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# Challenges of servitization: a comparison study on manufacturers with different strategic focuses

*Wanrong Zhang (wanrong.zhang@warwick.ac.uk)  
University of Warwick, Coventry, UK*

*Sujit Banerji  
University of Warwick, Coventry, UK*

*Dawei Lu  
University of Warwick, Coventry, UK*

*Steven Day  
University of Warwick, Coventry, UK*

## Abstract

This research focuses on how the servitization challenges (in terms of organisational structure, business model, development process, customer management and risk management) manifest in the different types of servitized businesses. In this study, we focus on two types of servitized business models: integrated solution providers (IS providers) and product companies providing generic services (PS suppliers). A comparative case study was conducted with 13 UK-based companies and the result shows that the challenges are perceived on different levels in the two cases - the IS providers need to address more challenges than those seeking to supply products with generic services.

**Keywords:** Servitization, Integrated solution, Challenges

## Introduction

It is evident that servitization of manufacturing has been a growing industry trend across different markets and sectors as more manufacturers seek to renovate their business models by shifting from product-centric to customer-centric. There is a mutual understanding of the servitization benefits, as adopting a servitization strategy helps the companies to secure a leading position in the fierce competition (strategic benefits), generate stable revenues through an additional channel (financial benefits) and retain a long-term relationship with business customers (marketing benefits). However, the existing studies indicate that the servitized businesses do not obtain expected financial returns (Matthyssens & Vandenbempt, 2010). This is as the servitization journey involves various challenges that can offset the expected benefits (Zhang & Banerji, 2017). Given that servitized businesses obtain different strategic focuses, there should be a clear understanding of various types of servitized businesses and how the challenges facing them are different (Burton et al., 2017; Kowalkowski et al., 2015). To advance the current

literature, this paper aims to answer the research question ‘How are servitization challenges different in servitized businesses with different strategic focuses (integrated solution providers vs. product suppliers providing generic services)?’

This paper is organised as follows. In the literature review section, different types of servitization are discussed to distinguish them based on the business model and customer management perspectives. Following that, the servitization challenges are discussed concerning the current literature to provide a rounded view. In the methodology section, a case-based qualitative research design is presented following a sequence from the case design, data collection and analysis. Finally, the key findings are discussed and compared with the current literature to contribute to the advancement of this research area.

## Literature review

### *Different types of servitization*

Companies undergoing servitization often retain different strategic focuses to achieve market differentiation and fulfil the customers’ needs through compelling offerings. In the current literature, there are many typologies proposed to distinguish servitized businesses (e.g. Baines & Lightfoot, 2013a; Ulaga & Reinartz, 2011), with most typologies looking at the service offering of the company as an indicator of the level of servitization. However, this simple typology is not sufficient to classify the companies as some companies may cover a broad spectrum of services.

It is therefore suggested that the typology should consider the business model of the company and its way of interacting with the customers when identifying its type of servitization. The business model embodies the key strategic focus of a business and it is regarded as a powerful tool to analyse the characteristics of the company (Hedman & Kalling, 2003). With respect to customer relationships, a company shifting from product-centric to customer-centric changes the way it interacts with its customers significantly (Sousa & Silveira, 2017). These elements are crucial in distinguishing the different types of servitization. Thus a new typology is established in this study according to the current servitization literature to classify the servitized businesses with different strategic focuses. Table 1 summarizes the differences between the IS provider and PS supplier based on the two dimensions-business model and customer relationships.

*Table 1 - Comparison of IS provider and PS supplier*

Dimensions		IS provider	PS supplier	References
Business model (internal)	The strategic focus of business model	Integral to customer’s operational process through the delivery of pre-defined performance/result	Fulfilling customer needs by supporting the functional use of products	Sousa & Silveira, 2017
	Value proposition	Providing the use/performance to support customer operations (e.g. power by the hour)	Providing generic service offerings to support functional use/lifecycle of products (e.g. spare parts, maintenance, service contract)	Baines & Lightfoot, 2013a; Baines et al., 2009b; Gebauer, 2008; Kujala et al., 2010; Raddats & Kowalkowski, 2014; Ulaga & Reinartz, 2011

	Organisational structure	<ul style="list-style-type: none"> <li>• High level of interactions among departments</li> <li>• Low formalisation, high complexity</li> </ul>	<ul style="list-style-type: none"> <li>• Low level of interactions among departments ('silo management')</li> <li>• High formalisation, low complexity</li> </ul>	Reim et al., 2015
	Competitive advantage/ customisation of offerings	<ul style="list-style-type: none"> <li>• Differentiation and pro-active value co-creation of customer's requirements</li> <li>• High level of customisation</li> </ul>	<ul style="list-style-type: none"> <li>• Cost leadership on operational cost, standardisation</li> <li>• Customization is mainly available for large customers</li> </ul>	Gebauer, 2008; Kujala et al., 2010; Reim et al., 2015; Sousa & Silveira, 2017; Tukker, 2004; Ulaga & Reinartz, 2011
	Risk	The level of risks is high as the provider shares risks from customer's side	The risk level is low, as the company mainly deal with normal business risks	Baines et al., 2013; Nordin et al., 2011; Reim et al., 2015
Customer relationship (external)	Value determination and perception	Value is mainly determined by the customer and provider	Value is determined by the supplier	Windahl & Lakemond, 2010
	Customer relationship	<ul style="list-style-type: none"> <li>• Long-term relationship building through key account management</li> <li>• Interaction with the end user</li> <li>• Trust is necessary</li> </ul>	<ul style="list-style-type: none"> <li>• Short-term transactional relationship</li> <li>• Limited interactions</li> </ul>	Baines et al., 2009b; Reim et al., 2015; Sousa & Silveira, 2017
	Value co-creation	<ul style="list-style-type: none"> <li>• The customer is involved as a value co-creator</li> <li>• Much 'personal' communication</li> </ul>	<ul style="list-style-type: none"> <li>• The customer is acting as a value receiver and rarely contribute to the value creation</li> <li>• Formal and standardized communication</li> </ul>	Baines et al., 2009b; Reim et al., 2015; Sousa & Silveira, 2017

### *Servitization challenges*

Through a systematic literature review, the servitization challenges are classified into five categories, including organisational structure (OS), business model (BM), the development process (DP), customer management (CM), and risk management (RM) (Zhang & Banerji, 2017). They are now discussed in turn with reference to the current literature to form a theoretical framework.

The literature review indicates that OS requires significant changes while the business is undergoing a servitization journey, and these changes in turn trigger different challenges within the organisation. First, the business culture is shifted from product-centric to solution/customer-centric to support the strategic focus of the business (Martinez et al., 2010). However, the shift of mindset has been acknowledged as a crucial challenge due to the influence of 'path dependency', which means the historical

development path of the company are mainly product-oriented and this organisational 'DNA' inhibits the culture change (Zarpelon Neto et al., 2015). In addition, the internal capability development requires the recruitment of additional human resources, particularly of service professionals. This internal structure reconfiguration often results in resistance to the engendered changes among the current employees, who have been getting used to the 'old' business culture and operational processes (Lenka et al., 2017). It thus takes longer to develop a service team and integrate them with the production team to achieve the internal synergy.

The BM embodies the strategic focus of the business and the detailed operational plan to support the business goals (Hedman & Kalling, 2003). To facilitate the adoption of the servitization strategy, the BM needs to be modified as the business culture changes (Barquet et al., 2013; Kujala et al., 2010). Changing the overall business model is a challenge to the company especially those who shifted from selling pure physical products to integrated solutions, where the service development achieves a critical mass in the overall business. It is found that many BM elements need alterations to support the delivery of servitized offerings. Notably, the value proposition in such an organisation changes from providing physical products to supplying a broad range of services or a bundled solution. This shift involves significant redesign of the value proposition and it may lead to poor design if the company does not possess a clear understanding of customer needs (Barnett et al., 2013; Brax, 2005). Moreover, the resource utilisation supporting the value configuration faces barriers in leveraging the resources across the different departments and increasing the resource base to support the servitized offerings (Barquet et al., 2013; Zarpelon Neto et al., 2015). In addition, the current costing and pricing systems are mostly product-oriented which requires further development to fit with the servitized offerings (Nudurupati et al., 2016). Despite these, the servitized companies need to redevelop its sales force and processes as selling products and services take different approaches (Ulaga & Loveland, 2014).

To align with the BM, the DP in the servitized businesses should be redeveloped address the service development; the typical stages in the product development process are not adequate to the services (Alghisi & Saccani, 2015). Besides, previous studies indicate that a set of pre-developed tools, methods and techniques are essential to facilitate the development process as servitized offerings are more complicated in nature, but they are still in the initial stage of the development (Nudurupati et al., 2016). Given that servitized offerings provide value through pre-defined the performance/functions of physical products, performance measurement is critical to ensure the deliverable meets the standard. Nevertheless, this needs further development as the current one used in the company is mostly adapted to the product functionalities and is not sufficient to measure the servitized offering (Martinez et al., 2010). Despite the internal DP challenges, customer engagement is lacking in the process and the company is unable to gather customer feedback on the design, which may lead to the servitized offerings not matching to the customers' operational needs (Brax, 2005).

CM refers to the relationship building and maintenance among the suppliers and customers. Several relevant challenges were found in the current literature. Firstly previous studies demonstrate that there is a miss-match in the value perception between customers and suppliers. This means the value of servitized offerings perceived by customers is different from the suppliers' perception, and this is mainly caused by poor understanding of what constitutes value for the customer by the supplier (Zhang & Banerji, 2017). Besides, the servitized projects are primarily human-based, which involves uncertainties and unstable factors (Barnett et al., 2013). This is likely to reduce the performance reliability and cause negative impacts on the established customer

relationship. In addition, the value co-creation between suppliers and customers are mainly promoted to achieve better operational efficiency, which requires the customers to share some of their operational data to support the IS delivery. However, the research indicates that some customers refuse data sharing as they have concern over commercial confidentiality and data security (Matthyssens & Vandenbempt, 2008).

The RM has attracted enormous attention in the current servitization literature as the four challenges discussed above significantly increase the level of operational risks within the organisation (Zhang & Banerji, 2017). Apart from these risks, the servitized companies, particularly the IS suppliers, need to share the business risks with customers in order to realize the value of the offering, which escalate the operational challenges to a higher level (Nordin et al., 2011; Reim et al., 2016). In addition, the financial investment for developing the servitized businesses can be expensive and might not be returned as expected because the operational challenges may easily offset the revenues in the early stage of the journey (Benedettini et al., 2015).

In summary, the servitization challenges can be classified into five clusters as shown in table 2.

*Table 2 – Overview of servitization challenges*

<b>Servitization Challenges</b>	<b>Key Constructs</b>	<b>References</b>
Organisational structure (OS)	<ul style="list-style-type: none"> <li>• Culture change</li> <li>• Internal structure reconfiguration</li> <li>• Value co-creation</li> </ul>	(Alghisi & Saccani, 2015; Brax, 2005; Martinez et al., 2010)
Business model (BM)	<ul style="list-style-type: none"> <li>• Modifying the overall business model</li> <li>• Value proposition</li> <li>• Value configuration</li> <li>• Costing mechanism</li> <li>• Pricing mechanism</li> <li>• Internal sales channel</li> </ul>	(Barnett et al., 2013; Barquet et al., 2013; Brax, 2005; Ng & Nudurupati, 2010; Ulaga & Loveland, 2014)
Development process (DP)	<ul style="list-style-type: none"> <li>• Development of an integrated process</li> <li>• Development of toolkit</li> <li>• Performance measurement</li> <li>• Customer involvement</li> </ul>	(Alghisi & Saccani, 2015; Martinez et al., 2010; Nudurupati et al., 2016)
Customer management (CM)	<ul style="list-style-type: none"> <li>• Customer needs and expectations</li> <li>• Performance reliability</li> <li>• Value perception</li> <li>• Value co-creation</li> </ul>	(Barnett et al., 2013; Brax, 2005; Martinez et al., 2010; Ng & Nudurupati, 2010)
Risk management (RM)	<ul style="list-style-type: none"> <li>• Operational risks</li> <li>• Financial risks</li> <li>• External risks</li> </ul>	(Benedettini et al., 2015; Benedettini et al., 2017; Brax, 2005; Reim et al., 2016)

## **Research method**

In the literature review, it was established that companies adopt their servitization strategies to serve different strategic focuses and that the servitization challenges can be aggregated from the five perspectives. However, there is no evidence in the existing research indicating how the challenges manifest in the different types of servitization. To explore this further, a comparative case study approach is considered to be appropriate in this study to enrich the theory developed in this area (Yin, 2014).

A purposive sampling approach was used in this study to facilitate the case selection during which companies were chosen based on a set of pre-defined selection criteria to

ensure that they fit into the research context (Bryman, 2016). The primary selection criteria were: a) large organisations in the UK (with an annual turnover of over £1 million), b) operating in specific sectors (as evidenced by the UK SIC code), and c) adopting a servitization strategy (evidenced by the service revenues and core offerings). In total, 13 UK-based companies operating across multiple sectors were engaged in the study, which were divided into 9 IS providers and 4 PS suppliers according to the typology in Table 1.

The data was collected through a series of 13 semi-structured interviews with senior management representatives from the companies. Following this, the data analysis was carried out using the thematic analysis method. All of the interviews were recorded and transcribed verbatim for the preparation of the data analysis. A codebook was pre-developed according to the theoretical underpinnings of the study and the initial review of the interview transcripts. Following this, the transcripts were coded through three rounds of reviews to capture the full insights from the interviews. The emerging patterns were identified by categorizing the codes into themes, and a singular tabular display was developed to facilitate the cross-case analysis.

### Findings and discussion

With respect to the research question, the data analysis findings showed that the IS providers and PS suppliers face different levels of servitization challenges (SC). Table 3, below, highlights the servitization challenges identified in the current literature and how they exhibit in the two cases. To illustrate the comparative findings, the cases are rated according to the level of the challenges that are perceived in each case.

*Table 3 - Servitization challenges face IS providers and PS suppliers*

SC	IS providers	PS suppliers
OS	<ul style="list-style-type: none"> <li>• High</li> <li>• The shift of business culture is challenging as the employees are not able to grasp the notion of IS</li> <li>• Products and services being managed separately (silo management) is a barrier to the achievement of internal value co-creation (departmental synergy)</li> </ul>	<ul style="list-style-type: none"> <li>• High</li> <li>• The shift of business culture is prevented, as the existing employees are resistant to the internal changes</li> <li>• Internal competition among service and production teams detract focus from responding to the external customers</li> </ul>
BM	<ul style="list-style-type: none"> <li>• High</li> <li>• Modifying the overall business requires constant improvements</li> <li>• The design of value propositions requires a solid understanding of customer needs</li> <li>• Efficient resource utilisation among the functional groups is difficult to achieve</li> </ul>	<ul style="list-style-type: none"> <li>• Low</li> <li>• Expanding service portfolio requires a separate sales channel</li> </ul>
DP	<ul style="list-style-type: none"> <li>• High</li> <li>• The integrated development process is lacking, and silo management makes it difficult to develop such a process</li> <li>• The companies find it difficult to develop the measures for evaluating the performance of the IS delivery</li> </ul>	<ul style="list-style-type: none"> <li>• Low</li> <li>• The customer engagement in the process is insufficient so the companies are not able to gather customer feedback on the service design</li> </ul>

CM	<ul style="list-style-type: none"> <li>• High</li> <li>• There is a miss-match of value perception between the customers and suppliers</li> <li>• It is difficult to engage the customers as a value co-creator in the IS delivery</li> <li>• Blurred customer expectations increase the uncertainties of IS delivery</li> <li>• Retaining reliable performance during the contracted project is challenging to the suppliers</li> </ul>	<ul style="list-style-type: none"> <li>• High</li> <li>• The value of service offerings especially the service contracts are not clear to the customers</li> <li>• Understanding customer's needs and setting clear expectations are difficult due to lack of customer engagement</li> <li>• Business customers may potentially compete in the same market</li> <li>• Accessing end users (the customers of business customers) may create tensions in the customer relationship</li> </ul>
RM	<ul style="list-style-type: none"> <li>• High</li> <li>• The above challenges increase the level of operational risks inside the company</li> <li>• Suppliers sharing operational risks with customers aggravate the operational risks</li> <li>• Heavy upfront investments on the servitization and potential penalties in the IS contracts escalate the financial risks</li> </ul>	<ul style="list-style-type: none"> <li>• Low</li> <li>• Expanding service portfolio trigger operational risks inside the business</li> </ul>

#### *Organisational structure (OS) challenges*

Our findings suggest that the two cases perceive the OS challenges at the same level, particularly the challenges of the internal value co-creation (Gebauer, 2008) and the shift of business culture (Kowalkowski et al., 2015; Martinez et al., 2010). In terms of internal value co-creation, the IS providers claim that silo management of production and service teams inhibit the achievement of internal synergy as the roles and responsibilities are clearly defined and they are not likely to intervene each other. In the PS suppliers, product and service teams work in a sequential order, which the potential competition over financial performance has been identified and caused the tension among the team. The senior management stressed that this tension becomes a barrier to the intra-departmental collaboration and causes negative influences in responding to the external customers. With respect to shifting the business culture, the employees in the IS providers found it difficult to fully understand the servitization strategy and the senior management needs to spend more efforts on the ongoing discussions and intensive education to improve their understanding. In the PS suppliers, this appears different. It is noticed that the current employees who work in the product-centric business over the decades show a high level of resistance to the adoption of servitization as they see service growth as a potential threat to their positions. These points support the findings from the current literature (Gebauer, 2008; Kowalkowski et al., 2015; Martinez et al., 2010; Zhang & Banerji, 2017), and provide a more nuanced understanding of the challenges. Although the OS challenges are perceived at the same level in the cases, they are manifested in a different way depending on the strategic focus of the business.

#### *Business model (BM) challenges*

In terms of the BM challenges, our study extends the previous research in exploring that IS providers face significant challenges in modifying their business model (Barquet et al., 2013). Particularly, the IS providers encounter barriers in designing a proper value



proposition to address customer's needs (Barnett et al., 2013; Brax, 2005) and balancing the resource utilisation among the internal departments (Zarpelon Neto et al., 2015). The interviewees claimed that developing a 'new' business model to support the delivery of IS is an ongoing process as they have to improve the offering through an iterative process to make it fit with the customer's business. Due to the varieties of customer segments, understanding their operational challenges is difficult and this may lead to an inappropriate value proposition. To support the delivery of IS, the companies often need to increase their resource base to support such complex offerings. However it appears difficult to increase internal capacity while retaining lean operations in day-to-day business. In contrast, these challenges seem absent in PS suppliers. The only BM challenge in the PS companies is to develop a separate sales channel to support the service business, as selling the services requires a different approach and mentality (Ulaga & Loveland, 2014). To address this, they need to recruit and develop a service sales team to support the operation and simplify the overall sales process to avoid confusing customers in terms of whom they should talk to when encountering any problems. It is therefore to conclude that IS providers encounter a higher level of BM challenges than PS suppliers.

#### *Development process (DP) challenges*

With respect to DP, the two cases encounter a few challenges differently, including the development of integrated processes (Alghisi & Saccani, 2015; Kowalkowski et al., 2015), the evaluation of performance (Martinez et al., 2010), and customer engagement in the process (Brax, 2005). In the IS providers, the first two challenges reinforce existing perceptions in the current literature. The interviewees highlighted that the separate management of product and service teams cause the development process to remain separate and prevent the development of an integrated process. Regarding the performance measurement, the product-oriented metrics were mainly used prior to the servitization, which requires a new performance measurement to evaluate the overall performance. In contrast, the DP challenge is reflected at the lower level in the PS suppliers. The lack of customer engagement is the only DP challenge in this case as the PS suppliers found that customers are hard to engage in the process as they may not see the direct benefits to them or, if engaged, they are not engaged in the way the company would require (Zhang & Banerji, 2017). As has been noted, the IS providers and PS suppliers face a high and low level of DP challenges respectively.

#### *Customer management (CM) challenges*

In terms of customer management, our study reveals that the two cases perceive the same level of the challenges. Similarly, both IS and PS claim that understanding customers' needs and setting clear expectations is a challenge, especially when the company targets a broad spectrum of business customers across the different sectors (Zhang & Banerji, 2017). Poor customer understanding and unclear expectations may cause the customer value perceived being different from that of the supplier's side, and the offerings may be rejected by customers. In contrast, these two types of businesses obtain some different challenges. In IS providers it was perceived difficult to engage customers as value co-creators as they may refuse to share operational data, which is a crucial resource for supporting the IS delivery (Matthyssens & Vandenbempt, 2008). Besides, supplying reliable performance is a challenging task as the IS delivery relies on the human resources that involve many uncertainties. This could damage the supplier's reputation if they are not able to deliver consistent performance (Brax, 2005; Martinez et al., 2010). The challenges facing PS suppliers are slightly different. First, they face potential competition from the business customers especially when they are capable of doing services in-house

at a lower cost. Second, the PS providers sometimes need to access the end users to support their experience bypassing the business customers. This creates the tensions between them as the business customers may consider them as a potential threat to their business. These points extend the current literature, especially as the challenges face the product companies with a generic service portfolio lacks in the existing studies. Overall, the CM challenges appear to be at the high level in both cases and they are manifested quite differently.

#### *Risk management (RM) challenges*

With respect to RM, our study supports the previous research in finding that servitized companies engender many operational challenges as adopting a servitization strategy triggers numerous changes in different parts of the business (Benedettini et al., 2015; Benedettini et al., 2017; Reim et al., 2016). This is true in the two cases as it is strongly supported in the interviews. Despite this, IS providers suffer more risks than PS suppliers. IS providers are committed to sharing the operational risks with business customers to realize the value in-use, which aggravates the level of risks in the provider's side (Reim et al., 2015). Although the PS suppliers may need financial investments to expand the service portfolio, the IS providers suffer greater financial risks as the IS business requires heavy upfront investment and the contracts are mostly attached with financial penalties (Matthyssens & Vandenbempt, 2010; Zhang & Banerji, 2017). The company may need to pay expensive penalties if they cannot deliver the agreed outcome/performance on time. Our findings demonstrate that IS providers retain more risks in comparison with PS providers as the former faces a lot more changes in the business and is willing to take more risks to get higher returns on investments.

#### **Conclusion**

To summarize, this study advances the current servitization research by exploring how servitization challenges manifest in servitized businesses with different strategic focuses. The cross-case study results indicate that IS and PS companies have a different profile in terms of servitization challenges; the IS providers generally encounter more challenges than the PS suppliers as their businesses need to address additional internal and external challenges to facilitate the implementation of servitization strategy. It is relevant to note that some challenges are reflected at the same level in the two cases, such as all scored 'high' in organisational structure and customer management challenges, and others are different among the cases.

#### **References**

- Alghisi, A., & Sacconi, N. (2015). Internal and external alignment in the servitization journey – overcoming the challenges. *Production Planning & Control*, 26(14-15), 1219-1232.
- Baines, T., & Lightfoot, H. (2013a). Made to serve; Understanding what it takes for a manufacturer to compete through servitization and Product-Service Systems. *Hoboken: Wiley*.
- Baines, T., Lightfoot, H., Peppard, J., Johnson, M., Tiwari, A., Shehab, E., & Swink, M. (2009b). Towards an operations strategy for product-centric servitization. *International Journal of Operations & Production Management*, 29(5), 494-519.
- Barnett, N. J., Parry, G., Saad, M., Newnes, L. B., & Goh, Y. M. (2013). Servitization: Is a Paradigm Shift in the Business Model and Service Enterprise Required? *Strategic Change*, 22(3-4), 145-156.
- Barquet, A. P. B., de Oliveira, M. G., Amigo, C. R., Cunha, V. P., & Rozenfeld, H. (2013). Employing the business model concept to support the adoption of product-service systems (PSS). *Industrial Marketing Management*, 42(5), 693-704.
- Benedettini, O., Neely, A., & Swink, M. (2015). Why do servitized firms fail? A risk-based explanation. *International Journal of Operations & Production Management*, 35(6), 946-979.

- Benedettini, O., Swink, M., & Neely, A. (2017). Examining the influence of service additions on manufacturing firms' bankruptcy likelihood. *Industrial Marketing Management*, 60, 112-125.
- Brax, S. (2005). A manufacturer becoming service provider – challenges and a paradox. *Managing Service Quality: An International Journal*, 15(2), 142-155.
- Bryman, A. (2016). *Social research methods* (Fifth Edition ed.): Oxford : Oxford University Press.
- Burton, J., Story, V. M., Raddats, C., & Zolkiewski, J. (2017). Overcoming the challenges that hinder new service development by manufacturers with diverse services strategies. *International Journal of Production Economics*.
- Gebauer, H. (2008). Identifying service strategies in product manufacturing companies by exploring environment–strategy configurations. *Industrial Marketing Management*, 37(3), 278-291.
- Hedman, J., & Kalling, T. (2003). The business model concept: theoretical underpinnings and empirical illustrations. *European Journal of Information Systems*, 12(1), 49-59.
- Kowalkowski, C., Windahl, C., Kindström, D., & Gebauer, H. (2015). What service transition? Rethinking established assumptions about manufacturers' service-led growth strategies. *Industrial Marketing Management*, 45, 59-69.
- Kujala, S., Artto, K., Aaltonen, P., & Turkulainen, V. (2010). Business models in project-based firms–Towards a typology of solution-specific business models. *International Journal of Project Management*, 28(2), 96-106.
- Lenka, S., Parida, V., Sjödin, D. R., & Wincent, J. (2017). Exploring the microfoundations of servitization: How individual actions overcome organizational resistance. *Journal of Business Research*.
- Martinez, V., Leseure, M., Bastl, M., Kingston, J., & Evans, S. (2010). Challenges in transforming manufacturing organisations into product-service providers. *Journal of Manufacturing Technology Management*, 21(4), 449-469.
- Matthyssens, P., & Vandenbempt, K. (2008). Moving from basic offerings to value-added solutions: Strategies, barriers and alignment. *Industrial Marketing Management*, 37(3), 316-328.
- Matthyssens, P., & Vandenbempt, K. (2010). Service addition as business market strategy: identification of transition trajectories. *Journal of Service Management*, 21(5), 693-714.
- Ng, I. C. L., & Nudurupati, S. S. (2010). Outcome-based service contracts in the defence industry – mitigating the challenges. *Journal of Service Management*, 21(5), 656-674.
- Nordin, F., Kindström, D., Kowalkowski, C., & Rehme, J. (2011). The risks of providing services. *Journal of Service Management*, 22(3), 390-408.
- Nudurupati, S. S., Lascelles, D., Wright, G., & Yip, N. (2016). Eight challenges of servitisation for the configuration, measurement and management of organisations. *Journal of Service Theory and Practice*, 26(6), 745-763.
- Raddats, C., & Kowalkowski, C. (2014). A Reconceptualization of Manufacturers' Service Strategies. *Journal of Business-to-Business Marketing*, 21(1), 19-34.
- Reim, W., Parida, V., & Örtqvist, D. (2015). Product–Service Systems (PSS) business models and tactics – a systematic literature review. *Journal of Cleaner Production*, 97, 61-75.
- Reim, W., Parida, V., & Sjödin, D. R. (2016). Risk management for product-service system operation. *International Journal of Operations & Production Management*, 36(6), 665-686.
- Sousa, R., & Silveira, G. J. C. d. (2017). Capability antecedents and performance outcomes of servitization: Differences between basic and advanced services. *International Journal of Operations & Production Management*, 37(4), 444-467.
- Ulaga, W., & Loveland, J. M. (2014). Transitioning from product to service-led growth in manufacturing firms: Emergent challenges in selecting and managing the industrial sales force. *Industrial Marketing Management*, 43(1), 113-125.
- Ulaga, W., & Reinartz, W. J. (2011). Hybrid offerings: how manufacturing firms combine goods and services successfully. *Journal of Marketing*, 75(6), 5-23.
- Windahl, C., & Lakemond, N. (2010). Integrated solutions from a service-centered perspective: Applicability and limitations in the capital goods industry. *Industrial Marketing Management*, 39(8), 1278-1290.
- Yin, R. (2014). *Case study research: design and method* (Fifth ed.): Los Angeles : SAGE.
- Zarpelon Neto, G., Pereira, G. M., & Borchardt, M. (2015). What problems manufacturing companies can face when providing services around the world? *Journal of Business & Industrial Marketing*, 30(5), 461-471.
- Zhang, W., & Banerji, S. (2017). Challenges of servitization: A systematic literature review. *Industrial Marketing Management*, 65, 217-227.