1	0.86			
NSDP2	0.81			
NSDP3	0.76			
NSDP4	0.73			
NSDP5	0.81			
NSDP6	0.72			
NSDP7	0.73			
NSDP8	0.82			

**Note(s):** Average variance extracted (AVE); Cross-functional integration (CFI); Internal project team efficiency (IPTE); Technology infrastructure (TI); Knowledge-sharing behaviour (KSB); Authentic leadership (AL); Firm's culture (FC); New service development project (NSDP). \*All parameter estimates are significant at the 0.001 level

Table 3.

validity. In addition, the AVE for each construct was greater than 0.5, further supporting the convergent validity of the measures (Fornell and Larcker, 1981). Meanwhile, the individual constructs' construct reliability and Cronbach's alphas indicate satisfactory reliability of the constructs recommended by Hair *et al.* (2010). The result of the squared root of AVEs of each construct was greater than the correlation it contributes to other constructs, which supports the measurement model and also confirmed discriminant validity (Fornell and Larcker, 1981).

#### *The invariance analysis*

The researchers performed the invariance analysis in order to meet the four service typologies uniformity of measures by the proposed model before hypotheses testing (Steenkamp and Baumgartner, 1998; Park *et al.*, 2015). The researchers conducted the configural invariance test to determine whether service typology 1: technology-intensive services (cluster 1), service typology 2: contact-intensive services (cluster 2), service typology 3: knowledge-intensive services (cluster 3) and service typology 4: routine-intensive services (cluster 4) would use the same pattern in measuring the items adapted in this study under each construct. The results of the configural invariance analysis and metric invariance, as shown in Table 4, indicate that the  $\chi^2$  and model-fit indicators for each group are sufficient to support the configural invariance analysis of the construct. Finally, a partial metric invariance model with six of 56 invariance constraints relaxed was supported (Table 4).

#### *Structural model*

The results from the structural equation model indicate that the overall model provides a substantial fit with the data, in that all the recognized fit indices are acceptable ( $\chi^2 = 723.86$ ;  $df = 387$ ;  $\chi^2/df = 1.87$ ; CFI = 0.967; IFI = 0.968; TLI = 0.960; RMSEA = 0.054). The results of the path coefficients of the structural model, highlighted in Table 5, indicate that all seven paths in the proposed structural model were significant and positive towards their respective endogenous variables. CFI was found to have a positive and significant influence on NSDP ( $\beta = 0.45$ ,  $t = 4.88$ ,  $p < 0.01$ ). In addition, IPTE also proved positive and significant towards NSDP ( $\beta = 0.56$ ,  $t = 6.24$ ,  $p < 0.01$ ). Therefore, the results provide empirical support for H1 and H2 and that both CFI and IPTE have a positive and significant relationship with the service firm's NSDP. Furthermore, CFI has significant positive influence on IPTE ( $\beta = 0.56$ ,  $t = 6.24$ ,  $p < 0.01$ ) and a positive effect on TI ( $\beta = 0.34$ ,  $t = 3.77$ ,  $p < 0.01$ ). Regarding the effects of IPTE towards TI, the relationship also proved significant and positive ( $\beta = 0.37$ ,  $t = 3.88$ ,  $p < 0.03$ ). Finally, TI has a direct positive influence on NSDP ( $\beta = 0.42$ ,  $t = 4.58$ ,  $p < 0.01$ ).

Name	$\chi^2$	df	IFI	TLI	CFI	RMSEA
Cluster 1	302.68	97.25	0.954	0.960	0.972	0.056
Cluster 2	209.76	97.25	0.953	0.961	0.973	0.051
Cluster 3	276.39	97.25	0.955	0.962	0.974	0.042
Cluster 4	289.14	97.25	0.956	0.963	0.971	0.051
Stacked model	1,079.086	389	0.957	0.970	0.973	0.047

Test for metric invariance	$\chi^2$	df	TLI	CFI	RMSEA
Non-restricted model	1,079.086	389	0.970	0.973	0.047
Full-metric invariance <sup>a</sup>	1,107.056	403	0.970	0.952	0.047
Partial-metric invariance <sup>b</sup>	1,087.069	398	0.980	0.978	0.045

**Note(s):** <sup>a</sup>full-metric invariance is not supported ( $\chi^2_{df}(56)$ ). <sup>b</sup>Partial-metric invariance is supported ( $\chi^2_{df}(50)$ ) (with six items of 56 invariance constraints relaxed)

**Table 4.** Results of configural and metric invariance of the clusters

Relationships	Estimate	<i>t</i>	<i>p</i> -value	Conclusion
CFI → NSDP	0.45	4.88	<0.01	Linear relationship
IPTE → NSDP	0.56	6.24	<0.02	Linear relationship
CFI → IPTE	0.26	3.24	<0.01	Linear relationship
CFI → TI	0.34	3.77	<0.01	Linear relationship
IPTE → TI	0.37	3.88	<0.03	Linear relationship
TI → NSDP	0.42	4.58	<0.01	Linear relationship

**Note(s):** Cross-functional integration (CFI); Internal project team efficiency (IPTE); Technology infrastructure (TI); Knowledge-sharing behaviour (KSB); Authentic leadership (AL); Firm's culture (FC); New service development project (NSDP)

\*All estimates are significant at the <0.05 level

**Table 5.** The results of SEM and its respective path co-efficient

*Mediating effect of technology infrastructure and internal project team efficiency*

The study adapted the recommendations of Preacher and Hayes (2008) and Balaji et al. (2017) to test the mediation effects, which was run with 5,000 bootstrapping re-samples and a bias-corrected 95% confidence interval. If the confidence interval contains no zeros, then the indirect influence is considered to be non-significant. From the bootstrapping procedure, the results from the data revealed that the mediating effects of TI and IPTE had a significant total effect on NSDP ( $\beta = 0.36, t = 5.76, p < 0.01$ ). When, we bring in TI as a mediator, the direct effect of IPTE on the success of NSDP reduces ( $\beta = 0.31, t = 4.66, p < 0.01$ ), while the indirect effect of IPTE on NSDP via service firm's TI reaches a point of estimate on 0.05. Thus, the confidence interval at 95% contains no zeros (Lower 95% confidence interval = 0.05; upper 95% confidence interval = 0.01) and the indirect effect is significant. Therefore, we can confirm that TI mediates the relationship between IPTE and NSDP, thus supporting H3.

The research study also supported H4 as the indirect effect of CFI on the success of NSDP via IPTE had a point of estimate of 0.07 (total effect:  $\beta = 0.26, t = 4.76, p < 0.01$ ; after introducing the mediating effect of IPTE:  $\beta = 0.19, t = 3.56, p < 0.01$ ) with the no zeros bias-corrected 95% confidence interval: the lower 95% confidence interval = 0.04 and upper 95% confidence interval = 0.01. Thus, IPTE was proven to mediate the influence of CFI on the success of NSDP amongst the four service typologies. Therefore, we also accepted hypothesis 4 (H4).

Finally, for the mediating effect of TI, the results from the analysis indicated that the point of estimates for the indirect effect of CFI on NSDP is 0.08 (total effect:  $\beta = 0.22, t = 5.76, p < 0.01$ ; after introducing the mediating effect of TI:  $\beta = 0.14, t = 4.56, p < 0.01$ ). As the bias-corrected 95% confidence interval also provided no zeros (lower 95% confidence interval = 0.04; upper 95% confidence interval = 0.01), **H5** is supported by the results. Hence, the research study also confirmed that TI mediates the relationship between CFI and NSDP amongst the four service typologies.

*Moderation analysis*

The research study applied the interaction effect analysis in order to test the moderating effect between the independent variables and the moderating variable (Fairchild and MacKinnon, 2009). The following test results of the moderating effect are presented:

*Moderating effect of knowledge-sharing behaviour on internal project team efficiency on NSDP*

The result from the SEM analysis revealed an interaction coefficient ( $\beta$ ) of 0.262, with a significant *p*-value, thereby proving that project team’s KSB as acts as a moderator between project team efficiency and the success of an NSDP. The direct effect of IPTE on the NSDP has no significant influence when the KSB variable is a strong moderator between the relationships. The results also reflect that the value of the coefficient of the interaction effect is positive and hence, the effect of the variable KSB is said to be strengthening. From the slope analysis, the researchers found that the higher the influence of KSB impact, the greater the effect of IPTE on the service firm’s NSDP. Thus, the outcome from this research accepted hypothesis 6 (**H6**).

*Moderating effect of authentic leadership on cross-functional integration on NSDP*

The current study proposed that the positive relationship between CFI and the success of NSDP will be stronger when the AL style by the NSDP leaders moderates the relationship. The results also supported the above statement as the interaction effect of AL is stronger and significant (See **Table 6**), which indicates that AL acts as a moderator between CFI and the success of NSDP. From the slope analysis, the research study concludes that the direct effect of CFI on the success of NSDP does not significantly influence the relationship, unless the presence of the AL variable is a significant moderator. This means that the higher impact of AL positively affects CFI on the success of NSDP; thus, this research accepted **H7**.

*Moderating effect of firm’s culture on cross functional integration on NSDP*

The research’s result also supported **H8** as service FC positively moderates the effect of CFI on the success of NSDP (interaction term  $\beta = 0.213, p = 0.01$ ). The slope analysis revealed that

No	Relationship	Coefficient ( $\beta$ )	<i>p</i> -value
1.	IPTE*KSB to NSDP	0.262	<0.01 (significant)
2.	CFI*AL to NSDP	0.237	<0.02 (significant)
3.	CFI*FC to NSDP	0.213	<0.01 (significant)

**Note(s):** Cross-functional integration (CFI); Internal project team efficiency (IPTE); Technology infrastructure (TI); Knowledge-sharing behaviour (KSB); Authentic leadership (AL); Firm’s culture (FC); New service development project (NSDP)

\*All estimates are significant at the <0.05 level

**Table 6.**  
Results of SEM  
moderation

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the stronger and greater the influence of FC, the higher the level of CFI leading to the success of the NSDP for the service firms, while the researchers found no significant difference at lower levels of FC in the CFI and NSDP relationship.

## Discussion

Recognizing the challenges of new service development and meeting the need of the target markets, NSDPs need to be successfully accomplished along with important phenomena that influence the overall performance of the service firms. A number of prior investigations were conducted and analysed the various aspects of new product development project success issues only and found that the success of the new product development significantly influences the overall success of the company (Henard and Szymanski, 2001; Carbonell and Rodríguez Escudero, 2019; Good and Calantone, 2019). The specific objective of this study was to recommend and empirically investigate an integrated conceptual model to examine the role of CFI and IPTE in influencing the success of NSDP, the mediating role of TI and IPTE and the moderating role of KSB, AL and FC towards the success of NSDP under the paradigm of four service typologies.

The findings from the configural invariance test revealed that the determinants are significant across four service typologies and service firms may use the same pattern in measuring the items for the success of NSDP. Hence, the findings also revealed that the full-metric invariance was not supported due to the  $\chi^2$  difference between the non-restricted and the full-metric invariance models (Steenkamp and Baumgartner, 1998). Thus, the researchers relaxed step by step the invariance constraints on the basis of the respective modification indices. In the end, a partial-metric invariance model with six of 56 invariance constraints relaxed was supported. The findings support the previous study which confirms that the generic determinants for the success of NSDP do not vary at a significant level (de Jong and Vermeulen, 2003; Kindström and Kowalkowski, 2009; Menor and Roth, 2008; Paswan *et al.*, 2009).

The findings of the study both support and contribute to the service management and project management literature. In line with the existing research studies, this study corroborates the relationship amongst CFI, IPTE and the success of NSDP (Cooper, 2019; Laurent and Leicht, 2019; Castro *et al.*, 2019; Hoegl and Parboteeah, 2006). In addition, the present study uses TI and IPTE to extend and expand the understanding of the relationship between these constructs. The present study finds that TI mediates the relationship between IPTE and the success of NSDP, which supports the previous findings of Bstieler (2005) and McNally *et al.* (2011).

The findings also demonstrate that the success of NSDP elicit both a high and low level of KSB amongst the project team, which affects project team efficiency along with the success of NSDP. This happens because NSDP requires team members who have different perceptions, views, functional background, conflict-handling capabilities, motivation and knowledge (Mitchell and Boyle, 2010; Todorović *et al.*, 2015). Similarly, the present study finds that the role of AL and FC moderates the relationship between CFI and the success of NSDP significantly. AL explains the leadership skills, which integrate transformational and ethical leadership skills with high level of transparency that guide the success of NSDP, where the leaders are true to themselves rather than using the role to simply develop an image amongst the team members (Avolio *et al.*, 2004; Lemoine *et al.*, 2019; Tonkin, 2013). Again, the complexity of NSDP requires the need for close collaboration in the cross-functional team from diverse backgrounds with different professional cultures and subcultures to aggregate in one frame through a standard culture established by the project team management (Ajmal and Koskinen, 2008; Bartsch *et al.*, 2013; and Wiewiora *et al.*, 2013).

The present research study finds that project team efficiency and CFI ability are regulated by the KSB, AL and FC, which strengthens the findings of [Floris and Cuganesan \(2019\)](#); [Zhu et al. \(2019\)](#); [Donnelly \(2019\)](#); [Ajmal and Koskinen \(2008\)](#) and [Maitlo et al. \(2019\)](#). A higher level of KSB amongst the team members and higher IPTE lead to a greater chance of success of NSDP, while no significant difference was observed at a lower effect level of KSB in the relationship between IPTE and NSDP. The following section explains the theoretical and managerial contributions.

### **Theoretical contributions**

The results of the study contribute to the service management literature on the success of NSDP amongst the four typologies suggested by [Jaakkola et al. \(2017\)](#). Though, the result from this research study indicates that the critical success factors of NSDP do not differ across service types, thereby confirming the “*One Basket Fits all*” postulation in the current NSDP research study. The present study demonstrates that for developing a new service, the firms need to address CFI, IPTE and firm’s TI, i.e. TI mediates the influence of CFI on the success of NSDPs. The same variable also mediates the influence of project team efficiency and the success of NSDPs. In addition, overall project team efficiency also mediates the relationship of CFI and the success of NSDPs.

Furthermore, the current study contributes to the literature on new service development by highlighting the important moderating role of team’s KSB, AL and FC to the success of NSDPs with a specific relationship. The current study also conceptualizes and empirically investigates the role of CFI on the NSDP. As the results indicate that CFI is critical for NSDP, we can conclude that prior research on CFI has ignored this by linking it with the mediating effect of IPTE and TI and the moderating effect by AL and FC, which are the significant role to NSDP across the four service typologies. In addition, the study also links with the prediction from resource dependency theory as the NSDPs require a higher level of interdependence amongst the functional divisions of the service firms ([Kim and Wilemon, 2002](#)). It is noteworthy that CFI alone cannot impact service development project success, the IPTE also has a strong impact, directly and indirectly towards NSDPs.

The role of KSB is also dominant for functioning IPTE and NSDP. Hence, a rational belief is that a lack of KSB amongst the team members at the NSDP stage can cause a “good” service to fail. This study finds a positive impact of KSB on the NSDP amongst the four service typologies. Above all, the current research study is an attempt to examine the mediating role of TI and the moderating role of KSB, AL and FC in the success of NSDP in the context of a developing country.

### **Managerial implications**

Traditionally, the successful development of a new service has been linked to the CFI amongst all the departments of the service firm. However, the results of this study indicate that the leader’s role is vital and that service firms need to carefully consider managing and selecting authentic leaders to successfully run the project. The integration of the entire relevant department is critical to the success of NSDP, thus increasing the likelihood of new service success, which requires a strong culture that may guide and set the principles, norms and values across the NSDP team members. Therefore, managers of the NSDP should understand that CFI into the NSDP process is an effective way to bring the “voice of the staff” into the firm in order to make the project successful.

This research further shows that fostering CFI amongst departments is not possible without an appropriate TI and IPTE in all the stages of the NSDP. Thus, service firm’s managers need to focus on various training and development programmes to enhance the

team efficiency in order to finish the NSDP on time. The researchers also recommend that training programmes need to be designed to equip service employees with the requisite skills to manage various service development projects. The training should be directed to the development of AL, the process of the adopting culture of the service firms, managing and sharing knowledge with their colleagues and the urgency of technology in order to enhance their capability for the success of NSDP. In addition, service firms also need establish a standard level of TI, which optimizes both team efficiency and CFI for the success of NSDP. Furthermore, a promising way could be to increase team efficiency by encouraging the team members to share the knowledge in the NSDP process.

In sum, the present study advances the knowledge of service managers' understanding of the critical success factors of NSDP in the context of four service typologies. A more specific practical implication of this research finding suggests that service firms need to design an effective action programme for the NSDP process, where they should be concerned with the aforementioned antecedents and the relationship dynamics.

### Limitations and further research

The present study investigates the critical success factors of NSDP in the context of four service typologies. This study contributes to the existing body of knowledge on leadership, FC, KSB and service firm's TI in the success of NSDP, while acknowledging that the limitations of the study also provide avenues for future research in the service management field. The researchers applied a scenario-based survey approach amongst the employees of service firms to minimize the memory bias associated with recalling the critical success factors of NSDP. Although this type of survey approach fulfils internal validity, it may lack external validity (Martinez *et al.*, 2009). The current study applied the convenience and purposive sampling method due to the unavailability of a sampling frame of the target population of interest. Therefore, future research may be conducted by using probability sampling methods for better representation of the population. In addition, the current research study also extended in further by examining the ranking of importance for those factors across different service typologies. Finally, future research studies could examine other issues such as service firm's structural complexity, uncertainty of the market needs, pace of competition, dynamic information technology (IT) complexity, social-political and institutional complexities in NSDPs.

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