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Towards a multi-level servitization framework: Conceptualizing ambivalence in manufacturing firms

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Abstract

Purpose – The dominant-view within servitization literature presupposes a progressive transition from product to service orientation. In reality, however, many manufacturing firms maintain both product and service orientations throughout their servitization journey. Using the theoretical lens of organizational ambivalence, this paper explores the triggers, manifestation and consequences of these conflicting orientations.

Design/methodology/approach – A multiple case study method was used to analyse five large manufacturing firms that were engaged in servitization. Semi-structured interviews were conducted with 35 respondents across different functions within these firms.

Findings – Servitizing firms experience organizational ambivalence during servitization because of co-existing product and service orientations. This paper provides a framework that identifies the triggers of this ambivalence, its multi-level manifestation and its consequences. These provide implications for explaining why firms struggle to implement servitization strategies due to co-existing product and services orientations. Understanding organizational ambivalence, provides opportunity to manage related challenges and can be vital to successful servitization.

Originality/value – Considering the theoretical concept of ambivalence could advance our understanding of the effects and implications of conflicting orientations during servitization in manufacturing firms.

Keywords – Servitization, Ambivalence, Multi-level, Organizational ambivalence, Service orientation, Challenges, Managing, Product-Service Systems, Solutions, Integrated solutions

Paper type – Research paper

1. Introduction

Servitization, the trend whereby manufacturing firms offer increasingly advanced services, is becoming an important topic of enquiry (Vandermerwe and Rada, 1988; Ulaga and Reinartz, 2011, Bastl *et al.*, 2012; Kohtamäki *et al.*, 2013; Lightfoot *et al.*, 2013; Smith *et al.*, 2014; Raddats *et al.*, 2016; Baines *et al.*, 2017). A servitization strategy is believed to allow manufacturing firms to increase customer satisfaction and loyalty and achieve competitive advantage (Baines *et al.*, 2009; Durugbo and Erkoyuncu, 2016). However, despite the well-documented importance of servitization as a strategy for manufacturing companies, most firms still struggle to operationalize and execute such a strategy (Lightfoot *et al.*, 2013; Kowalkowski *et al.*, 2015).

Servitization studies have predominantly focused on the journey of servitizing firms along a unidirectional, progressive product-to-service continuum. This view assumes that manufacturing firms tend to transform from offering basic services to providing services of advanced nature, ultimately becoming full-scale providers of solutions or functions (Oliva and Kallenberg, 2003; Matthyssens and Vandenbempt, 2010). Consequently, servitization research has primarily centred on identifying and overcoming challenges to help product-oriented firms become more service oriented (Gebauer and Kowalkowski, 2012; Ulaga and Loveland, 2014; Raddats *et al.*, 2016; Coreynen *et al.*, 2017). While valuable knowledge has been developed in these areas, recent studies have begun to highlight servitizing firms' enduring tendency to focus on their product-oriented business in parallel with their growing service-oriented business (Storbacka *et al.*, 2013; Kowalkowski *et al.*, 2015). The co-existence of product and service orientations is difficult to maintain because these orientations are naturally contradictory. Product-based businesses must focus on efficiencies and standardization, which contradicts the heterogeneity and flexibility that are required to run a service business (Bowen *et al.*, 1989). Effectively handling these co-existing orientations, which results in conflicting agendas and opposing goals, represents a major challenge. Understanding this issue could largely explain successful and unsuccessful servitization implementation (Windahl and Lakemond, 2010; Storbacka *et al.*, 2013; Kowalkowski

et al., 2015; Kowalkowski *et al.*, 2017). Nonetheless, few studies have addressed this critical aspect of servitization (Kowalkowski *et al.*, 2017).

In this study, we apply the theoretical lens of ambivalence – i.e. attraction to desirable yet contradictory alternatives (Larson and Tompkins, 2005, Ashforth *et al.*, 2014) – to provide a novel perspective that furthers our understanding of co-existing orientations during the servitization process. In this case, firms are drawn towards conflicting product and service orientations. Prior research reports ambivalence in organizational settings where there are internal conflicts, oppositions, paradoxes and dualities (Piderit, 2000; Ashforth *et al.*, 2014) such as those experienced during servitization. More importantly, research has shown that ambivalence can lead to positive consequences such as enhanced creativity and nuanced decision making (Fong, 2006; Pratt and Pradies, 2011) and negative consequences such as behaviour vacillation, resource waste and doubt, uncertainty and indecisiveness within the organization (Weigert and Franks, 1989; Pratt and Doucet, 2000). In the servitization literature, some studies have identified dualities, conflicts, oppositions and paradoxes during servitization (Brax, 2005; Finne *et al.*, 2013; Sjödin *et al.*, 2016; Einola *et al.*, 2016). However, few have investigated how these tensions affect the organization and what implications they have during servitization. The theoretical lens of ambivalence enables the study of the conflicts that emerge during servitization and may provide insights into the way these issues manifest themselves and affect servitizing firms.

Against this backdrop, the purpose of this study is to investigate how servitizing firms manage co-existing product and service orientations. Empirical insights were drawn from case studies of five leading manufacturing firms that were engaged in the servitization process. Based on these insights, we contribute to servitization theory and practice in several ways. First, by identifying ambivalence during servitization, we provide a novel theoretical framework to explain the challenges and consequences of organizational ambivalence in manufacturing firms during servitization. More specifically, we develop a servitization framework based on ambivalence theory to explain the triggers, manifestation and consequences of co-existing product and service orientations. Second, we provide a new multi-level conceptualization that shows how ambivalence manifests itself at different organizational levels. More specifically, we provide empirical evidence that ambivalence manifests itself at strategic, tactical and operational levels. Third, we detect positive and negative consequences that arise from this ambivalence. These are novel insights into the complex dynamics of organizational ambivalence during servitization.

In section 2, we review the broader theoretical background on servitization in industrial manufacturing firms and ambivalence. In section 3, we outline the methods and data analyses. In section 4, we present the findings, and in section 5, we develop a framework of ambivalence and its consequences. In section 6, we discuss theoretical and practical implications and suggestions for future studies.

2. Theoretical background

2.1. Servitization and co-existing product and service orientations

In the servitization literature, scholars broadly assume that manufacturing firms follow a unidirectional transformational path along a product-to-service continuum (Oliva and Kallenberg, 2003; Brax, 2005; Baines *et al.*, 2009; Parida *et al.*, 2014; Smith *et al.*,

2014; Reim et al., 2016). For example, Oliva and Kallenberg (2003, p. 161) state that manufacturing firms move from offering simple product-support services to more advanced solutions and transform “from being a product manufacturer into a service provider”. However, few manufacturing firms actually traverse this unidirectional continuum to become service providers overnight. Most manufacturing firms continue to focus on product and service offerings for an extended period during servitization (Storbacka et al., 2013; Kowalkowski et al., 2015). This emerging view questions the existing assumptions regarding the challenges of unidirectional transition. Under this emerging view, a major challenge for manufacturing firms is not abandoning their product orientation to become a service firm but rather understanding and managing the challenges of conflicting product and service orientations (Windahl and Lakemond, 2010; Kowalkowski et al., 2015). Despite recent acknowledgment of this view, few studies have investigated the focus on conflicting orientations.

The servitization literature contains various conceptualizations of product and service orientation. Oliva and Kallenberg (2003) define service and product orientation in terms of the firm’s position on the product-to-service continuum. At the product end, products or tangible goods are more important, whereas at the service end, services are more important. The focus on customer interactions at the product end is transactional, whereas the focus at the service end is relational. A firm’s position on this continuum indicates whether that firm is more product oriented or more service oriented. Service orientation has also been conceived as the number of services offered, the number of customers to whom these services are offered (breadth) and how actively the services are offered to customers (emphasis) (Homburg *et al.*, 2002). Bowen *et al.* (1989) differentiate between service and product orientation in terms of prototypical characteristics. A product orientation involves tangible and standardized outputs, low customer involvement, and separation of production and consumption characteristics; a service orientation implies characteristics of intangible and customized outputs, greater customer involvement, and simultaneous production and consumption. In this study, we conceptualized firms’ product and service orientation based on the relative focus that firms placed on products or services. We gauged this relative focus by the number of offerings and the nature of these offerings in terms of standardization or customization, as well as and the depth and breadth of the firm’s relationships with customers.

Servitization scholars have emphasized the distinct and contradictory nature of product and service orientations, arguing that different capabilities are needed in either case (Bowen *et al.*, 1989; Paiola *et al.*, 2013; Ulaga and Loveland, 2014). Accordingly, challenges during servitization primarily relate to overcoming a product orientation and developing capabilities to move towards a service orientation. Many scholars have studied these challenges for various aspects of manufacturing firms during servitization, including organizational values (Bowen *et al.*, 1989), business models (Ferreira *et al.*, 2013), organizational structures (Gebauer and Kowalkowski, 2012), capabilities (Paiola *et al.*, 2013) and sales (Ulaga and Loveland, 2014). Under the aforementioned emerging view, however, the co-existence of conflicting product and service orientations, along with their management, presents a key challenge during servitization (Windahl and Lakemond, 2010; Storbacka *et al.*, 2013; Kowalkowski *et al.*, 2015). Research also suggests that co-existence of conflicting product and service orientations lead to dualities, contradictory goals and opposing pressures because the firm tries to manage and perform well in both areas (Morcos and Henshaw, 2009). Thus,

whilst the co-existence of these conflicting orientations is a reality for manufacturing firms that are engaged in servitization, our knowledge about this situation is limited.

2.2. *Ambivalence and its implications for servitization*

Ambivalence theory offers an interesting approach in the context of servitization. It suggests that when contradictory goals or pressures exist in an organization (e.g., co-existing product and service orientations), actors experience ambivalence because they have a positive orientation towards both conflicting alternatives (Piderit, 2000; Ashforth *et al.*, 2014). Although it should be understood as a complex, multifaceted concept, ambivalence literally refers to simultaneously experiencing two opposing forces. Ambivalence has primarily been applied in social psychology, but it has recently been introduced – with notable consequences – in strategic and operational management. Ambivalence has often been referred to as simultaneous positive and negative orientations to an object (Piderit, 2000; Ashforth *et al.*, 2014). In the organizational context, ambivalence has been described as being pulled in different directions or being torn between conflicting impulses. In this study, we adopted Larson and Tompkins's (2005, p. 11) definition of organizational ambivalence as “the experience of being drawn towards desirable yet contradictory alternatives”.

Although ambivalence in organizations has scarcely been studied, recent studies have identified the manifestation and consequences of ambivalence in business settings (Larson and Tompkins, 2005; Wang and Pratt, 2008). In fact, ambivalence may be common in servitization because of complexities and dynamism in the environment that give rise to contradictory goals, role conflicts, dualities and multifaceted objects (Ashforth *et al.*, 2014). For example, in servitization, role conflicts and ambiguities arise from the simultaneous set of pressures that make product-oriented demands incompatible with service-oriented ones (Sjödén *et al.*, 2016). The emergence of contradictory goals within an organization during servitization is also common (Finne *et al.*, 2013). The ambivalence literature has shown that these kinds of contradictory goals and role conflicts lead to situations in which behavioural and attitudinal expectations are incompatible, which gives rise to oppositions – namely, when a demand for A is juxtaposed with a demand for not-A (Ashforth *et al.*, 2014). Research has also shown that in paradoxical situations like those that arise during servitization (Brax, 2005; Einola *et al.*, 2016), oppositions and tensions are commonly experienced. In such situations, the meaning of events is open to interpretation, and stakeholders exert numerous, fundamentally conflicting demands. Such situations encourage the contextual root of oppositions and the emergence of ambivalence (Piderit, 2000; Ashforth *et al.*, 2014). Therefore, it is important to understand how organizations in such settings experience ambivalence and cope with contradictions as they endeavour to advance in a coherent manner.

Ambivalence is an unpleasant, discomfoting experience. Organizational actors are often compelled to deal with ambivalence. They do so in various ways (Pratt and Doucet, 2000). The ambivalence literature suggests that the feeling of being torn between two desirable yet contradictory alternatives can create doubt in actors' minds. This feeling also causes indecision, which can lead to negative behavioural consequences such as vacillation, whereby actors repeatedly switch between two desirable alternatives, and the inability to adapt to environmental changes (Westenholz, 1993, Weigert and Franks, 1989; Pratt and Doucet, 2000). On the other hand, ambivalence has also been shown to have many positive consequences. For example, actors become more receptive to alternatives, thereby improving the accuracy of their

judgments (Rees *et al.*, 2013). They also show stronger organizational commitment, greater creativity and more nuanced decision making whilst experiencing ambivalence (Pratt and Rosa, 2003; Fong, 2006; Pratt and Dirks, 2006; Pratt and Pradies, 2011). Accordingly, ambivalence may also have positive effects on servitization. Although these studies refer to the manifestation and consequences of ambivalence in organizations, the literature on ambivalence in the organizational context is still in its infancy. Ambivalence and its related constructs promise to provide a new theoretical lens through which to examine the challenges and consequences of organizational servitization.

3. Method

3.1. Research approach

We adopted an exploratory case study research design because we sought to obtain a rich dataset and detect the underlying dynamics of the target phenomena (Eisenhardt, 1989; Siggelkow, 2007). This approach is suitable when limited data are available and the goal of the study is to build theory, which was our case (Barrat *et al.*, 2011; Yin, 2003). We applied purposive sampling to select five large manufacturing firms. These companies were chosen for several reasons. Each had defined a clear vision, explicitly implemented a servitization strategy and become a front-runner in its industry. Prior interactions with these firms also showed that in their present state of servitization, they had co-existing product and service orientations. Finally, to increase variation within the sample, we selected firms that operated in different manufacturing industries. Table 1 details the background of our case companies and the interviews that were conducted for this study.

>>>>>>Insert Table 1 about here. <<<<<<<

3.2. Data collection

Data were gathered primarily through in-depth interviews. Interviewing on site helped respondents provide insightful information and focus directly on the research topic (Yin, 2003). We conducted 35 interviews with respondents at all organizational levels (Parida and Chattopadhyay, 2007). The empirical study was conducted in two steps. During Step 1, we conducted 12 interviews that focused on understanding the firms' servitization strategy, including vision for the future, key ongoing efforts in different organizational units, and views on the underlying conflict between co-existing product and service orientations. During Step 2, we conducted 23 additional interviews that focused on the firms' servitization-related challenges and the consequences of these challenges. To capture broad as well as detailed insights, we interviewed respondents from strategic, tactical and operational levels. The respondents also belonged to various units, including R&D, production, marketing, sales and distribution, and regional units. These units were chosen because they were actively involved in developing and implementing servitization-related efforts.

To ensure reliability, multiple researchers conducted the interviews. So, that the authors could ensure overlap between data collection and data analysis, frequent discussions were held. The authors also kept a regular log of field notes. Secondary data were collected from archive materials. Sources such as websites, internal documents and published materials were used during the two-step process. Data from these sources were analysed to build case knowledge, validate findings and triangulate empirical data.

3.3. Data analysis

First, we tried to elicit as many informant terms and codes as possible in each of our cases. Doing so helped us detect emerging constructs and the possible relationships between these constructs (Gersick, 1988; Pettigrew, 1990). This was followed by cross-case analysis, where we used constant comparison techniques (Strauss and Corbin, 1990) to identify relevant patterns from the initial descriptions and codes. Thus, our cross-case analysis progressed through a series of iterations, which built on differences and commonalities between first-order categories, second-order themes and aggregated dimensions (Van Maanen, 1979; Nag *et al.*, 2007). Despite its iterative nature, our analysis procedure can be viewed to emerge in distinct steps.

The first step was in-depth analysis of informant terms and codes to identify possible similarities and differences amongst them (Nag *et al.*, 2007). We thus discerned the codes for our first-order categories from common words, phrases and labels that the respondents used. Next, we sought links and patterns amongst the first-order categories. This iterative process helped us formulate theoretically distinct second-order themes by combining the first-order categories. We identified nine themes related to organizational ambivalence and its consequences. Finally, we defined overarching dimensions that represented a third level of abstraction in the coding. These third-order dimensions were built on the first-order categories and second-order themes to present a theoretically and practically grounded categorization. To ensure rigor and increase confidence in our analysis and the assigned codes, multiple researchers developed the coding scheme independently. In the event of a disagreement or difference, we discussed and modified the coding scheme until a consensus was reached. Finally, we compared the text passages and ensured that the data were represented correctly.

These steps enabled us to develop an empirically driven theoretical framework to describe the links between the phenomena that emerged in the data analysis. Figure 1 presents the emergent data structure of our analysis process.

>>>>>>Insert Figure 1 about here. <<<<<<

4. Findings

4.1. Triggers of ambivalence during servitization

Respondents provided several examples of how their firms manage the conflicts that arise from simultaneous product and service orientations. The co-existence of two desirable yet opposing orientations creates many tensions and conflicts that lead to organizational ambivalence. As a portfolio manager in one firm explains, “We are all aligned with the new service focus of our company. However, we also have our existing business that is our bread and butter. We cannot neglect it too.” In another case, an R&D manager reports the following: “In our unit, we are trying to develop new solutions [service offerings], but we are also obliged to keep the funnel of our product offerings robust as well.” These views show that organizational actors feel torn towards both product- and service-oriented initiatives, thereby showing the existence of ambivalence within the firms in this study.

4.2. Manifestation of multi-level organizational ambivalence during servitization

Further analysis revealed evidence of a multi-level manifestation of ambivalence within the firms in this study (Figure 1). To discuss the different forms of ambivalence that

were reported by respondents, the following subsections present empirical evidence for all levels of ambivalence.

4.2.1. Strategic ambivalence due to opposing product and service directions

Ambivalent strategies manifest themselves at the top level of the firms in this study. This form of ambivalence emanates from the opposing product and service directions in such firms, with their contradictory goals and directional conflicts.

First, product-dominant traditions enforce organizational inertia towards developing a service strategy, implying that the dominant product tradition drives strategic thinking and decision making. This situation is especially problematic because in service-related strategic thinking and actions, top managers tend to be driven predominantly by their pre-existing product-oriented thinking. Although they wish to drive their service businesses forward, the inertia of their dominant product orientation pulls them in another direction. For example, a technology development director in one firm remarks the following:

“We want to continue building new and more advanced products because that is what we know, and we are good at it. But we also understand that service business is critical for our future survival. But when top management teams interact and make key decisions, it is quite visible that many members struggle to accept change in our strategic orientation towards service business”

Second, at the strategic level, there is significant ambivalence in the simultaneous push for transactional and relational business models. The core idea of a product-related business is to sell the product and generate revenue from a transaction-based business model. In contrast, a solution business requires the supplier to continue the relationship with the customer long after the transaction is complete to build a relationship-based business model. When these divergent business models co-exist, however, they create internally conflicting goals. As many respondents stress, this approach proves counterproductive, creating significant uncertainty regarding which goal to focus on. One senior manager reports the following:

“Focus on value generation over time means taking a relational perspective on our customers. So, we are realizing that the business models have to evolve or change. Because we are such a large global organization, however, we have to continue with the product business but slowly move to the service business. Not being able to make the change quickly created lot of problems internally as we are working with old and new business models.”

4.2.2. Tactical ambivalence caused by misaligned product and service processes

There is more evidence of ambivalence when strategic directives are operationalized at a lower organizational level. Many instances of ambivalence are due to misaligned product and service processes.

Typically, the operational processes of the firms in this study are geared towards maximizing the standardization and efficiency that is required when selling products. When selling services, however, the operational processes must be geared towards customization and flexibility to address individual customer needs (i.e., greater emphasis on relational and co-creation behaviour). Therefore, ambivalence results from

unclear prioritization of exploiting existing product-based processes or addressing unique customer needs. The firms in this study did not have a clear view on prioritization between focusing on exploiting efficient product-oriented processes and developing more flexible processes to meet individual customer needs. These conflicting needs create tensions and increase actors' feelings of ambivalence at the tactical level. Several statements from our respondents reflect this phenomenon. For example, a service researcher notes the following:

“In the past, the development unit would get requirements from the front-line staff, and they would develop a vision of certain product features, and then they would go and implement those product features. Now, to deliver services, especially with the software, there is a need for more direct feedback loops in terms of ready-to-deliver features that can be demonstrated to front-line staff and front-line staff can demonstrate to customers. So, it [the development process] has become more dynamic.”

In addition, because the organizations have co-existing product and service orientations, specific processes are needed to operationally support the two orientations within the firm. However, respondents report considerable attraction to existing product benchmarks whilst developing processes to support new service development and delivery. In particular, the firms in this study tend to draw upon the existing product-oriented processes for inspiration. Therefore, they constantly struggle to advance with new service processes because of their resistance to breaking away from familiar processes. For example, respondents from several firms report that to drive new solution development, product-based decision-support systems are used to make go/no-go decisions, even though they are not suitable for evaluating solutions. As a global portfolio manager explains:

“Providing integrated products and services can be very tricky. How can we combine two such completely different processes? What component is going to provide which part of the value? And then, when we combine them, we might have to look at the product and services very differently as they might be playing a very different or changed role as when they were just the individual product or service. And, of course, [there's the question of] what approach to use, the product approach or the service way of doing things?”

4.2.3. Operational ambivalence caused by unclear scripts for performance

At the operational level, groups and teams in particular experience ambivalence in servitization when they have conflicting objectives, skillsets and incentives. Respondents in this study report considerable ambivalence in group and team performance, especially because actors struggle with limited skillsets and opposing incentives.

Respondents note that technical roles and responsibilities have traditionally been at the forefront of their product orientation. Therefore, pride and recognition are directed towards advanced technical knowledge and skills. In servitization, however, technical know-how is relegated to the background. Instead, softer customer-oriented roles and responsibilities, especially those associated with relational process development and life-cycle integration, become the focus. These are very different roles from those in the technology-based product-oriented business. For example, product-based teams are

also involved in new service/solution development because it requires broad skills and cross-functional knowledge to support development efforts. In such situations, the teams experience ambivalence because they are torn between their familiar product roles and responsibilities, in which they excel, and their newly assigned service development roles and responsibilities, in which they struggle to meet expected performance levels. Thus, their product-focused roles and responsibilities limit their performance in service businesses. This situation is described by a service manager at one firm:

“Several new positions have been created recently to effectively pursue an industrial service strategy within our unit. But what the responsibilities for driving service business [are] remain unclear. This has resulted in several ongoing projects with insufficient internal support and structure.”

Another example of ambivalence at the operational level emerges in the context of performance indicators that are not aligned with the firms’ service orientation objectives. Generally, organizational service objectives are aligned with the strategic vision of providing new services, and these objectives are tracked through a performance-measurement system. Indicators in performance-measurement systems need to be measurable and quantifiable to objectively assess job performance. However, service-oriented indicators are difficult to quantify and measure; in fact, they are usually excluded from the existing performance-measurement systems. Accordingly, the most measurable and quantifiable product-oriented indicators become the predominant indicators in the performance measurement systems. For example, developing an in-depth understanding of customers’ businesses, maintaining good customer relationships and realizing long-term value are important aspects of building a service orientation. However, measuring these soft parameters is difficult. Therefore, quantifiable, measureable product-oriented indicators such as unit sales, registered patents and newly acquired customers continue to be used in performance-measurement systems. Groups and individuals feel ambivalent towards focusing on generating relational value – as per the firm’s strategic objectives for adopting a service orientation – and focusing on targets – as per the measurable product-oriented indicators in the firm’s performance-measurement system. A service portfolio manager from a case firm clearly explains this issue:

“In our company, we follow a very structured approach to measure personnel development. They have been created for an organization that intends to sell physical products. However, as we expand services, new measurements have to be introduced to keep individuals motivated to follow the new strategic focus; otherwise, there will be a misalignment.”

4.3. Consequences of organizational ambivalence during servitization

During servitization, ambivalence is widespread at all levels. According to ambivalence theory, when ambivalence manifests itself in a firm, it may lead to positive and negative consequences. Several consequences result from ambivalence in the organization during servitization. In the following sub-section, we elaborate on the positive and negative consequences of this organizational ambivalence (Figure 1).

4.3.1. Negative consequences of organizational ambivalence

4.3.1.1. Resource inefficiency

As employees' experience ambivalence and are pulled towards opposite orientations, teams and individuals are faced with multiple authorities as well as differing directions. When competing and conflicting forces are operational within an organization, such as in the firms in this study, there is pressure on available resources. The organizational actors in this study struggle to choose and control resources that pull them in different directions. This leads to the dispersion of effort and the spread of focus, which prevents the actors from accomplishing their goals. The result is lower resource efficiency within the firms in this study. As one director observes:

“We can't expect that our solutions business will achieve their targets, but still we have to invest money there and try and push forward...of course, our product business suffers, but it's a choice we have made.”

4.3.1.2. *Dilution of accountability*

Conflicting goals and pressures emerge as multiple sources of command and expectations within the organization, creating an ambivalent situation for actors. This situation leads to role conflict and confusion regarding the distribution and definition of objectives within the firm. Actors within the firms in this study are also torn between the legal chain of command and emerging collegial authorities, which leads to a dilution of accountability at various levels within the firm. This phenomenon is witnessed within all firms in this study. As one business planner observes:

“All these teams have said yes to working on this [new solutions offering]...for the certain number of hours that has been estimated... On the other hand, [if] the pressure gets high enough to do something else, they go and do that. It's not easy because there are very few people working full time on this project...maybe none. Some are doing 5%, 20%, some are 50%, and so on... It's everyone's job, and it's no one's either.”

4.3.1.3. *Stalled decision making*

Firm managers rely on decision-support systems that guide their decision-making processes (e.g., resource distribution and portfolio management). In these servitizing firms, however, traditional product-oriented decision-making frameworks become less relevant as service-oriented indicators become necessary. These organizations often struggle to find ways to combine product- and service-oriented parameters because the two seem fundamentally incompatible. Additionally, the service-oriented indicators are difficult to quantify objectively, and product-oriented thinking prevents organizations from clearly expressing these indicators. In such situations, there is disagreement over the standards and goals of the decision-support systems. In turn, managers are unable to objectively evaluate their decision options and thus delay decisions until the situation is clearer. For the firms in this study, this type of delay results in a general slowdown and, in many instances, a freeze in decision making. As one director of technology planning reports:

“For our yellow machines, we have a really good business case model, product cost, gross margin models to tell us that if we do this, then this will be our costs, our profits, our entire margins in the value system. Now, when we get into this [solutions offering], we don't have those decision-support models and no decision support, and without those decision-support models, we can't say what is the volume . . . what is the revenue . . . how do we get to it. It does not fit into our decision mechanisms that

we have in our company. So how do we move forward? It's hard to [be motivated] to move forward with decisions regarding our portfolios and business.”

4.3.2. *Positive consequences of organizational ambivalence*

4.3.2.1. *Creative resource optimization*

The servitization process increases pressure on available resources as the product- and service-oriented initiatives pull in opposite directions. The operational teams face a lack of resource commitment from the management. In such situations, the product and service organizations must work closely together to minimize overlapping efforts and find synergies. There is also greater effort to align product- and service-oriented goals and objectives and greater cross-fertilization of competencies and processes that greatly improve efficiency and outputs. New cross-functional platforms and interactive mechanisms emerge, which substantially increases the firms' abilities to optimize their resource usage. As a researcher at one firm recounts:

“If we don't know how they [the product team] have designed the output mechanisms, then we will not be able build the functionalities on top of them. We now only try to extend on what is available instead of starting from scratch. We have developed a new [solutions] development protocol that helps us work together closely without any gap. This way, we can work on more solutions with our small team and also make sure that our products are also part of the final solutions instead of some other third-party vendor's [products].”

4.3.2.2. *Reconfiguration of accountability*

Competing, divergent forces resulting from the co-existence of opposing orientations lead to ambiguity regarding the scope, expectations and description of traditional roles within the organization. These roles must be clarified and redefined to adapt to the new requirements that are placed on the firms during servitization. In many instances, the firms in this study reconfigure accountability by reframing their operational frameworks, changing their performance-measurement systems and undertaking sense-making initiatives. These measures help provide clarity and avoid the vagueness that started to appear when the firms rolled out their servitization initiatives. For example, a director of technology planning explains the following:

“When we started, there was a lot of confusion as we did not know what we were supposed to do...how to deal with the teams and provide support to them. There was a lot of confusion. We had to move a lot of people from other departments to ours and changed their roles and what they worked on so that we could support both our old business and new initiatives. It's a constant struggle but this has helped.”

4.3.2.3. *Proactive decision making*

In ambivalent conditions, there is a general lack of clarity regarding the roles, responsibilities and way forward for individuals and teams. The environment is therefore characterized by ambiguity and mistrust, which affects operational decision-making processes and collaboration between different levels within the firm. In this situation, individuals and groups offer to take responsibility and seek information that can illuminate the way forward. They also push for collaboration amongst teams to develop a consensus and acceptable guidelines and goals for supporting servitization

efforts. Their efforts and initiative drive proactive decision making and support overall servitization initiatives. As a business development manager at one firm recalls:

“We did things here based on if it was necessary for our customers or not. We did not have any knowledge of that [new solutions development] or anyone here to show us what to do. There was nobody here talking about these things [solutions] then. We just experimented and moved forward. We asked around and got the lab [testing and product analysis] guys to help us out and also work with the factory to get the prototypes. If we did not do it, then we probably would not have this solution lab today.”

5. Towards a framework of organizational ambivalence during servitization

Drawing upon empirical insight, we propose a framework of organizational ambivalence during the servitization journey (Figure 2). The proposed framework explains the path that links the triggers, manifestation and consequences of organizational ambivalence. This provides an overview of how the co-existence of conflicting product and service orientations during servitization triggers organizational ambivalence and how ambivalence spreads and affects the organization performance.

The findings support our initial thesis: that contradictory product and service orientations place conflicting demands on organizational norms, roles and other collectively held identities (Wang and Pratt, 2008). In case firms, servitization is characterized by limited resource commitments and emergence of complicated reward systems. As illustrated by our results, the servitization change process also elicits additional insecurities and mixed feelings in actors at all levels of the firm (Piderit, 2000). For example, our results show how oppositions, dualities and paradoxes emerge and trigger ambivalence at different organizational levels (Brax, 2005; Ashforth *et al.*, 2014; Einola *et al.*, 2016).

Ambivalence in servitization manifests itself at all levels of the firm, multiplying as it cascades from the strategic level to the tactical level and finally to the operational level. Organizations are built around a hierarchical relationship that has a single, clear flow from top to bottom (Fayol, 1949). This structure provides top management with effective control and coordination. At the strategic level of the firms in our study, we observed instances of ambivalence in servitization that cascaded down to the lower levels. For example, ambivalence regarding the presence of two conflicting business directions at the strategic level manifested itself at the tactical level – because of the resulting misalignment of product and service processes – and at the operational level – because of unclear performance scripts. As in all organizations, decisions and communication at the strategic level of the firms in this study had ramifications across all functional units within the organization: finance, sales, marketing, HR, R&D, and so on. Each decision or action at the functional unit level spread further, affecting other functional units and ultimately all groups and individuals within the firm. For example, provider 3 adopted a strategy towards offering consulting services as part of the product offering which lead to significant need of changes in processes and capabilities. However, a lack of clear strategic directions lead to insecurities and confusion in sales and marketing operations as teams were using simultaneously new processes and old processes for offering the consulting services along with the products. We observed

that the manifestation of ambivalence multiplied as it moved from the strategic level to the next lower levels, leading to widespread ambivalence at the operational level.

As ambivalence cascaded and multiplied from the strategic to the operational level, we observed both negative and positive consequences, which resulted from actors' responses to this ambivalence (Westenholz, 1993; Pratt and Doucet, 2000; Pratt and Pradies, 2011; Ashforth *et al.*, 2014). Our findings imply that the negative consequences of ambivalence in servitization were related to resource inefficiency, dilution of accountability and stalled decision making, while the positive consequences of ambivalence were creative resource optimization, reconfiguration of accountability and proactive decision making. These contrasting consequences suggest that when actors experience ambivalence, their responses might stifle the organization's effort and scatter resources or, conversely, spark the creativity and resourcefulness that the organization needs to drive servitization. For example, in provider 1, the decision was taken to develop its solutions by recruiting part-time members to solutions development. Although there was some official allocation of their time to the project, they were constantly being pulled back by their supervisors for work in their existing departments. As a result, the solutions development process dragged on for years and after a lot of investment of resources, it was not found suitable to be commercialized. In contrast, provider 2 in the face of conflicting product and service approaches adopted a cross-functional team with people from both product and service development for developing a new solution offering. In this case, the members used their diverse knowledge to design a new solution development process that leveraged on the existing best practices of the product and service departments. The successful development of the solution led to this particular cross-functional process to be a standard operating procedure for all future solutions development in the firm.

To sum up, the servitization research offers an inadequate explanation of the presence and implications of ambivalence in servitizing firms. This framework sheds light on the widespread presence of ambivalence and its consequences. This framework therefore provides explanatory insights into the ongoing struggle and possible remedial measures for firms to implement servitization strategies.

>>>>>>Insert Figure 2 about here.<<<<<<<

6. Discussion and conclusions

6.1. Theoretical implications

This study has several implications for the servitization literature. First, prior studies have predominately focused on the challenges of servitization and the approaches that firms adopt to shift from a product orientation to a service orientation (Baines *et al.*, 2009; Ulaga and Reinartz, 2011; Lightfoot *et al.*, 2013; Smith *et al.*, 2014; Raddats *et al.*, 2016). However, this study responds to calls for greater understanding of simultaneous product and service orientations during servitization (Storbacka *et al.*, 2013; Kowalkowski *et al.*, 2017). This study adds to this existing research by addressing the co-existence of conflicting orientations and its importance in explaining successful or failed servitization attempts (Lightfoot *et al.*, 2013; Kowalkowski *et al.*, 2015). Many servitization studies have identified the presence of oppositions, dualities, conflicts and paradoxes during servitization (Brax, 2005; Finne *et al.*, 2013; Sjödin *et al.*, 2016; Einola *et al.*, 2016), but none has highlighted ambivalence as a key concept for advancing our understanding of the implications of these issues. By examining the

key role of ambivalence, we advance our understanding of servitization in manufacturing firms.

Second, the results show the experience of ambivalence during servitization at different organizational levels (Ashforth *et al.*, 2014) and how it cascades down and spreads throughout the firm. These findings contribute to the discussion in the servitization literature concerning the challenges faced within firms related to the strategic choices of moving from a transactional to a relational business model (Ferreira *et al.*, 2013; Reim *et al.*, 2015), shifting from centralized to decentralized operations (Raddats and Burton, 2011; Gebauer and Kowalkowski, 2012), making procedural changes that intimately involve customers and network partners as co-creators of value (Lenka *et al.*, 2017; Sjödin *et al.*, 2016), and building new capabilities for advanced service development and front-end integration (Paiola *et al.*, 2013; Parida *et al.*, 2015; Sjödin *et al.*, 2016). We introduce this multi-level perspective of ambivalence during servitization and thus provide evidence of the widespread presence and linkages of ambivalence. In doing so, we facilitate development of an inclusive view of the underlying dynamics of servitization. This topic warrants managerial and scholarly attention. Most studies on ambivalence have focused on the context of individuals from a social psychological or philosophical perspective. However, the general understanding of the manifestation and consequences of ambivalence in an organizational context are not well understood (Ashforth *et al.*, 2014). Thus, we also contribute to the ambivalence literature by conceptualizing ambivalence at higher levels of aggregation in an organizational setting and by highlighting the consequences of servitization at each organizational level.

Third, we provide in-depth insights into the consequences of ambivalence during servitization, an issue that is scarcely discussed in the literature. Consistent with theory, the study provides evidence of both positive and negative consequences of ambivalence (Westenholz, 1993, Pratt and Doucet, 2000; Fong, 2006; Pratt and Pradies, 2011; Rees *et al.*, 2013). These insights portray ambivalence during servitization as a double-edged sword. Firms can either become unresponsive and scatter precious resources or respond efficiently and creatively to the change that servitization forces upon them. Indeed, the contradictory nature of different responses to similar events opens up the dialogue for novel approaches to manage servitization transformational challenges. For example, one such measure might be structuring performance measurement systems to promote the adoption of responses that yield positive outcomes during servitization.

Lastly, our framework provides an overview of the triggers, manifestation and consequences of ambivalence during servitization. The framework captures the entire path – from emergence to consequences (via manifestation) – of ambivalence during servitization. The literature offers little information on this issue. The framework helps clarify how ambivalence manifests itself and spreads through the organization. The framework thereby establishes ambivalence as a significant phenomenon that has received scarce attention in the literature. It also provides insights into how ambivalence and its implications could explain a firm's struggle to adopt a servitization strategy. Thus, the challenges that relate to co-existing product and service orientations are an important part of the dialogue in servitization research. Ambivalence, along with its consequences, during servitization provides new insights to aid our understanding of the servitization process. These insights could have major implications for managers, as well as providing interesting opportunities for future research.

6.2. *Managerial implications*

The present study has several implications for managers who are engaged in servitization. First, recognizing the manifestation of ambivalence and its consequences during servitization could lead to new approaches to the implementation of servitization strategies. Awareness of ambivalence therefore gives managers the opportunity to identify and adopt an appropriate strategy within the firm. Recognizing ambivalence early would help managers adopt the right tactics. By doing so, managers could minimize the actions that lead to negative consequences and thus help accomplish the desired servitization goals. Managers could also use the awareness of ambivalence to encourage actions that lead to positive consequences during servitization. Understanding the consequences of ambivalence is especially important for managers in leadership positions. These managers can use their agency and discretion to design policies and processes to push for responses that trigger positive consequences. Overall, managing ambivalence during servitization – that is, recognizing ambivalence and adopting appropriate response tactics – is important for managers because it can help the firm successfully navigate the servitization process. Nevertheless, managers must realize that ambivalence is a double-edged sword that needs to be wielded with care to deliver the desired results. If mishandled, it can lead to undesirable consequences.

6.3. *Limitations and future research*

The present study is based on case studies of large manufacturing firms. Therefore, our findings should be seen as initial hypotheses that require testing using confirmatory approaches. Second, ambivalence leads to both positive and negative consequences, so it would be interesting to understand how such outcomes interact within the firm and how this interaction affects overall servitization performance. Although we provide evidence of the manifestation of ambivalence in the firm, we do not know the intensity of this ambivalence. According to ambivalence theory, the degree of ambivalence affects responses to ambivalence, so it would be interesting to seek ways of measuring its intensity. Research into how the degree of ambivalence affects the nature of its consequences would be an interesting avenue for future research. Finally, contextual factors such as top management commitment and the extent of global operations could influence the degree of ambivalence in servitizing firms. Future studies to understand or measure the impact of these factors on ambivalence and its consequences could advance our understanding of how to manage ambivalence during servitization.

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