Learning in Service Ecosystems: Conceptualizing Network Learning in Servitization

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Abstract

This study examines the phenomenon of network learning in servitization in the context of service ecosystem where product-based manufacturing firms transform towards offering integrated solutions involving different actors. It analyzes the literature on joint learning, knowledge management and servitization and their interconnectedness in explaining how network learning play a role in servitization and developing joint solutions. Based on theoretically informed inter-disciplinary research, this paper conceptualizes the perspective of co-evolvement by studying the delivery of the solutions through a process of joint learning that takes place between network actors, within the service ecosystem. The findings reveal that the network learning through knowledge sharing, joint sense-making and knowledge implementation in servitization relate to value co-creation for all ecosystem actors. There is a servitization paradox exist, however, by employing coping strategies, firms can avoid the servitization failures where network learning can also play a role as a facilitator. This paper contributes to servitization and joint learning literature by bridging the gaps between scattered scholarship, addressing the recent calls for further research and offers articulated research foundations to understand different dynamics of servitization. The conceptual framework is envisioned to establish a baseline for firms to understand and endeavor the important role of network learning.

Keywords

Network learning and servitization, Joint learning, Service ecosystem, Digital servitization, Service-dominant logic

1. Introduction

Managing business to business (B2B) exchanges have been attributed to improved relationship performance, reduced transaction costs (Shahzad 2018; Shahzad et al. 2018), managing inter-firm conflicts and supplier development (Shahzad et al., 2020; Sillanpää et al., 2015; Shahzad et al., 2016), knowledge exchange and learning (Kale et al. 2000), and inter-organizational risk sharing. Scholars have highlighted and empirically tested several inter-organizational governance mechanisms (including antecedents and outcomes) influencing the relational success (Ali et al. 2021; Shahzad et al. 2020). In addition to such governance mechanisms, the ability to learn from such relational interactions is essential for firms in globalized and networked economy, where the role of capabilities, competencies and knowledge is emphasized as central ingredient to competitive advantage (Bäck and Kohtamäki 2016). For this, the existing literature emphasizes the critical role of relationship learning in developing dynamic capabilities and innovating new knowledge of firms. The relationship among different actors of value chain create complementary interdisciplinary knowledge of manufacturing and service from ecosystem of upstream and downstream firms. Firms benefit from such inter-organizational coordination, learning, agile co-creation and their entrepreneurial orientation (Sjödin et al. 2020) in channelizing ideas and improving decision making for innovative products (Bouncken et al. 2016). Seminal scholars (e.g., Shahzad et al. 2018; Shahzad 2018; Huikkola et al. 2013) added that sharing information and knowledge as well as relationship specific investments in R&D alliances support in realizing the firms' potential in creating joint value. Prior literature views relationship learning as dynamic capability of the firm which considers it as a joint activity among different actors of ecosystem including sharing important knowledge, joint sense making and knowledge integration into relational memory (e.g., Huikkola et al. 2013; Selnes and Sallis 2003; Sirén, et al. 2012; Kale and Singh 2009), yielding collaborative advantages for ecosystem actors. Prior research has also been examining the relational practices, mechanisms and facilitators that enable joint learning in ecosystem collaboration

of innovative R&D where relational learning process as a dynamic capability is examined (Huikkola et al. 2013; Bäck and Kohtamäki 2016). In addition to R&D collaboration, recent research interest towards the role of relationship learning in service innovation (hereafter servitization) is developing, where scholars are paying attention to this evolving concept. Thus, the role of network learning in service ecosystem where the ability of manufacturing companies to offer advanced services dominate, remains an open question in the servitization literature.

The evolving trends of subcontracting, specialization and knowledge intensive businesses prevailing in several industries that have directed customers to consolidate their purchases and strive for suppliers that offer more far-reaching integrated solutions. This phenomenon has stimulated developed solutions (integrated products and/or services) meeting customers' requirements and value creation, referred to as servitization – a strategic approach (Jaakkola and Hakanen 2013; Nordin and Kowalkowski 2010; Huikkola et al. 2020). In servitization, the process of network learning is particulary significant as it contains the exchange of tacit experimental knowledge that is difficult to share, make sense of, or implement. Servitization is a process involving multiple actors within the ecosystem, which coevolve for innovation and performance. Network learning aids service ecosystem of manufacturing companies, creating tacit knowledge, accumulated experience and competencies while improving the effectiveness of relationships (Bäck and Kohtamäki 2016). The process of co-evolvement through such learning is increasingly viewed as an enabler and driver of the firm's competitive advantage and delivery of smart solutions.

However, regardless of successful outcomes of servitization (e.g., improved customer satisfaction, higher profitability and relational stability), the servitization literature provides limited evidence of network learning in co-creating integrated solutions with customers. As manufacturing firms are shifting their focus from being product-oriented entities to more product-and-service oriented entities by providing customized and smart solutions, joint learning in such co-creation relationship remained unexamined. This indicate that network learning in service ecosystem may lead to advancing intensive knowledge and optimal outcomes, while avoiding servitization failure and deservitization (Valtakoski 2017). Recent research has also highlighted this shortcoming and call for further research on network learning process by recognizing its potential to greater network success (Melton and Hartline, 2013; Kale and Singh 2007; Huikkola et al. 2013; Dubruc et al. 2014; Saul and Gebauer 2018; Korhonen 2016; Fliess and Lexutt 2019), and follow greater variety and depth while conceptualizing the process of co-evolvement in delivering integrated solutions within the service ecosystem.

1.1 Objectives

The purpose of this conceptual research is to offer a theoretical explanation of significant role network learning can play in servitization, as the extant works on servitization is clearly in flux in such links by providing a coherent theoretical foundation for thorough analysis (Gebauer et al. 2012; Valtakoski 2017). This study extends the discussion of network learning in servitization literature by adopting the perspective of co-evolvement by studying the delivery of the solutions through a process of joint learning that takes place between the network actors, within the service ecosystem. This study uses the concepts of relationship/network learning to understand the process of solution delivery. Moreover, the existing servitization literature provides minimal information about the process of network learning in service ecosystem while neglecting the innovative collaborative process (Huikkola et al. 2013; Davis and Eisenhardt 2011). Grounding on organizational learning and servitization literature, this paper presents a discussion on the conceptualization of different aspects of network learning in servitization-based co-creation and provide suggestions for future research. This integrated theoretical view of network learning enables the investigation and delineation of servitization. This viewpoint reflects network learning to be a key resource of firms, and propose that firms exist to facilitate the integration of network learning.

Network learning in service ecosystem is still in its infancy, requiring thorough definition and conceptualization. This research argues that network learning is inherently embedded in service triads because such interactive collaboration in ecosystem provides an opportunity for firms to co-evolve developing their knowledge base and competencies in providing smart solutions. Therefore, in service triads, joint learning the process of co-evolvement by delivering the solutions that takes place between the network actors within service ecosystem. Since the literature on network learning in service ecosystem is in its infancy, a commonly accepted definition does yet exist. I define network learning in service ecosystem as "a process of co-evolvement in delivering the smart solutions through a process of joint learning that takes place between the network actors within the service ecosystem".

This study contributes to servitization literature in several ways. For example, it addresses the call for further research on network learning process by several authors (e.g., Melton and Hartline 2013; Kale and Singh 2007; Huikkola et al. 2013; Dubruc et al. 2014; Saul and Gebauer 2018; Korhonen 2016). Furthermore, it develops an integrated theoretical framework which leads toward providing a more articulated research foundations for network learning in service triads as well as for future research. This incorporation of network learning in service innovation will help to comprehend different dynamics of servitization.

2. Conceptual Framework

Network learning in servitization encompasses information management and knowledge transfer and share during product-service integration system that enhance organizational capabilities to develop smart solutions. It underlines its linkage to research on dynamic capability view, resource-based view, social capital view and social exchange view. Although, network learning, as a dynamic capability, is naturally conceptualized and analyzed in the context of knowledge management, a growing interest of its embeddedness in servitization is developing. Thus, based on the scattered evidence in existing literature, this research employs a learning through dynamic interactions and co-evolvement approach in service ecosystem in order to develop a conceptual framework. Such co-evolvement approach was considered relevant for this study to understand the concept of network learning in the process of solution delivery and to provide a link through which firms can institutionalize such learning into operations. Further, as servitization literature provide limited evidence of network learning in co-creating integrated solutions with customers, such approach may lead to advance knowledge and outcome of service ecosystem by avoiding servitization failures and deservitization. The key purpose of network learning in service ecosystem is to obtain a rather well-integrated knowledge collaboration with those who have the same interest of developing service innovation. Similarly, such approach also provides an opportunity to untangle the connection between network learning, value co-creation, servitization and its paradox, which is a way forward to firms who aim to integrate learning into their relational memory. Although theorizing at each individual concept i.e. servitization, network learning, knowledge sharing, joint sense-making and knowledge implementation to create value co-creation, a holistic view of network learning in servitization as joint interactions remains missing from the whole picture. Therefore, the approach of conducting a rigorous research while providing a holistic view is deemed appropriate in this study.

2.1 Servitization

Servitization, also coined as product-service systems, service infusion, service transition or transformation (Kowalkowski et al. 2017; Rabetino et al. 2018; Raddats et al. 2019), is being referred to the transition of product-based manufacturing firms towards offering inclusive integratd solutions, ranging from industrial products coupled with advanced services to knowledge-intensive business life-cycle solutions, wherein different actors of ecosystem are involved and get benefited (Tuli et al. 2007; Valtakoski 2017; (Huikkola and Kohtamäki 2018; Kowalkowski et al. 2015; Parida et al. 2014; Visnjic et al. 2017). The strategic benefits include stability in revenues, profitability and improved customer satisfaction. Prior research on marketing view servitization as a transition of manufacturing firms from tactical marketing – where services are considered as a part of product marketing mix, to relational marketing and value co-creation and customer integration (Homburg and Garbe 1999; Grönroos 2011; Vargo and Lusch 2008; Valtakoski 2017), necessitating companies to redefine organizational culture, structure and customer relationships (Gebauer et al. 2010; Edvardsson et al. 2008; Penttinen and Palmer 2007). Prior research on servitization has stressed that the advanced service provision or service innovation include more relational technique as intensive involvement of customers and ecosystem partners is vital in value creation processes (Sjödin et al. 2019; Parida et al. 2019; Lusch et al. 2016). Prior empirical research has operationalized the level of servitization through service offerings where the scope of these advanced services (by communicating the strategy of firm's integrated solutions, business model and value creation) offers reflection of firms' products with bundled services (Partanen et al. 2017; Lenka et al. 2017; Gabauer et al. 2010; Kohtamäki et al. 2020a).

Recent servitization research emphasizes that the combination of product and service businesses from a transition to integrated solutions offer unique competitive advantage and strategic benefits to manufacturing firms (Kohtamäki et al. 2020a; Kohtamäki et al. 2019; Sjödin et al. 2020). Therefore, increasing competition is driving firms to evolve and experience extensive structural and resource transformation in complementing the products with a bundle of value-added services in order to re-position themselves as solution provider and deliver service innovation (Kohtamäki et al. 2013; Lütjen et al. 2019; Saul and Gebauer 2018; Sjödin et al. 2019). Such advanced service and integrated solutions are referred to complex blend of products, services, software, process support, and intensive knowledge and learning that transform manufacturing firms to achieve competitive advantage (Baines et al. 2017; Sjödin et al. 2019).

2.2 Servitization

Current digital era and the disruptive digital technologies support radical innovation in industrial offerings including products, services, processes and business models in innovation ecosystem, which is termed as digital servitization (Kohtamäki et al. 2020a; Sklyar et al. 2019; Sjödin et al. 2020). Sjödin et al. (2020) defined digital servitization as "*the transformation in processes, capabilities, and offerings within industrial firms and their associate ecosystems to progressively create, deliver, and capture increased service value arising from a broad range of enabling digital technologies such as the Internet of Things (IoT), big data, artificial intelligence (AI), and cloud computing*". Thus, regardless of certain challenges, investing in advanced digital innovations that connect to servitization has become an important source of competitive advantage for manufacturing firms. However, considering these challenges associated with digital service innovation is also important. Since technology is radically evolving, firms usually struggle to match their digital capability with the evolving technological developments (Sjödin et al. 2018). Furthermore, firms are not often being established for co-creation and co-innovation while neglecting the customer engagement in ecosystem, thereby, face challenges in value creation. Such uncertain outcomes of digital servitization lead firms into service paradox (Sjödin et al. 2020; Kohtamäki et al. 2020b).

2.3 Servitization Paradox

Gebauer et al. (2005) coined the term service paradox and argued that service paradox is referred to manufacturing firm's situation where it makes large investments in services but struggles to capture the most out of it in terms of return on investments as they incurred higher costs. Such tensions in the transition from being product-oriented to service-oriented firm, increase challenges and barriers mitigating the successful transition and trigger the processes of servitization failure and deservitization (Valtakoski 2017; Kowalkowski et al. 2017; Kohtamäki et al. 2020b). Prior research on servitization has argued that such transition of service innovation is far from easy (Rabetino et al. 2017; Raja et al. 2017) as usually the extant research has offered over simplified arguments that have been discussed in recent research (e.g., Kowalkowski et al. 2017; Raddats et al. 2019). While capitalizing on advanced service innovation under different market conditions, manufacturers with servitization strategies take a greater responsibility and risks, and face several challenges in transition process (Kohtamäki et al. 2020a; Kowalkowski et al. 2017). Furthermore, prior research has also documented the servitization failure and abandoning service elements in their service solution (i.e. deservitization), as firms struggle to achieve the related advantages of servitization due to the lack of experience and inter-firm learning (Valtakoski 2017). Thus, firms are required to engage with customers, co-create and share relevant and intensive knowledge as it would enable them not only to learn but also store and use the knowledge for service innovation.

Grounding on paradox theory, several researchers has delved into this and provided several coping strategies for servitization paradoxes (e.g., Kohtamäki et al. 2018a; Kohtamäki et al. 2020b). They argued that firms need to learn how to live with, understand and survive such paradoxes in order to bring order into the chaos. Bringing middle managers to center and highlighting the management system, firms can balance the cope with tensions effectively by adopting different coping strategies, for example, accepting, accommodating, differntiating, and integrating (Kohtamäki et al. 2018a). A service-oriented structure facilitates solutions delivery effectively while keeping product and service operations aligned. A separate unit run by manufacturers can support successful solution delivery while developing their own organizational capabilities, processes, and resources. Furthermore, developing modular solutions for customers might help in curtailing delivery costs without losing the processes of customization (Kohtamäki et al. 2018a).

2.4 Network Learning View of Servitization

Industrial servitization becomes closer to knowledge intensifies learning economy (Korhonen, 2016). Organizational network learning, information management, and knowledge transfer support in developing the process related capabilities in customer-specific services by combining and integrating technical, production-related competencies (Le Meunier and Baumann 2011; Fliess and Lexutt 2019). Different firms have different learning capabilities considering some are capable enough for internal learning being more focused towards assimilating knowledge from their external partners (Bouncken et al. 2016). Value networks strive to constantly learn, evolve and adapt to changing environment in order to provide competitively compelling value proposition (Lusch et al. 2010), however, the question of how network learning in service innovation is achieved and experienced remains important to understand. As significant part of network capabilities, network learning capabilities promote inter-organizational knowledge, internal communication, relational learning process and mechanisms that allow industrial firms to align inter-organizational

relationships for value co-creation in service ecosystem (Kohtamäki et al. 2013). It requires partners to create joint understanding and interaction which lead organizations towards developing their knowledge base from experiences and higher-order capabilities guiding the evolution of dynamic capabilities (Saul and Gebauer 2018). Figure 1 conceptualizes the potential roles and practices of joint learning in service ecosystem depicting network learning view of servitization.

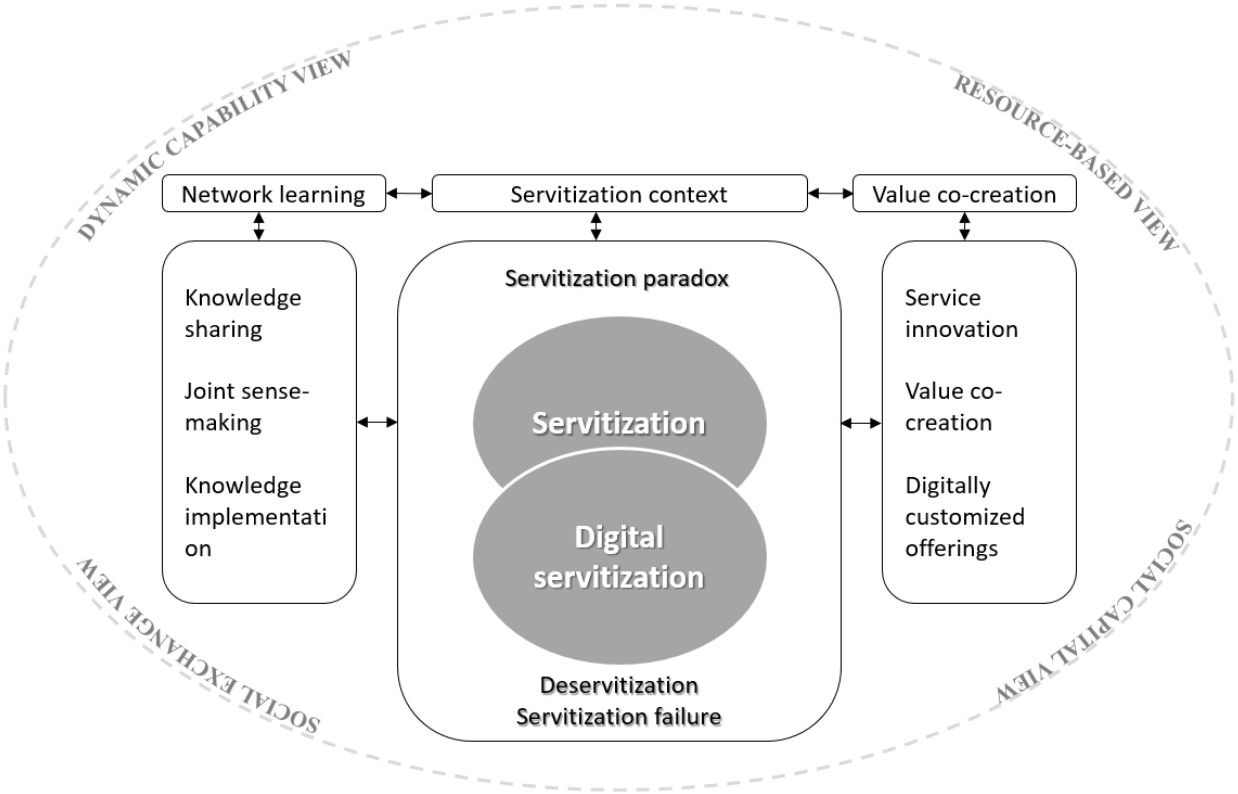

Figure 1. Network learning view of servitization

The importance of collaboration ability to engage with other partners for value creation has been widely acknowledged in a networked economy as it facilitates joint innovation, alliances for customer care and supply/value chain coordination. Similarly, managing, integrating and learning capability in network also lead firms towards offering innovative solutions, value co-creation and performance. Based on systematic review, Kohtamäki et al. (2018b) identified network capabilities and different dimensions based on second-order and first-order categories where alliance learning capability as a dimension include knowledge creation, assimilation and internalization. Aligned with organizational learning and absorptive capacity literature, network learning capabilities enable firms to articulate, codify, share and internalize knowledge with ecosystem partners in order to support relational and firm level innovation and development (Kale and Singh 2007; Kohtamäki et al. 2018b). Thus, firms are required to develop network learning capabilities in order to create, share, make sense, and integrate knowledge with service ecosystem partners that support the network development and innovation. For this purpose, several network learning related activities can be identified from prior literature, for example, relational experience (Capaldo 2007; Garrette et al. 2009; Kale and Singh 2007; Wittmann et al. 2009), relational information sharing and interdependence (Shahzad et al. 2020; Shahzad et al. 2018), relationship governance (Shahzad 2018), relational training and partner development (Sillanpää et al. 2014; Shahzad et al. 2016), organizational memory and knowledge stores (Johnson et al. 2004), and conflict resolution (Shahzad et al. 2020).

Network learning plays an important role for firms to develop advanced service offerings and innovation within service ecosystem, as innovative capacity of firms is developed in network and firms comprehend and coordinate in developing industrial offerings. Prior literature on network learning capabilities has been linking the concept such as relational learning process, learning mechanisms and sharing of knowledge with dimensions of alliance learning

capabilities (Huikkola et al. 2013; Kale and Singh 2007). In particular, scholars (e.g., Huikkola et al. 2013) contemplated joint learning concept which emphasizes the learning process of different firms through interaction. This concept becomes important also in service ecosystem as several firms get involved to develop an integrated solution and create a great potential for joint learning. Dynamic capability view also support network learning in facilitating firm's improved product innovation, as it's been conceptualized as a higher-order capability that enable firms to create, extend and modify the existing resources (Teece 2007; Bouncken et al. 2016). Network learning as a dynamic capability can promote creativity and novel business and product-service ideas and innovation across the firm's boundaries in service ecosystem. Furthermore, social capital view of innovation has also stressed the importance of information sharing and new knowledge development in servitization as learning process that transform firm's intellectual behavior and practices (Baker and Sinkula 2002; Leenders and Gabbay 2013). This learning process develops network capability to implement effective service innovation, necessitating manufacturing firms to adapt and transform their focus towards more compelling value proposition and improved customer experience by integrating internal and external resources (Agarwal and Selen 2015; Melton and Hartline 2013; Lusch et al. 2010).

Relational-level phenomenon (i.e., interaction and relational practices among ecosystem partners) also required further attention in service ecosystem as such collaborative practices are also considered as significant sources of joint learning in networks (Selnes and Sallis 2003; Bäck and Kohtamäki 2016). The process of joint learning in networks in servitization offers partners with high-order tacit experimental knowledge that facilitates in developing new knowledge base as well as is quite complex to share, make sense of or implement (Huikkola et al. 2013; Bäck and Kohtamäki 2016). Similarly, joint learning in service network allows in developing shared experience as well as encourages accrued technological understanding in ecosystem, which in turn becomes the key driver of service innovation. However, mutual trust has a central role where external relationships are involved (Bäck and Kohtamäki 2016). Certain factors such as environmental uncertainty, environmental dissimilarity, organizational fit, and interdependence enable relationship learning (as it is critical strategic element of relational value) regardless of certain risks and challenges involved with these factors. Thus, the locus of service innovation can be found in learning networks while taking control over external challenges or responding to market changes or challenges (Cheung et al. 2010).

Regarding the relationship between network learning and innovation, Fang et al. (2011) found that sharing information within network and joint sensemaking or knowledge flow have a positive impact on relationship-specific memory (i.e. developed knowledge stock of firms), influencing explorative and exploitative innovation. Such relational practices and related relational investments, relational structure, and relational capital also support joint learning in network (also considered as relational dynamic capability) and improved collaborative advantage (Huikkola et al. 2013) in service offerings. Furthermore, co-creation of knowledge-intensive business services necessitates network learning and understanding of customer experiences and processes through communication and joint problem solving. This helps firms to avoid service paradox (e.g., deservitization and servitization failure) in service ecosystem (Kohtamäki and Partanen 2016). Similarly, network learning plays a significant moderating role reinforcing the potential absorptive capacity and realized absorptive capacity link in order to enhance the results of service innovation (Leal-Rodriguez et al. 2014). Network learning in service ecosystem also facilitate in designing attractive product-service business models that largely depends on learning customer's challenges and sharing information to offer value proposition (Parida et al. 2015). Regarding value co-creation in digital servitization, agile micro-service innovation approach required by incremental micro-service investments, sprint-based micro-service development and micro-service learning by doing plays a central role in ensuring customized and scalable digital service offerings. In such situations, relational teams (by pooling knowledge from providers' and customers' strategic, technological and operational areas) facilitate successful collaboration as well as relational governance (Sjödin et al. 2020). However, Valtakoski (2017) have argued that knowledge bases of service network also change over time as network learning for a specific integrated solution may vary. In such situations, network firms involved in joint service innovation may change the solution and needed knowledge by solution modularization and knowledge codification, that offers new learning and unique solutions for network.

3. Conclusions and Implications

The purpose of this conceptual research was to offer a theoretical explanation of significant role network learning can play in servitization, as the extant works on servitization is clearly in flux in such links by providing a coherent theoretical foundation for thorough analysis (Gebauer et al. 2012; Valtakoski 2017). The conceptual framework of this study offers several implications as well as avenues for further research. This paper advances the servitization literature by adopting the perspective of co-evolvement by studying the delivery of the solutions through a process of

joint learning that takes place between the network actors, within the service ecosystem. Furthermore, the proposed conceptual framework offers a more articulated research foundation for network learning in service triads as well as for future research. This incorporation of network learning in service innovation will help to comprehend different dynamics of servitization. This study contributes to servitization literature and addresses the call for further research on network learning process by several authors (e.g., Melton and Hartline 2013; Kale and Singh 2007; Huikkola et al. 2013; Dubruc et al. 2014; Saul and Gebauer 2018; Korhonen 2016). The key argument of this paper advises practitioners to contemplate how they can learn through servitization process and institutionalize such practices in order to create joint value creation. For the future research, this paper encourages that future research can explore the conceptual framework empirically by collecting primary and cross-sectional data. Importantly, it would be interesting to investigate and identify different strategies that can help firms to address the challenges and paradox of network learning in servitization.

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Biography

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