Hunters and Farmers: Unpacking the Silo Syndrome of Product-Service Business Units

Abstract

Industrial firms are increasingly servitizing their offerings by bundling products and services into solutions. This paper argues that a critical factor in the success of servitization is to structurally separate service and product business units. Yet, an integration that is close fitting and cross functional is also required since two businesses share resources and knowledge to a marked degree. This study explores the concept of functional 'silos' using pragmatic knowledge boundaries since they constrain the flow of knowledge between business units and contribute to the alienation of the units. Anchored in the empirical study of 10 subsidiaries of a major capital equipment provider, the findings of this study suggest that the product-service business unit silos are driven by the following *alienation devices*: the pricing process, the sales process, the installed-base factors, and the measurement process. While structural separation enables the service business to grow, it creates, at the same time, pragmatic knowledge boundaries around business units directly constrain the flow of knowledge and cross-functional integration. On the other hand, this study identifies two important *collaboration devices* in the context of servitization: a unified market approach and long-term customer orientation. First of all, senior leaders need to formulate a business unit strategy that is aligned with the corporate strategy and to put in place overarching performance metrics that will dictate priorities and resolve any situations where businesses are seen to act in opportunistic ways. Second, when senior leaders identify the long-term benefit of the customer as a key driver for the firm and transparently present the product and service options to the customer, knowledge flows between business units are enhanced.

Keywords: servitization, business unit silos, pragmatic knowledge boundaries

1. Introduction

Many industrial firms seek to improve their competitiveness by bundling products and services in order to create more customer-centric solutions (Kowalkowski, Gebauer, Kamp, et al., 2017). A number of leading industrial firms, such as ABB, Atlas Copco, Caterpillar, Rolls-Royce, and Siemens, have focused on growing their service businesses, which were historically driven by the after-sales spare-parts model, in order to provide comprehensive solutions or service contracts where firms guarantee the availability and reliability of their equipment (Visnjic et al., 2017). In doing so, firms need to make appropriate choices concerning organizational design (Galbraith, 2002; Gebauer et al., 2010; Raja et al., 2018). In this respect, mainstream research emphasizes the importance of creating structurally separate stand-alone service business units in order to allow service-specific capabilities, goals, and processes to emerge (Davies et al., 2006; Gebauer et al., 2005; Oliva et al., 2012). It is claimed that a structurally separate service business is a necessity in order to "protect [an] emerging service culture from the dominating manufacturing culture" (Oliva, Gebauer, & Brann, 2012: 4).

Prior research suggests that cross-functional integration is crucial between highly interdependent departmental functions such as marketing, sales, and research and development (R&D) (Ernst et al., 2010; Kahn, 1996), mostly in the context of new product development processes (Sherman et al., 2005; Souder, 1988). Research shows that there are two main categories of integration: an *interaction approach* that depicts the transactional and formal nature of integration based on communication; and the *collaboration approach* that views integration "as an affective, volitional, mutual/shared process where two or more departments work together, have mutual understanding, have a common vision, share resources, and achieve collective goals" (Kahn 1996, p. 139). In order to derive full benefit from bundling products and services, a tight cross-functional collaborative approach across the business units is required (Visnjic Kastalli et al., 2013). Given the imperative to structurally separate business units, firms need to embed the "coordination of processes without the tight coupling of organizational structures" (Sanchez and Mahoney, 1996).

However, industrial firms face major challenges in seeking to integrate manufacturing-related and service-related resources and knowledge (Santamaría et al., 2012). Research points to the great difficulty in integrating business units, whilst concurrently holding the product and service business units accountable for their own individual objectives (Auguste, et.al, 2006). The co-existence of such product and service orientations often triggers organizational ambivalence (Ashforth et al., 2014; Lenka et al., 2018). There are several situations where a product-services set-up leads to business unit alienation or even organizational conflicts. For instance, product sales may leverage on after-sales service support but, in the long run, the successful delivery of such services will postpone a new product purchase (Visnjic Kastalli et al., 2013). Similarly, product sales with indirect sales channels may work in favor of the product business unit but, in the long run, it directly militates against service business unit potential. Consequently, management decisions have dichotomous effects on the particular business unit performance (Tsai, 2002).

The knowledge-based view (Grant, 1996) explores the crucial role of knowledge flows in cross-functional integration (Sherman et al., 2005). It is argued that products and services included in the solution are associated with a number of knowledge components that need to be integrated (Henderson and Clark, 1990; Valtakoski, 2017). Yet, business units create pragmatic knowledge boundaries around their practices and interests (Carlile, 2002, 2004). Pragmatic framing is usually the main constrain acting on the flow of knowledge between business units (Carlile, 2002; Coradi et al., 2015). Moreover, "pragmatic framing of knowledge highlights the

negative consequences that can arise given the differences and dependencies at a boundary". In turn, such interest-oriented behavior can lead to the formation of a functional 'silo' (Sherman and Keller, 2011).

This study focuses on two interdependent objectives. First, it seeks to unpack the factors that generate business-unit pragmatic boundaries and lead to the creation of functional 'silos', where each discrete business unit attempts to maximize its own specific performance goals rather than the overarching objectives of the firm. Second, our study aims to investigate the effective cross-functional integration mechanisms in the context of product-service business units. We explore 10 subsidiaries of a leading multinational capital-equipment manufacturer. In all subsidiaries, product business units and service business units were structurally separated from each other with a subsidiary CEO acting as an integration point (Tushman et al., 2011).

Current findings suggest that the product-service business-unit silos are driven by the following *alienation devices*: the pricing process, the sales process, the installed-base factors, and the measurement process. While structural separation enables the service business to grow, at the same time, it creates pragmatic knowledge boundaries around business units and fuels conflict. Additionally, factors associated with business-unit pragmatic-framing creation directly constrain the flow of knowledge and cross-functional integration. On the other hand, research has identified two important *collaboration devices* in the context of servitization: the unified market approach, and long-term customer orientation. First, senior leaders need to set a business unit strategy that is aligned with the corporate strategy and put in place overarching performance metrics that will dictate the priorities and resolve any situations where business units are seen to act in opportunistic ways. Second, when senior leaders identify the long-term benefit of the customer as a key driver for the firm and transparently present the product and service options to the customer, knowledge flows between the business units are enhanced.

This study contributes to the servitization literature and cross-functional integration in the context of product-service business units. First, the notion of functional 'silos' using pragmatic framing at the business-unit level is explored (Carlile, 2002). Structural separation establishes boundaries since business unit knowledge is localized and embedded in the practices of the business units (Carlile, 2002). Consequently, such boundaries create negative consequences since they effectively obstruct collaboration efforts (Ernst et al., 2010; Kahn, 1996). Second, the evidence on the mechanisms central to a collaborative approach in servitization is presented (Kahn, 1996). This study contributes to the cross-integration literature by providing a new dimension to the collective goals mechanisms, which the findings suggest can play an arbitrary role and reduce the opportunistic behavior of the business units (Kahn, 1996). Moreover, it contributes to the existing stream of servitization literature by showing how servitization strategy cascades down the organization levels (Lenka et al., 2018).

The paper is organized as follows. The following section presents the theoretical background of the study through a synthesis of the relevant literature on servitization. This is followed by a description of the research methodology applied. Then, the case company is described, and the interdependent activities within product-service business units are scrutinized. Finally, the paper concludes with a discussion and considers the implications for future research.

2. Theoretical background

2.1. Resource and knowledge integration in servitization

Industrial firms seek to improve their competitiveness by adding various services to their product offerings in order to provide a comprehensive solution; this change in the corporate

strategy is frequently referred to as 'servitization' (Kowalkowski et al., 2017; Rabetino et al., 2018). Past servitization research has argued that providing solutions instead of products makes what is offered more unique (Ulaga and Reinartz, 2011), creates higher margins (Eggert, et.al., 2014), offers an opportunity to lock in customers (Visnjic et al., 2017), secures cash inflows over a long-term horizon (Shankar et al., 2009; Wise and Baumgartner, 1999), as well as promotes innovation (Visnjic, et.al., 2016).

In mainstream research, the need to shield a new service business from the negative influences of the traditional product business is a common theme (Oliva et al., 2012). The typical solution is to organize the service business and the product business in two structurally separate units (Gebauer et al., 2005; Oliva and Kallenberg, 2003). Yet, Neu and Brown (2005) found that firms also need tight cross-functional integration in terms of resource sharing in order to develop, support and manage complex product-service systems. They claim that the key to successful service development depends on "the integration of business unit responsibilities, intra- and inter-firm collaboration, and decentralized decision-making authority" (Neu and Brown, 2005). Such integration requires a high level of sharing of organizational resources that are acquired, accessed and controlled by different business units (Håkansson and Shenota, 1995; Neu and Brown, 2005).

Yet, several studies have shown that such structural separation, as well as the sharing of resources, increases the likelihood of conflicts, disagreements, and opportunistic behavior (Reim et al., 2016). Product and service business activities are mostly nested and therefore require close and frequent collaboration, often on a day-to-day basis (Visnjic Kastalli et al., 2013). Consequently, the roles and responsibilities in terms of resource access and control are very often unclear (Rönnberg Sjödin et al., 2016). On the other hand, business units are involved in 'coopetition', as both units compete for the same external market share (Tsai, 2002), as well as for the allocation of internal resources (Luo et al., 2006).

Consequently, it is very challenging to successfully combine the product business unit and the service business unit in a judicious balance of 'integrated but separate' structures (Orton and Weick, 1990). In other words, integration needs to be achieved without any tight coupling of organizational structures (Sanchez and Mahoney, 1996). Cases of new product development (Sherman et al., 2005) show that information and knowledge sharing is a successful way of integrating different functional units (Hansen et al., 2005). However, the integration of product and service knowledge components is challenging (Valtakoski, 2017) since business units are pragmatically tied to their particular point of view (Carlile, 2002). Carlile (2002) argues that pragmatic boundaries make knowledge localized and embedded within a function. When the context requires units to collaborate, the underpinning pragmatic knowledge boundaries restrict the flow of information and knowledge from units and generate conflict situations. As a result, business units reinforce their established position, leading often to the creation of functional 'silos' (Sherman and Keller, 2011).

2.2. Product and service interdependent activities

What makes it difficult to embed coordination between the product unit and the service unit is the complementary yet contentious relationship that characterizes these two units (Lenka et al., 2018; Smith and Lewis, 2011). Two units have substantially divergent business logics (Mathieu, 2001; Vargo and Lusch, 2008). Product sales, including spare-part services, are transactional in nature (Baines and Lightfoot, 2013) whilst, increasingly services – and service contracts in particular – tend to be long term and relational (Kowalkowski et al., 2015; Oliva and Kallenberg, 2003), and often deeply embedded in the customers' processes (Ng et al., 2013; Visnjic et al., 2017). Due to the different nature and time frame of the relationship, product and

service business units require different sales approaches and different incentives for the sales forces (Ulaga and Loveland, 2014). While members of the product sales force can be characterized as *hunters* since they are incentivized mainly to sell products to new customers, members of the service sales force could be described as *farmers;* they nurture and maintain customer relationships over the complete product life cycle (Sheth and Sharma, 2008). Consequently, product salesman often lack the knowledge and capabilities to quantify the benefits that accrue from services (Visnjic Kastalli et al., 2013). This dichotomy is usually reinforced by institutionalizing the performance management, that maintains the accountability of units for their independent sales and margin targets (Auguste et al., 2006).

Next, some product-related factors may facilitate development of the service business while others may impede the creation of a viable and profitable service business (Bikfalvi et al., 2013). On the more operational level, it is clearly a challenge to strike a balance between the customization required by service development and the standardization driven by manufacturing competencies (Davies et al., 2006). Typically, firms use back-end product units to standardize offerings and build operational efficiency, while customer-facing front-end service units are utilized to customize the offering (Raja et al., 2018).

From the strategic perspective, firms usually apply multiple service strategies in addition to the logic of selling products (Kowalkowski et al., 2015). Firms prefer to maintain basic product-centric services in parallel with more advanced process-oriented services in their portfolio (Gebauer et al., 2017). As a result, such multi-directional strategies foster ambiguity in the leadership of the firm (Smith et al., 2016) since it is often difficult for senior management to communicate the servitization strategy to staff with clarity (Gebauer and Fleisch, 2007). Consequently, unclear messages cascade down from the leadership into the organizational structure (Jarzabkowski et al., 2013; Lenka et al., 2018).

Product and service business units bring about 'multiple command structures' associated with different organizational culture and behavior patterns (Davis and Lawrence, 1977). Cultural and cognitive bias against the service business concept is also very well documented in the servitization literature (Gebauer and Friedli, 2005). Invariably, product business unit personnel exhibit a "lack of belief in the economic potential of service business" (Gebauer, Fischer, and Fleisch 2010, p. 594).

Moreover, tension between units is created as a by-product of their relationships with external actors (Lacoste, 2012; Vendrell-Herrero et al., 2017). For instance, a typical channel strategy in product sales aims to establish partnerships with autonomous, local distributors (Jovanovic et al., 2016). While such a strategy may boost product sales, it tends, however, to be detrimental to the promotion of the service business – in particular, the more advanced services that typically benefit from direct and close relationships with customers (Bustinza et al., 2013). Several cases have shown that distributors can be powerful intermediaries opposing servitization (Forkmann, et.al., 2017; Kowalkowski and Ulaga, 2017) and that the existence of intermediate actors between firm and customer reduces the possibility of penetrating the service business market.

All these factors cause a functional silo since the performance of business units is dependent on the inter-unit relationship. Business unit performance very often faces pragmatic situations where the decision by one unit has an adverse effect on the performance of the other (Tsai, 2002). Consequently, this study seeks to investigate the following research question: What pragmatic boundaries trigger the 'silo syndrome' of product-service business units in structurally separated organizations?

3. Method

3.1. Research approach

This research is based on an explanatory research design (Eisenhardt, 1989; Siggelkow, 2007). The empirical foundation is built around a multinational capital equipment manufacturer, which was chosen for the fact that all its national subsidiaries were organized with structurally separate product business units and service business units. We purposely selected 10 country subsidiaries from all over the world in order to obtain rich insights into the management of product and service businesses. Thus, the subsidiaries chosen served as autonomous research units (Birkinshaw and Hood, 1998) with their own processes, structures, and cultures but loosely integrated at the higher organizational level. Thus, responsibility for this integration rested with the subsidiary general manager in each country, who served as the country CEO as well.

The choice of empirical setting – the company referred to as *Alpha* in this paper – was deliberate. In line with prior research, we decided to study a traditional manufacturer's adoption of the service business model in a context of industrial capital-equipment manufacturing, a slow-cycle industry (Cusumano et al., 2015) where adding services to the classical product range represents one attempt by an incumbent firm to respond to increasing competition from emerging low-cost manufacturers (Neely, 2008). Consequently, Alpha is a world-leading manufacturer of high-value industrial equipment, offering a broad portfolio of industrial products marketed and delivered on a global basis by Alpha's many product business units. Most of these products carry a high potential for additional service sales, typically in the form of after-sales services such as maintenance, overhauls, and repairs. So, Alpha was clearly a good fit with the aforementioned criteria.

3.2. Data Collection

The empirical study was conducted in two steps. Firstly, the primary investigator spent six months in one of the company's subsidiaries with employee-level access. The idea was to acquire an in-depth understanding of Alpha's product and service businesses. The 'insider' researcher thoroughly examined the managerial processes through participant observation, field visits, and 19 semi-structured interviews with key actors in the subsidiary (Bartunek and Louis, 1996). In addition, archival data were gathered from various internal company sources, such as company reports and presentations.

The interviews began with management representatives and then went on to cover employees fulfilling diverse roles in the subsidiary, e.g. general manager, business line manager, service operations manager, service planner, service sales engineer, equipment sales engineer, and technical support specialists. We used a snowballing technique to identify the interviewees (Kvale, 1996). In addition to triangulation using different data sources, selecting numerous and highly knowledgeable informants who viewed the phenomenon from different perspectives helped mitigate informant bias (Eisenhardt and Graebner, 2007). Furthermore, we attempted to validate our understanding by asking similar questions to multiple informants (Faems et al., 2008).

In the second phase of the study, we approached 10 national subsidiaries of Alpha and conducted 20 interviews. In each subsidiary, we interviewed one general manager and one service business line manager. Since the general managers functioned in the formal capacity of integration points, all possessed a good overview of both the product business and the service business. In addition, secondary data were collected in the form of internal documents

(customer lists, sales revenue, service contracts, meeting handouts, website news and balance sheets) and public records such as annual reports.

All interviews in the second phase lasted approximately 60 minutes. We used a semi-structured protocol developed from insights drawn from the initial, explorative phase (c.f. Fontana and Frey, 1998). Using this protocol, we began the interviews with questions related to the informant's role and career path within the company, then continued with questions concerning the company's shift to a service business model and its current product-service business unit setup, and ended with questions concerning his experience of product-service conflicts and synergies. More specifically, we asked each informant to provide concrete examples of product-service conflicts and how (and why) various business units tended to rationalize their respective positions in these conflict situations.

3.3. Data Analysis

Initially, data analysis started with the development of case histories that were used for within-case analysis. Our case histories focused on anecdotes and examples concerning the occurrence and nature of conflicts, as well as synergies, in the case of each subsidiary, taken separately (Miles and Huberman, 1994; Yin, 1994). These could be best described as statements about the impact of a certain factor or activity (e.g. direct versus indirect sales of equipment) on product-service conflicts or synergies (e.g. integration, information sharing, collaboration, and complementarities).

Building upon this initial analysis, we followed the coding procedures suggested by Corbin and Strauss (1990). Based on the case histories, an inductive process was used to create a list of first-order codes. We aimed to gather as many codes as possible. Afterwards, we grouped our first-order codes into distinct common themes that we labeled as second-order categories**.** Finally, all second-order categories were linked to the third-order categories of 'silo' and 'integration' in order to unpack the antecedents leading to these constructs. After obtaining the final list of second-order categories per subsidiary, we performed a cross-case analysis of factors. Using standard cross-case analysis techniques (Eisenhardt, 1989; Miles and Huberman, 1994), we looked for similar concepts and relationships across cases in order to confirm the factors underpinning the 'silo' (Miles and Huberman, 1994). Figure 1 presents the emergent data structure of our analysis process.

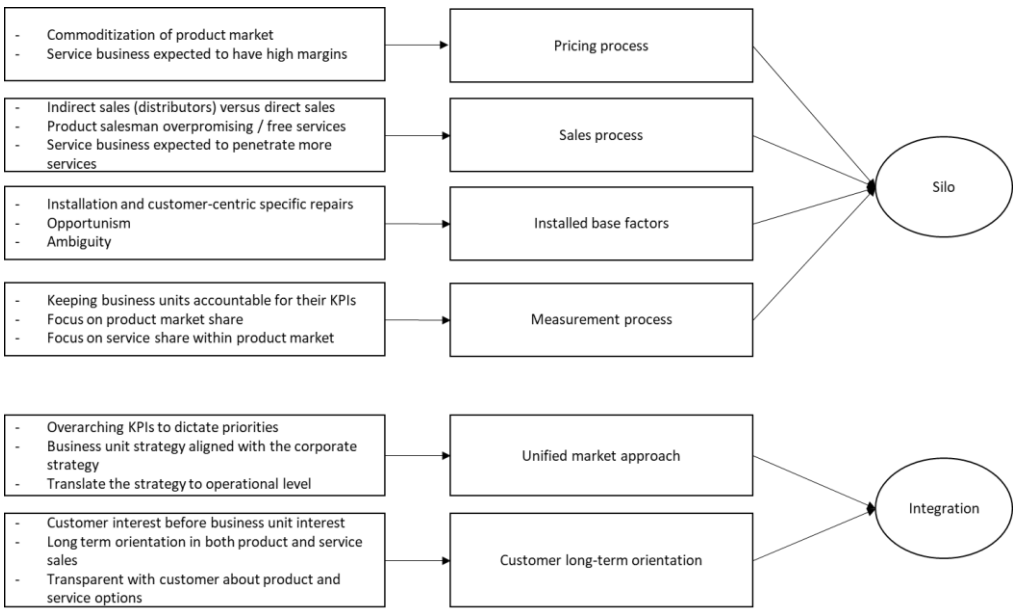

Figure 1: First-order codes, second-order categories and third-order categories

4. Findings: Product and Service Silos Deconstructed

Alpha is a large, multinational capital equipment manufacturer. Alpha's product offering encompasses a portfolio of various items of equipment and machinery. For the majority of customers – which, in most cases, are industrial manufacturers themselves (e.g. B2B sales) – these products represent long-term investments that will remain part of their production systems for many years to come. Given that its product is long-lasting and complex, the Alpha portfolio offered significant potential for servicing. The service opportunities ranged from sale of spare parts and ad-hoc repairs to maintenance agreements with varying degrees of coverage (e.g. from preventative maintenance to maintenance plans offering wide coverage of operational and financial risks).

Alpha operates through a network of country subsidiaries; they represent Alpha in the local market and take responsibility for the delivery of the full range of products and services to local customers. The formal organizational structures adopted by the subsidiaries were consistent: all subsidiaries had structurally separated the service business from the product business creating separate units, with integration operating at the senior-management level of the subsidiary. All subsidiaries were headed by a general manager (GM), responsible for the performance of the subsidiary as a whole, while dedicated business line managers in the product and service businesses were responsible for their respective business segments, reporting directly to the GM.

4.1 Pricing process

The commoditization of the product market was one of the initial motive forces in the creation of service businesses. Alpha's market squeezed product margins and increased the pressure on product sales. One manager explained: "*Within the past three, four years, the market evolution and the whole economic evolution of [the country] has pushed our equipment sales guys to lower their equipment prices. Whatever we used to be able to sell five years ago, we may be selling for 30 percent less today, equivalent product."* The continuous pressure on product prices was also translated into other products and services, as customers related the new 'street price' to the old price. A manager illustrated this as follows: "*That might be very significant in cost, if we just adapt everything to, let's say, the pricing approach, what we used to have during the, what I would call, 'good old days'. Then, there might be some friction when costing for an overhaul of existing equipment, which is 50, 60 percent of the equipment's street price five years ago."* Similarly, one business line manager explained: *"Now with the current pricing and the economic factors included, a call for an overhaul might be up to 70 or 75 per cent (of the new machine). Then you have some friction about what should be done, should we still promote overhaul, or should we advocate equipment replacement?"*

A newly formed service business was expected to bring in higher margins and more stable revenues, but only to alleviate the declining product business performance. Thus, the service business was not fully established as an equally important business unit. On the other hand, the service business had to defend its market position as well. Consequently, with the emergence of structurally separate service-organization and independent-service targets, the service business did not always work in favor of the product business. For instance, a general manager of one subsidiary described a situation where the product sales unit would fail to secure the

tender because of high service prices, which the service unit was determined to maintain. He explained: "*Another example is for instance in sales … we are bidding for a tender for a new machine. The equipment team is going there, and it is offering the machines, and the customer is saying, 'Yes, the machine price is good, but the service is too expensive, so you need to lower the price.' Then, the service team would respond, 'No, we are not going to lower the price' and the equipment team would reply, 'Yes, but then the customer is not going to buy' ... It was a very common issue we find every year, every day."* These examples show that business units often promoted actions that, whilst favorable to their performance objectives, met resistance at the customer interface – pricing issues, most particularly.

One of the frequent techniques used to tackle squeezed product margins was to give discounts (e.g. lower prices) to customers in order to stay competitive in the market place. On the other side, service businesses gave no discounts since they had a mandate to secure higher margins. Such situations often escalated. One manager explained: *"But somehow in services, we practically give no discount, and that has, to a certain extent, brought about conflict, I would say."*

4.2 Sales process

The major driving force behind establishing independent and structurally separate service-business units was most likely the need to have a specialized service sales force. The service sales force was trained to sell services, not physical products. The service business line manager provided an illustrative example of the difference between being a product salesman and a service salesman. On the role of the service salesman, the manager explained: "*I call them farmers, because they have to work on relationships over a period of weeks, months and years. They see the customer more frequently than the equipment […] The equipment guy will perhaps see the customer once every five years, or longer. Whereas, in the aftermarket, the sales engineer would see the customer at least annually. So, we're the farmers [in the service business], and the equipment guys are the hunters."*

Historically, service sales were peripheral and often considered an add-on to product sales. Although the service business unit was promoted in the organizational hierarchy, the product-centric culture continued to follow the old model where services were supplied free of charge to the customer. The general manager of one subsidiary provided this honest view of the situation: "*The services people always say that the equipment salesman gives everything away free of charge. Of course, it produces conflict because, to be perfectly honest, sales people tend to think of the service or spare-part sales, all these things, as the final thing to consider only when the equipment has been sold. They don't consider the sale of spare parts as an important complementary element in the overall package."*

Furthermore, the product business was leveraged heavily on the network of independent distributors and rental companies, which managed the direct contact with end customers. The product business derived significant benefits from distributors in terms of agility, deep knowledge of the local market, local practices, customer relationships, efficient access to the right resources, and territorial coverage. However, the retailers and rental companies were directly taking away the potential market for service business units. The general manager of one subsidiary argued that these intermediaries represented the major issue in deploying the servitization strategy. He said: "*That is always a big part of the problem, because a product salesman, who is selling through distributors, is responsible for a territory and has built up some distributors. Then it is easy for him to have a lead and pass it on to the distributor: the*

distributor arranges a deal, and that's it for him. But then the [need for] service [arises], and then these services are also provided by the distributor. On the other hand, such a set-up would make it difficult for the service business to access and build effective relationships with customers. A general manager explained: "*Then a problem arises when service people say, 'Hey, why didn't you sell it directly, then we could have done the service ourselves, because we always need work for our technicians' … that is very, very much frustrating for the service organization. I'm really against that, so I don't allow it".* The conflicting sales channel strategies make it very difficult for the service business unit to build the necessary direct and close relationships with customers and penetrate the service offerings market.

4.3 Installed-base factors

The contextual factors around the installed base had a dichotomous effect on the performance of both the product business unit and the service business unit. For instance, in cases where the installed base was very complex and closely interconnected with customer operations, the service business had a competitive edge since customers did not wish to change the provider. However, at the same time, such installed base set-ups had an adverse effect on the product business since they were unable to replace the old product with the new one. Consequently, Alpha's approach was shaped by the customer's installation set-up. One manager elaborated as follows: "*I think there are these kinds of operational requirements and engineering requirements. which very much define the customer approach. Because, once you understand this, you will know that a customer who has, say, a 10 or 15 years old set-up, will probably prefer to keep that set-up as it is, because otherwise there would be too many changes affecting the whole engineering installation, if you replace one element with new equipment."*

There is a nuanced situation where the installed-base factors may favor new product sales. For instance, a manager described such a scenario in these terms: "*Then you might have a situation where the customer is… clearly you can see that the unit is 25-years old [product type], and there is already a bit of a struggle for us to support it with spare parts, and definitely the availability and pricing of the overhaul is not going to be cost efficient. Then you need to be open and honest that definitely there is no chance to go for – or there is no sense in going for – an overhaul, and we should definitely, from every angle, advocate replacement of the equipment."* These two examples show how the installed-base factor has the potential to complicate matters and how small details may well determine which side will benefit most from any particular deal.

4.4 Measurement process

Alpha has applied a set of quantifiable measures closely associated with the employee's incentive systems, key performance indicators (KPI), to gauge how the firm is performing over time. Initially, the newly created organizational structure made it very difficult to distinguish the right performance metrics for the respective product and service business units. A general manager explained this situation, thus: "*You might be laughing, it's also a bit of what we're feeling, it was quite scattered, so there was not much system in it, and also it came one on top of the other, and it wasn't clear. In some respects, the system came first, then the KPI was there."* Alpha had a variety of KPIs, as one manager explained: *"We have KPIs for the sales process, we also have KPIs for the number of leads converted into opportunities [and] converted into final sales. We have KPIs on the marketing side, concerned with the generation of leads in the system."*

Yet, it was very challenging for Alpha to set a performance measurement that would make both units work together collaboratively. On the contrary, Alpha ensured that the product business units and the service business units remained accountable for their respective performances. One service business line manager explained to us: *"Our target is only services and service contracts; the service business, not equipment sales, not equipment targets."* As a result, business units become even more alienated from each other. As one manager intimated: *"I think another driver for why it happens (conflicts) is because we have very dedicated KPIs, because in customer centers – for example, services – we have the KPI for the sales revenue, and the KPI for efficiency. In equipment sales, they have the KPI for how many units they have sold, and profitability also. It's a different KPI we need, and that's to make our focus the business, but we lack some people in the middle to create a balance."* Consequently, it was very difficult to balance the targets and integrate product and service business units.

5. Building cross-functional integration for product and service business units

The management of Alpha applied a high level of collaboration at the senior-management level. Alpha realized that, if senior leaders are not aligned, they will not be able to effectively communicate the corporate strategy to middle management and their operatives. One manager explained: "*You need to have high-level collaboration on the management-team level, and to make sure that everybody is always aligned."* Additionally, they also understood that they needed to be very vocal about the servitization strategy – and pragmatic about how to cascade the message down through the organizational hierarchy. A senior manager reported: "*Everything has to start from the mission, so it has to be translated into common-sense language, so that everybody understands what we are supposed to do as a business. We need to be able to spell it out clearly and speak it out loudly and, out of that mission, you need to then come up with a strategy, and that strategy will then evolve into an action plan. It's kind of a pragmatic approach."* Similarly, the management integrated the business units by focusing on questions that transcended the business unit perspective. For instance, a manager supplied a few examples of questions they frequently discussed at senior management meetings: "*Is it how we make [Alpha] the best? Is it how we beat the competition? Is it how we give the best to the client? Do you have some sort of… is it what is fair for the product and service organizations?"*

Senior management, in stressing the need for a clear understanding of how to approach the market, was subsequently able to align business unit activities. One general manager explained the approach: "*I think the resolution comes definitely from the open collaboration between the various divisions, so these kinds of siloed structure, or silo mentality can't exist, so we need to think in terms of one united market approach. Then, what I think is very important is to have the management team thinking alike, with the customer center stage. Everybody must be aligned on the concept of approaching the market. You can't have a situation where you have different kinds of business areas or business divisions driving in different directions. Everybody has to be aligned."*

Alpha management set up a joint strategy to guide both product and service business units. A manager explained: "*You need to have your own strategy for your division, which has then to be conveyed in the same way, so that people see the connections between the company strategy and your divisional strategy, that they are supporting each other and are constantly being communicated."* Similarly, both business units need to mutually agree on the approach. A senior manager asserted: "*You need to have a joint strategy for the company where all the [business units] are contributing, and are listened to and appreciated, and mutually agree that, 'OK, for services, this is the way forward in this market, and this is the way we're going to do*

it.' You need to have a strategy not only for the whole company but also for [the business units], and then you need to have a clear implementation strategy that says, 'OK, using these means, we can do this on the service side or, by means of these activities, we are able to do this for industrial compressors or whatever the equipment division is."

On the operational level, Alpha management argued that the solution to prevent onset of the 'silo syndrome' lies in establishing the overarching KPIs that will enforce coordination between the units. In other words, the corporate focus on certain KPIs may serve as a tool to alleviate a potential conflict situation between two business units. A general manager explained: "*I think we have three KPIs, which are very important. We, first of all, focus on market share, meaning what is the market we actually see, with regard to our equipment offering and the tenders we get. After that, the other important parameter is customer share. What business do we actually generate from the existing customers we have, and what are the opportunities there? Then, the third important parameter is the one-to-one ratio. What is the service business and service coverage for the customers we already have. You then consider, 'OK, we want to get more market share, do we want to get more market share for new equipment or new applications, or do we want to go for existing customers and sell more to them, whether it's new equipment, new applications, or new services.'"* The overarching corporate KPIs that established priorities served as an important control system to integrate the business units.

Another important aspect of integrating the product and service businesses is to have a long-term perspective, focusing on the long-term benefit of the customer. A general manager explained the underlying logic in a nutshell: "*Then, what you need to have a look at is the long-term benefit for us; let's say that the customer is not signed up with us for services, they might have a breakdown, and they want to go for a refurbishment, and maybe that repair or overhaul that you provide might lead to a future service contract with the customer. Then, probably you would want to go with the service approach, you want to fix the issue, you want to keep the customer happy, you want to show that you provide a competent service, and then build on that, – making sure that they become your service customer, which then enables you to replace the equipment in the long run because they have a service contract with you."*

A senior manager provided an example of how Alpha managed to both win customers and integrate the business units: "'*OK there's the price to an overhaul of the compressor, there's an option to look at a new, more energy-efficient compressor, which may be smaller, but we'll offer you energy savings and running cost savings.' Now, the customer is thinking, 'OK, well, they've given me an option. I don't feel pressured into taking the overhaul, I don't feel pressured into buying new equipment. They've got the best interests of my company at heart because they're talking to us about better options."*

6. Discussion

The case study design imposes some obvious limitations on the generalizability of our findings. However, given the maturity of the corporation studied and the research design covering 10 of the corporation's subsidiaries, it seems plausible that the factors identified are valid for other capital-equipment manufacturers deploying a servitization strategy by following the general advice of creating separate product-service business units. Thus, assuming that the present findings are generally valid, they raise several issues that require further discussion.

Our study contributes to cross-functional integration research in the context of highly interdependent product-service business units (Ernst et al., 2010; Pfeffer and Salancik, 1978).

First, we explore the concept of functional 'silos' using pragmatic framing at the business-unit level (Carlile, 2002). Structural separation imposes boundaries since business-unit knowledge is localized and embedded in the practices of the business units (Carlile, 2002), and it impedes knowledge transfer between business units (Tsai, 2001). Business-unit knowledge is siloed with regard to the pricing process (Kindström, et.al., 2013; Rapaccini, 2015), the sales process (Kowalkowski and Ulaga, 2017; Ulaga and Loveland, 2014), the installed-base factors (Jovanovic et al., 2016) and the measurement process (Auguste et al., 2006). Although servitization literature has explored these factors extensively, this study characterizes them as alienation devices at the business-unit level and ascribes fine-grained attributes to their diverging nature. While structural separation enables the service business to grow, it simultaneously creates pragmatic knowledge boundaries around business units and fuels product-service conflicts (Reim et al., 2016). Consequently, such boundaries produce negative consequences since they effectively impede collaborative approaches (Ernst et al., 2010; Kahn, 1996).

We present evidence concerning the mechanisms that are pertinent to a collaborative approach in servitization (Kahn, 1996). First, our study highlights the role of senior leadership in business-unit strategy alignment (Gupta and Govindarajan, 1984; Powell, 1992). Second, our paper helps to link control systems to business-unit strategy (Govindarajan and Gupta, 1985) since our findings suggest that overarching performance metrics can play an arbitrary role and reduce opportunistic behavior on the part of business units (Kahn, 1996). Third, the long-term benefit of the customer is affirmed by this research as a key goal in cementing buyer-supplier relationships (Ganesan, 1994; Lindenberg and Foss, 2011).

Finally, this study adds to the existing literature stream with regard to the multi-level perspective on servitization by showing how a servitization strategy cascades down through the organization levels (Lenka et al., 2018). This is one of the first studies to explore business-unit silos in servitization and consequently adds to our understanding of the antecedents of servitization failure (Valtakoski, 2017).

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