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Strategy map of servitization

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ABSTRACT

By representing the servitization of three leading corporations via a strategy map, this multiple-case study discusses how the strategic logic of servitization can be explained by linking the key practices adopted by manufacturers to support critical processes while shifting their focus to project-based customer solutions. The results draw on data collected from solution providers operating in the metal and machinery industries headquartered in Finland. By examining the strategic actions, tools, and processes behind the implementation of servitization, this study extends recent debates on the service-based business models of manufacturing companies. For servitization theory, this study develops a strategy map for a solution provider. For manufacturing firms, this study provides a framework and a tool for benchmarking, developing and implementing a strategy while mitigating the processes of long-term value creation and appropriation.

1. Introduction

Manufacturers have shifted their focus from products to customer solutions in search of higher returns and additional growth opportunities (Matthyssens and Vandenbempt, 2008; Sawhney, 2006). This shift, described as servitization (Vandermerwe and Rada, 1988), is not a simple process, and positive outcomes cannot be guaranteed (Gebauer et al., 2005; Lee et al., 2016). Undesirable outcomes are repeatedly linked to poor implementation (Fang et al., 2008; Kohtamäki et al., 2013b; Visnjic and Van Looy, 2013). The effective implementation of servitization requires a clear understanding of the company's strategic logic, including how it intends to achieve the financial targets of servitization through supportive processes and aligned assets. Due to strategic convergence, the logic with which companies implement their strategies, rather than the strategies themselves, will emerge as the source of competitive advantage (Kaplan and Norton, 2006).

Although previous studies have discussed the core challenges and subjects in the implementation of servitization (Alghisi and Saccani, 2015; Martinez et al., 2010), only a few have provided overviews of the key processes and practices needed to execute servitization (Baines and Lightfoot, 2014, 2013; Gebauer, 2011; Storbacka, 2011; Storbacka et al., 2011). While “processes are frequently overlooked during debates about advanced services” (Baines and Lightfoot, 2013: 199), existing studies typically focus on function-specific practices without linking initiatives at different organizational levels. None of the existing studies actually describes the strategic logic of servitization through the application of a holistic approach, such as a strategy map. This lack of evidence restrains research on the sources of competitive advantage and profitability related to servitization. Therefore, a holistic understanding of the strategic logic of servitization while analyzing key initiatives and practices for strategy implementation is needed.

This study aims to improve the understanding of servitization implementation by answering the following research question: how can the strategic logic of servitization be explained by linking the key practices adopted by manufacturers when shifting their focus to project-based customer solutions? We address the research question by conceptualizing the strategic logic of servitization through a thorough review of the servitization research combined with a multiple-case study. The present study contributes to the servitization literature by identifying and linking key practices at different organizational levels that are central to strategy implementation in leading industrial companies. Based on the strategy map, the resulting framework facilitates manufacturing firms’ strategic planning and effective strategy implementation.

2. Mapping the servitization strategy

The selection and execution of hundreds of interconnected activities in which companies choose to excel constitute the foundations of

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strategy (Porter, 1996). Such an activity system defines the way in which a company generates, delivers, and captures value by covering the central processes, activities, and resources of the company at different levels of aggregation. A company's potential for generating competitive advantage is determined by how well its activity systems can exploit and leverage different structural determinants of cost or buyer value (e.g., scale, accumulative learning, links between activities, capacity utilization, and vertical integration). These drivers turn competitive advantage into an operational concept (Sheehan and Foss, 2007) and explicate a company's strategic logic (Porter, 1991).

Kaplan and Norton (2000) proposed the concept of a strategy map as a cause-and-effect tool to describe the strategic logic of a company while identifying critical sources of synergy and value creation. The map includes four intertwined strategic perspectives (Kaplan and Norton, 1996): financial, customer, internal processes, and learning and renewal. The financial perspective defines how an organization can achieve financial targets by balancing short- and long-term strategies. This challenge requires the creation of appropriate value propositions for each customer segment (from the customer perspective), the development of the required internal processes to deliver the value proposition (from the internal perspective), and the alignment of intangible assets (from the learning perspective).

Companies implementing servitization represent a case in point, as strategic alignment constitutes an important challenge during the service transition (Martinez et al., 2010). After changing the strategic vision (Alghisi and Saccani, 2015), servitizing manufacturers must realign their financial targets, value propositions, processes and resources (Kindström and Kowalkowski, 2014; Kujala et al., 2010; Löfberg et al., 2015; Storbacka et al., 2013; Visnjic and Van Looy, 2013). This realignment requires the translation of the company's strategic vision into choices (Alghisi and Saccani, 2015) while introducing various initiatives, actions, and practices at different organizational levels (or strategy map perspectives), which are at the core of the next discussion.

2.1. The financial perspective

Previous research has emphasized higher profit margins, stable income and revenues, and additional growth opportunities as key financial drivers for product-centric servitization in industries in which competition and commoditization has been increasing for years (Gebauer et al., 2005; Oliva and Kallenberg, 2003; Sawhney et al., 2004; Wise and Baumgartner, 1999). As shown in Fig. 1, the first level of the strategy map illustrates the financial targets of servitization while decomposing them into two complementary levels. First, the productivity strategy aims to enhance profitability over the short-term by optimizing operations and internal processes, reducing operational expenses and costs, matching offerings and operations (Jovanovic et al., 2016), and using assets more efficiently while maintaining reasonable costs and prices (Anderson and Narus, 1995) and superior service quality (Gebauer, 2011). Although initial investments and reallocation of slack resources to uncertain service business initiatives (Fang et al., 2008; Gebauer and Fleisch, 2007) temporally reduce productivity, servitizing manufacturers must leverage knowledge and realign resources (Huikkola et al., 2016) while creating synergies that improve asset utilization and "result in cost savings and competitive differentiation advantage" (Fang et al., 2008: 2).

Conversely, the growth strategy has two components and aims to improve a) mid- and b) long-term revenues. First, by attracting new customers, entering new market segments, and incrementing the share of wallet of existing customers through deeper customer relationships, manufacturers can promote mid-term growth. Second, realigning offerings to support sales of intermediate and advanced product-related services at different stages of the product lifecycle can provide benefits over the long term. Thus, initial financial imbalances can be corrected over the medium and long term as the service business reaches a minimum sales threshold and becomes profitable (Fang et al., 2008).

2.2. Customer value proposition in servitization

At the core of the customer perspective, the value proposition is crafted to solve customers' problems (Reinartz and Ulaga, 2008) and requires a double shift from product functionality and efficiency to product effectiveness for a particular customer's processes and from short-term transactions to long-term, relational agreements (Oliva and Kallenberg, 2003; Stremersch et al., 2001). However, heterogeneous customers have different needs. For instance, Baines and Lightfoot (2014: 4) identified three generic customer types: 1) "do it themselves" customers, who only demand basic services, 2) "do it with them" customers, who demand intermediate services, and 3) "do it for them" customers, who pay for advanced services while contracting for "capabilities" offered through their "use" of a "product." In the latter case, value for customers is mainly related to product "availability and performance, along with risk and reward sharing" (Baines and Lightfoot, 2014: 22).

As a result, each customer segment requires different value propositions built on different attributes (Gebauer, 2008; Gebauer et al., 2011; Helander and Möller, 2007). Based on the three value disciplines proposed by Treacy and Wiersema (1993), Matthyssens and Vandenbempt (2008) suggested three potential value propositions for a manufacturer: a) differentiation based on product innovation and features (product leadership), b) differentiation based on service innovation and the customer relationship (customer intimacy), and c) differentiation based on operational excellence and fair value (operational excellence). According to Kaplan and Norton (2000), customer-driven organizations that aim to provide customer solutions strive to excel in customer intimacy while upholding threshold standards in operational excellence and product leadership.

2.3. Processes for crafting a customer-centric value proposition in servitization

At the third level of the map, internal processes define how a company creates and delivers the required value proposition to each customer segment (Kaplan and Norton, 2000). First, operational processes are central to productivity (Kaplan and Norton, 2004a). Therefore, servitizing companies need to centralize their manufacturing activities to integrate their supply chains (Bustinza et al., 2013) and achieve both flexibility and cost efficiency (Baines et al., 2009). In addition, reliable service processes and field service networks are critical for ensuring successful service delivery (Kindström and Kowalkowski, 2014) while providing valued and cost-effective services and identifying new service opportunities (Ulaga and Reinartz, 2011). Second, the implementation of customer management processes and practices (Storbacka et al., 2013; Windahl et al., 2004) is critical for forging long-term quality relationships with customers (Bowen et al., 1989; Gebauer et al., 2005; Kohtamäki et al., 2013a; Tuli et al., 2007). Finally, innovation processes for developing new offerings (Galbraith, 2002) must be grounded in a thorough understanding of current and future customer needs and value dimensions (Baines et al., 2009; Gebauer, 2011; Gebauer and Fleisch, 2007).

By aligning and leveraging their internal processes, companies can enhance their competitive advantage while exploiting various drivers of cost and value. For instance, companies can reduce costs by benefiting from economies of scale and scope, increasing standardization in service operations (Ulaga and Reinartz, 2011), reducing delivery costs, and increasing switching costs to lock-in customers (Reinartz and Ulaga, 2008). Manufacturers can also emphasize long-term customer relationships (Tuli et al., 2007) and highlight the co-creation of customer experiences (Vargo and Lusch, 2004). Lusch and Vargo (2006: 284) distinguished between two nested components of value

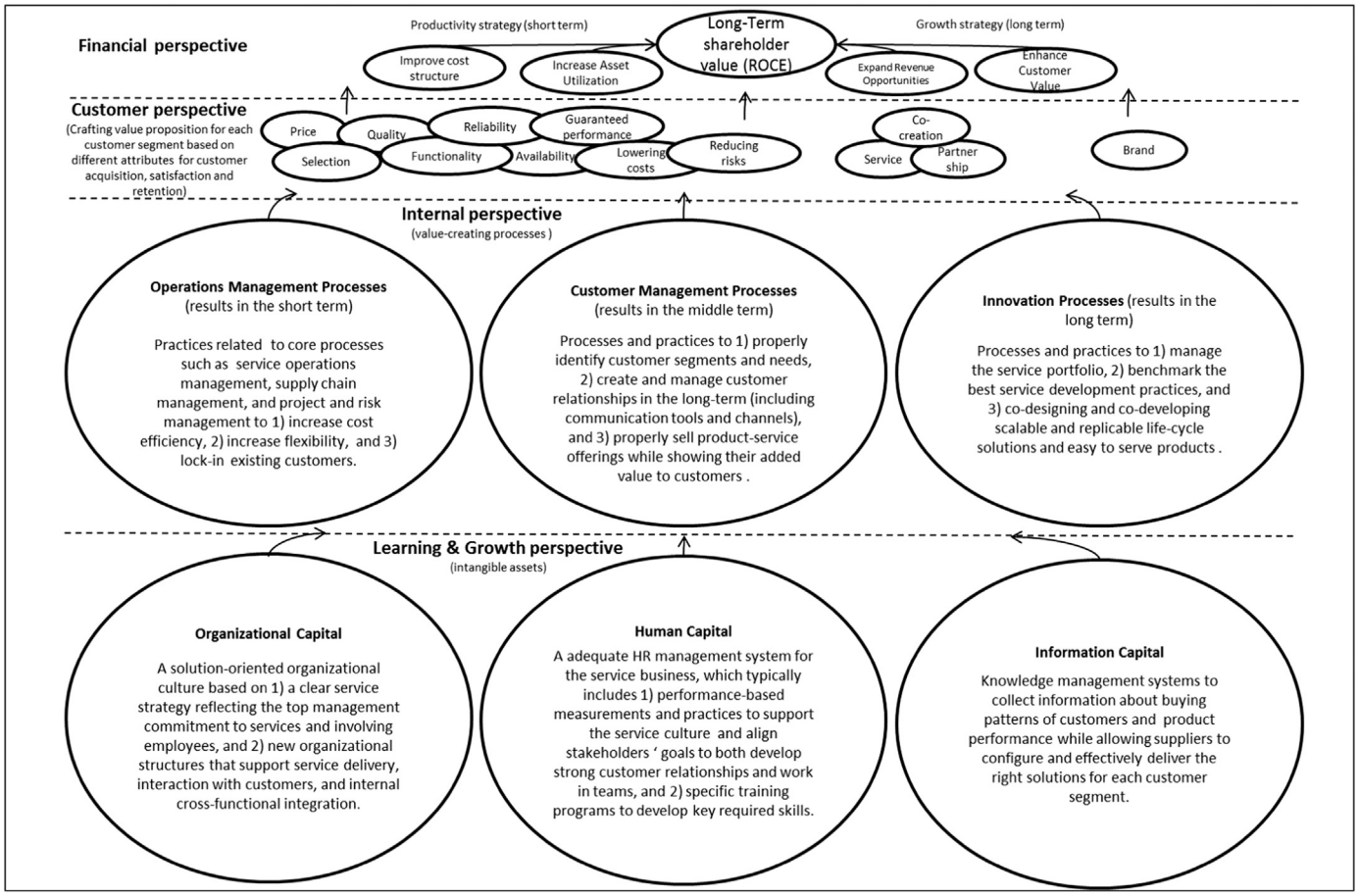

Fig. 1. Strategy map of servitization: key levels, processes and activities.
SOURCE: Our elaboration based on the literature review.

co-creation. While the co-creation of value is an outcome realized through interaction in the consumption process, the co-production of value encompasses participation in the creation of the core offering through co-designing and co-developing the value proposition (Kohtamäki and Rajala, 2016; Parry et al., 2012). For servitizing manufacturers, "collaborative practices supporting the coproduction of service offerings, as well as the practices of co-creating value-in-use, are of special importance" (Kohtamäki and Rajala, 2016: 1–2). In addition, understanding value co-creation requires awareness of the required service capabilities (Zhang and Chen, 2008) as well as of the knowledge absorption and encounter mechanisms that facilitate such processes (Grönroos and Helle, 2010; Kohtamäki et al., 2013b; Payne et al., 2008).

Smooth service exchanges and enhanced interactions increase the value of service for the customer while increasing customer satisfaction (Auh et al., 2007), develop customer relationships, loyalty and commitment to the supplier (Grönroos and Helle, 2010; Theoharakis et al., 2009), and attract new customers based on customer referrals (Grönroos and Helle, 2010; Homburg et al., 2003). Relational rents are translated into monetary terms in the form of up-sales, cross-sales and re-sales (Grönroos and Helle, 2010), higher price tolerance and margins from more loyal customers (Heskett et al., 2008; Homburg et al., 2003; Theoharakis et al., 2009), and thus, increasing market shares (Flint et al., 2011; Reichheld, 1993). Conversely, customers may benefit from lower total ownership costs together with the superior value obtained from customized offerings, complementarities in the use of products and services, customer intimacy, product availability, risk reduction, and system performance (Gebauer et al., 2005; Salonen et al., 2006; Visnjic and Van Looy, 2013). Consequently, manufacturers will be able to increase prices and sales while achieving greater profitability and economies of scale (Visnjic and Van Looy, 2013).

2.4. Intangible assets in servitization

Servitizing manufacturers must also recognize the importance of intangibles as a prerequisite for success (Bowen et al., 1989). First, companies must cope with organizational resistance (Antioco et al., 2008), internal conflicts and political costs throughout strategy implementation (Gebauer and Fleisch, 2007; Matthyssens and Vandenbempt, 2010; Salonen et al., 2006). A shift in organizational culture toward service-oriented values and behavior is essential to implementing servitization (Gebauer and Fleisch, 2007; Homburg et al., 2003; Mathieu, 2001). Indeed, companies must balance service- and manufacturing-oriented values (Gebauer et al., 2005). While a separate service organization permits the establishment of a service culture without disrupting product organization (Oliva and Kallenberg, 2003), servitization also requires cross-functional and intra-organizational integration and coordination (Kindström et al., 2012; Martinez et al., 2010) to overcome distances among sales, production, and service operations (Storbacka, 2011; Storbacka et al., 2013).

Second, implementing specific human resource management practices to craft a service-oriented sales force is critical to optimizing the service orientation of organizations (Gebauer et al., 2005; Malleret, 2006; Mathieu, 2001; Reinartz and Ulaga, 2008). Companies must employ staff with appropriate skills and expertise to "perform the internal processes critical to strategic success" (Kaplan and Norton, 2004b: 225). Skill-based training (Antioco et al., 2008; Bowen et al., 1989; Gebauer and Fleisch, 2007) and coherent outcome-oriented compensation strategies (Anderson and Narus, 1995; Antioco et al., 2008; Reinartz and Ulaga, 2008) are powerful instruments for fostering

Table 1
Sample and data description.

Case	Core products	Core services	Respondents' job titles and organizational positions	Code	Length of the interviews	
					*	**
A	Marine propulsion systems and power plants	Spare parts and operations and maintenance services and solutions for the entire lifecycle of its installations	Pricing Manager, Services	A1	23	105
			Vice President, Integrated Solutions	A2	17	79
			Director, Project Management	A3	9	50
			Vice president, Product Business Unit	A4	12	52
			Director, Strategic Business Development	A5	11	49
			Director, Business Intelligence	A6	8	45
			General Manager, Agreements	A7	21	80
			Director, Logistics	A8	18	76
			Vice President, Services	A9	14	66
			General Manager, Innovation & Business Development	A10	9	41
			Director, Services	A11	22	105
B	Product lines and technologies for the pulp, paper, and power industries	Expert and maintenance services (spare and wear parts and consumables)	Director, Agreements	B1	28	63
			Service Business Development Manager	B2	28	84
			Manager, Engineering and Project Management	B3	21	92
			Technology Manager	B4	46	138
			President, Service Business	B5	19	61
			Product Development Manager	B6	29	120
			Senior Manager, Concept Development	B7	32	145
C	Technologies for the metal and mineral processing industries	Spare parts, maintenance and technical services, modernization, and operations	Product Service Support Manager	C1	9	40
			Head of Services	C2	17	77
			Specialist, Lifecycle Costing	C3	16	76
			Director, Strategy and Sales Development[a]	C4	38	163
			Director, Account Management	C5	21	78
			Process Owner	C6	24	101
			Director, Service Business Development	C7	16	55

*Number of pages, single spaced text, times new roman font size 12.
**Length of the interviews in minutes.
[a] Two interviews with this person.

a service-oriented culture (Kindström and Kowalkowski, 2014) and implementing a service-based business model (Baines and Lightfoot, 2014; Parida et al., 2014; Visnjic and Van Looy, 2013).

Finally, a customized value proposition requires better customer knowledge (Kindström et al., 2012). Therefore, companies must use customer data when developing new offerings (Bowen et al., 1989). Companies can simultaneously collect relevant information to understand how the installed base performs, to identify customer needs, and to determine how customers use the sold products. Information and communication (ICT) systems not only enable improved customer relationship management (Baines and Lightfoot, 2014) and relationships with suppliers (Saccani et al., 2014) but also improve the design, integration and delivery of product-service systems (Opresnik and Taisch, 2015; Vendrell-Herrero et al., 2016) while allowing manufacturers to reduce costs by increasing internal efficiency (Kowalkowski et al., 2013; Meier et al., 2010). These systems also enable product maintenance, repair, field operations (Baines and Lightfoot, 2014), cost estimation and risk assessment (Schweitzer and Aurich, 2010; Storbacka et al., 2013). In turn, manufacturers can improve their future products, service delivery processes, and working practices (Baines et al., 2011; Davies, 2004; Osegowitsch and Madhok, 2003).

3. Research methodology

3.1. Research strategy and case selection

This study uses a multiple-case study to map the servitization strategies of three Finnish global technology manufacturers and service suppliers in the metal and machinery industries. We selected three large companies from a list of 19 corporations involved in a five-year (2011–2015) industrial services research project. In 2014, the case companies' net sales ranged from 1,400 to 4,800 million euros, and the share of service-related sales ranged from 37% to 40% of total sales. Because we are interested in mapping state-of-the-art practices and tools in project-based companies, each case was carefully selected to produce similar results through literal replication (Yin, 1994). While following a straightforward, purposeful sampling approach (Patton, 2002), our selection criteria identified information-rich cases that 1) focused on complex systems, 2) had been implementing servitization strategies for more than five years, and 3) had been continuously redesigning their service offerings to provide customers with comprehensive solutions, including projects, advanced services and long-term service agreements.

While case studies are appropriate tools for exploring subjects that are difficult to replicate (Eisenhardt and Graebner, 2007; Siggelkow, 2007), the chosen firms are "information-rich" examples that allowed uncommon research access (Eisenhardt and Graebner, 2007; Yin, 1994) and are worthy of in-depth analysis (Patton, 2002: 231). Delivering complex systems involves particular characteristics, such as emphasizing value co-creation (and co-production) and adopting a lifecycle perspective, while integrating more closely into customers' operations (Artto et al., 2015). These specific characteristics call for a wide range of processes and practices and increase the richness of project-based firms as cases for analyzing the implementation of servitization initiatives. These specific nuances of the chosen cases may also have also introduced particularities that explain some of the findings that would be less relevant to other companies pursuing other servitization strategies, such as the emphasis on practices related to system integration and project management or the adoption of a set of practices supporting the lifecycle perspective.

3.2. Data collection and analysis process

We adopted a synthesizing practice applied in previous research (Kindström and Kowalkowski, 2014; Rabetino et al., 2015; Storbacka et al., 2013) and combined existing interview data to identify the key processes and primary initiatives implemented by the case companies. We complemented existing data by collecting detailed information on the strategy map in a new round of interviews (nine additional interviews). We selected informants from various organizational levels based on their personal experiences with industrial services. Representatives from various areas enabled us to examine different levels of the strategic map in detail. The interviews, which lasted 82 min, on average (between 40 and 145 min), were recorded and transcribed verbatim immediately after each meeting (20 pages, on average). Table 1 provides further details about the interviews. To ensure the anonymity of the companies and respondents, cases and direct quotes are identified using codes.

Content and thematic pattern-matching analyses were employed to examine the data (Yin, 1994). First, we listed the key processes and the main supporting initiatives and tools implemented by the case companies after manually coding the interviews according to the four perspectives involved in the strategy map. This task culminated in the elaboration of a within-case table. Next, to isolate patterns across the cases, we implemented cross-case analyses (Eisenhardt, 1989; Huberman and Miles, 1994) while evaluating whether the processes, initiatives, practices, and tools previously identified were present in each company and determining how they appeared in the different firms.

The information from interviews was supplemented with other sources of evidence (e.g., annual reports and internal documents) to strengthen the validity of our cases. Triangulation of active and passive data was employed to identify the processes and practices, to verify the accuracy of the data (Yin, 1994), and to increase the reliability of the research (Beverland and Lindgreen, 2010). Finally, two senior researchers and various interviewees reviewed a draft version of this article to further strengthen the validity of the research (Gibbert et al., 2008; Yin, 1994).

4. Mapping key initiatives, practices and tools for implementing servitization

Table 2 presents detailed information related to the key findings from the three analyzed cases and organizes these results based on the four perspectives of the strategy map.

Based on the actions taken by the case companies (Table 2), a strategy map is represented in Fig. 2. Starting from the top down, the strategy map of servitization illustrates how our case companies linked critical initiatives at different levels to achieve the firms' performance targets while creating value propositions from intangible assets and exploiting diverse drivers to enhance performance. As shown in Fig. 2, the map can be decomposed into three top-down vertical sequences of core thematic cause-and-effect relations that span the four levels of the map and support either productivity in the short term or revenue growth in the medium and long term. Based on our analysis, operational efficiency, customer management, and portfolio development are the core themes, which constitute the DNA of the servitization strategy. Because many of the initiatives support more than one process and some may support each other, the figure includes arrows illustrating these interactions.

4.1. Matching corporate targets and value propositions to each targeted customer segment

As shown in Table 3, companies' overall strategies were directed at increasing net sales and EBIT or EBITDA (although the case companies use indicators that are oriented toward individual customers, KPIs that measure business success are still very product oriented). In this context, the productivity strategy called for minimizing operating cost while matching companies' operations and offerings. In addition, maximizing the profitability of each customer segment calls for a growth strategy that boosts revenue growth by attracting new customers and incrementing the share of wallet of existing customers through deeper customer relationships that enable sales of product lifecycle services. This combination of productivity and growth strategies implies that (at the customer level) the case companies have to sell, integrate, and deliver the right (mass-customized) value proposition for each customer segment at the right price and time.

Accordingly, the case companies mainly combined attributes from two of the three differentiators (value disciplines) originally proposed by Treacy and Wiersema (1993): operational excellence (e.g., competitive price, quality, reliability and availability), and customer intimacy (e.g., partnerships and easy to deal with). Attributes related to the product/service leadership value discipline (e.g., functionality and uniqueness) were also listed as relevant but not unanimously highlighted by all our case companies. Overall, simultaneously stressing operational efficiency (e.g., service operations, supply chain, and project and risk management), customer management (e.g., relationship and sales management), and innovation-related processes (e.g., portfolio development management), the implementation of servitization called for launching different initiatives at the third (internal processes) level of the map.

4.2. Aligning internal processes and intangible assets for value creation and appropriation

4.2.1. Productivity strategy and key value appropriation through operational efficiency

On the left-hand side of Fig. 2, productivity strategy called for reducing service operational costs, which required implementing diverse initiatives at the internal process level to match service- and product-related operations and offerings, to reduce operational expenses, and to use assets more efficiently. While the analyzed companies used to have separate service units (cost centers with profits and losses responsibilities), they progressively started implementing end-to-end operations to integrate offerings more effectively and to achieve higher levels of accountability, transparency and delivery speed.

However, quick response procedures were viewed as difficult to combine with efficient delivery practices; interviewees recognized this as a trade-off (Table 3). Supply chain integration (forwards and backwards), development (e.g., using suppliers' development programs) and defining service delivery processes were highlighted as central to meeting these challenges while increasing readiness, decreasing operational costs, and ensuring appropriate service quality. In so doing, project management processes are at the core of all project-firms' operations but particularly when integrating and delivering complex offerings. Because customer solutions involve both operational and financial risks (e.g., including availability), risk-sharing models and risk-management systems also emerged from the interviews as particularly important concerns when offering performance agreements.

In addition, as suggested by Zhang et al. (2016), network organization and appropriate delivery structure development are necessary to effectively respond to customer needs in global engineering services. While service delivery networks were organized either internally or through hybrid arrangements, being close to customers and controlling field service provision were seen as key to ensuring quick responses and opportunities for acquiring critical insights into customer operations and needs and minimizing maintenance costs through early problem-solving (which are particularly relevant when guaranteeing performance and availability).

In this context, the combination of modularized offerings, (standard frame) long-term service agreements for different service levels, and

Table 2
Key findings from the in-depth case studies.
SOURCE: Our elaboration based on interviews with the companies.

Perspective		Themes	Case A	Case B	Case C
Financial perspective		Targets and KPIs	– The income statement, order intake, net sales, EBIT, working capital, non-conformity costs as a percentage of net sales, and customer satisfaction index.	– Net sales, bookings, and profitability (EBITA).	– EBIT, EBITA, capacity utilization, net sales, order intake and sales margin (per sales category), one-time services vs. service agreements, target growth vs. competitors, sales activity (number of sales visits), hit ratio, OTD.
Customer perspective		Value proposition and attributes	– To be the preferred business partner to our clients. – Environmental attributes are clearly present. – Improving customer businesses. – Availability, reliability, power guarantee, and upholding maintenance budgets.	– To improve customer performance and the performance of customer operations. – Productivity and production, higher quality, fewer process disturbances, mechanical reliability, availability, ease of use, time efficiency, and the total cost of ownership.	– Sustainability while providing the best return on customer investments. – Quality, selection, functionality, partnership, predictability, cost and maintenance cost.
Internal perspective	**Operations Management Processes**	Operational flexibility and adaptability	– Central warehouse for spare parts and external delivery partner. – End-to-end operations for each business line (from R & D to services). – Modular products and service portfolios.	– Process development for the service supply chain. – Narrowing the service product base. – Building service centers close to customers. – Risk-sharing models and risk-management systems. – Modular products and services.	– Modular products and services. – Risk management tools, documentation and processes. – Reintegrating services into other business lines. – Delivery time as a new issue when bargaining with suppliers.
		Service structures	– Creating a new organization based on service portfolios. – Implementing organizational change to empower people (areas) that are in close contact with customers. – Building a global service network. – Standard agreements.	– Service business is separate from product business. – Extensive network to deliver field and workshop services. – Standard agreements.	– Description of delivery processes for service business. – Appointing dedicated personnel for service delivery. – New distribution channels that are closer to customers. – Standard frame agreements. – Use of consultants to achieve best practices.
	Customer Management Processes	Relationship marketing management & solution commercialization	– Segmenting customers based on the required certainty of operations and expert support. – Providing easy contact points for customers. – Building multilevel dedicated sales teams for each customer. – Implementing a global CRM. – Shifting from cost plus to performance-based pricing. – Establishing multilevel and bilateral groups when preparing long-term agreements. – Sales funnel.	– Segmenting customers based on required service levels. – Nominated sales manager for most customers, and corporate account managers and executive sponsors for key corporations. – Agreement management and bilateral steering / development group for long-term agreements. – Call reports in the CRM system after visiting customers. – Internal plans for customer ship growth. – Agreements include bonus and penalty models based on performance. – External business intelligence partner for selecting new customers. – Use successful stories for sales purposes. – Use value-based scenarios for sales purposes. – General tools to estimate potential added value or cost savings. – Sales funnel model for major agreements.	– Customer segmentation based on sales potential (and turnover) and existing relationships. – Multiple channels to customers (service engineers, production line sales persons, higher-level service managers). – Two-level customer management organization (site- and key-account management). – Value calculator for internal use during value-based pricing and for preparing value visualization slides.
	Innovation Processes	Portfolio development	– Interviewing customers using a screening template to determine the	– Interviewing customers. – Using call reports (CRM) to identify customer demands.	– Use of externals to uncover new service ideas. – Appointing customer support

(continued on next page)

Table 2 *(continued)*

			viability of a new project. – Searching for market innovation through co-development with customers. – Broadening the service portfolio based on service company acquisition.	– Appointing specialists to examine customer processes while connecting them with service portfolios. – Establishing a services concept development team for service innovation and proof of new concepts. – Larger service portfolios through mergers.	engineers to acquire new consumer information. – Co-developing services with customers. – Including a service representative in the designing of new products.
Learning & Growth perspective	**Organizational Capital**	Service culture & internal resistance	– Statements from the CEO as a tool for developing a service-oriented culture.	– Developing specific projects to enhance the service culture. – A service management program to create a services culture. – Internal workshops, seminars and messages from upper management that promote lifecycle thinking. – Annual meetings with employees to revise and review strategy.	– Implementing specific projects to leverage service thinking. – Highlighting services through internal communication, information sessions, marketing, website communications and via company strategies. – Using upper management as a communication tool that promotes a service culture. – Select personnel who are change-drivers and bridge-builders to serve as leaders.
		Internal integration	– Forming capture team leaders who work with ad hoc teams to achieve CAPEX-OPEX optimization. – Appointing personnel who belong to several internal units of the organization.	– CAPEX-OPEX shared meetings. – Ad hoc teams of capital and service sales personnel that prepare bidding quotations. – Common databases and shared customer project metrics for sales, products, and project managers. – Transversal teams to enforce best practices.	– Including service personnel in the CAPEX-sales team. – Formal CAPEX-OPEX workshops for filling cross-functional gaps in the organization.
	Human Capital	HRM for services business & service skills	– Recruiting more staff with new skills and commercial profiles to address customers. – Implementing value-based business training for service personnel. – Training programs for linking required skills and competencies with job families. – Applying a project management gate model to the entire organization. – Acquiring companies to obtain new service capabilities.	– Recruiting solution sales personnel. – Implementing a bonus structure and allocating challenging tasks. – Training programs on preventive maintenance, service management, solution sales, asset management, process management, customer data management, and environmental issues. – Purchasing service competences through mergers. – Development discussions in place.	– Recruiting service-oriented personnel to work for service organizations. – Introducing new bonus structures for service personnel. – Training on sales. – Creating specific development programs after mapping employee talents and skills to address gaps in knowledge.
	Information Capital	Service ICT and knowledge management systems	– CRM tools contain account plans for the most relevant customers. – Remote-based monitoring. – A global ERP tool. – A reporting tool for project portfolio tracking and status reporting. – A tool for risk review, quantification and mitigation. – A tool for product lifecycle management. – A quotation system that includes a solution configurator. – A customer feedback portal.	– CRM system. – Adopting remote monitoring technologies and systems. – Sharing databases that contain all service agreements and their related documents. – Implementing a centralized and shared web-based portal containing main metrics and KPIs. – ERP system. – Using risk management models. – Reporting system for financial and account management that includes sales data and sales history records. – Using minor systems such as Click View and Note.	– Shared CRM system. – Product document management system in which all services are described. – ERP system. – Minor systems such as flow management and workforce management systems. – Operation center for the centralized collection of customer data. – Value calculator (for value-based pricing).

performance-based pricing strategies became crucial value appropriation tools for achieving solution scalability, planning resource allocation, ensuring continuous cash flows, and balancing long-term capacity utilization while reducing costs by benefiting from different drivers (e.g., accumulative learning, economies of scale and scope, and repetition). While service agreements were key to locking in customers while locking out competitors, standardization of agreements facilitated the sales process from both sales personnel and customers' perspectives.

Through the above initiatives, companies aimed to optimize asset utilization and embrace mass-customization while gaining economies of repetition, improving production agility, increasing operational flexibility and adaptability, and decreasing response times. Several IT systems were required (at the learning and growth perspective) to

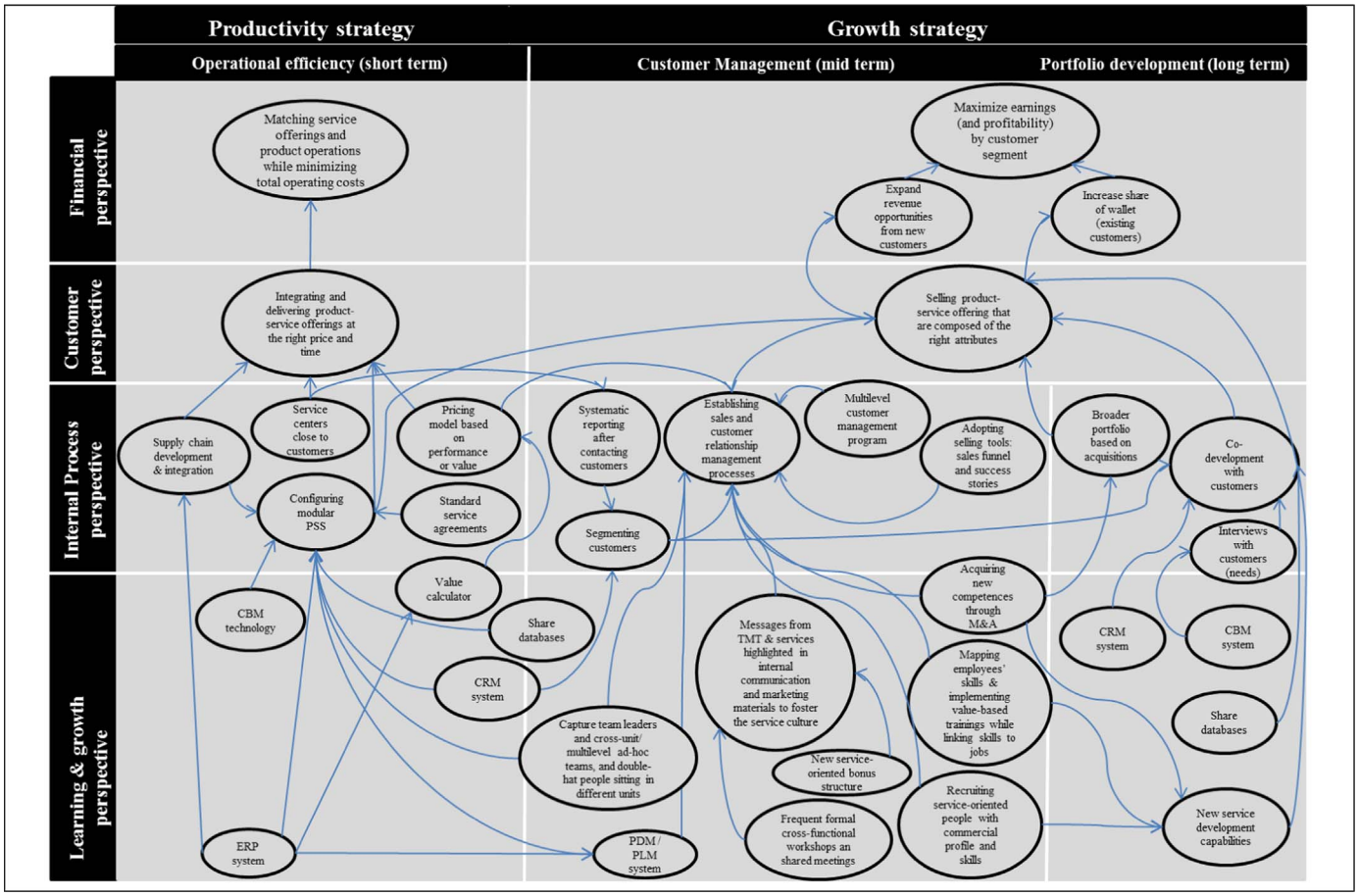

Fig. 2. Strategy map of servitization.
SOURCE: Own elaboration based on the company interviews.

support key internal processes. According to the interviewees, ERP systems help our cases combine operations in a modular manner and support solution configuration, project management (together with other specific systems), and supply chain integration. In addition, ERP systems actively share information with PDM/PLM systems. Together with value calculation techniques, these systems often play important roles in configuring and pricing offerings with minimum total costs of ownership and in communicating (demonstrating) value to customers. Technologies and systems for condition-based monitoring (CBM) not only represent important instruments that increase reliability and support risk management and cost savings by preventing unforeseen expenditures but also become novel revenue streams. Finally, companies also relied on CRMs for supporting mass service customization and project management.

4.2.2. Growth strategy and key value co-creation processes

As indicated in the center of Fig. 2, our case companies aimed to maximize earnings by customer segment. Because customers' perceived value-in-use is critical in servitization, the case companies stressed not only sales management but also customer relationship management processes, which involved diverse initiatives (at the internal process perspective) to acquire new customers and increase the satisfaction, loyalty, and wallet share existing customers to co-create value in longer-lasting and deeper relations with the most profitable customers. Naturally, accurate customer segmentation and clear segment-specific strategies help companies excel at understanding customers' needs.

The interviewees highlighted multilevel and multiunit structures for strategic account management programs (e.g., site-, key-, corporate- and strategic-account managers, as well as corporate sponsors) as playing roles in ensuring access to top managers who carry out key decision-making processes related to the acquisition or development of advanced product-service systems (Table 3). The case firms also introduced different tools to improve sales performance (e.g., sales funnels, success stories) while establishing multiple channels for accessing customers and multilevel and cross-functional sales teams to exploit cross-selling opportunities.

From the learning and growth perspective, the growth strategy called for service-oriented organizational capital readiness. To create such readiness, the case companies strongly focused on cultural management, internal relationship management, and human resource management processes. First, the companies used different practices to promote their service cultures. In addition to the intensive use of internal marketing and communication tools, companies have implemented training programs and involved employees in strategy development workshops to facilitate a shift to a service-oriented mindset. The leadership of top management teams, in particular, of CEOs, was a key to boosting organizational readiness.

A second group of critical practices was implemented to improve internal relationships between units and bridge organizational silos to facilitate information flows. For instance, the combination of capture team leaders (project owners/managers) and ad hoc cross-unit teams were stressed by the interviewees as preconditions for not only configuring and delivering offerings more efficiently but also improving sales performance by exploiting cross-selling opportunities based on both a better understanding customers' needs and early interactions of service personnel with customer representatives.

Finally, human resource management practices were also set to endow product-oriented personnel with required customer-centric knowledge and skills while aligning workers' individual goals with

Table 3
Sample verbatim extracts by strategy map perspective and theme.

Perspective		Themes	Verbatim extracts
Financial		Financial targets and KPIs	"In [*company name removed*] the most important KPIs are net sales and bookings. We target growth, and the other one is profitability. We usually talk about EBITA." (B7) "I should, of course, remember these by heart, but of course, it's the sort of order intake, net sales, EBIT, and working capital." (A2)
Customer		Main attributes of the value proposition	"I think the company's value proposition has been, and still is really, to provide the best available technology. However, if we think of the value proposition today, quality, selection, functionality, partnership. I would include those on that list." (C2) "...we highlight things, like "technology" is a keyword; "environment" is a keyword, and this, kind of, lifecycle perspective. Maybe more like a relationship, the long horizon of a relationship." (A2)
Internal	**Operations Efficiency**	Service operations organization and management	"...we had established our own business services department, which is now ready to be integrated into other businesses. The idea is to link our CAPEX with lifecycle services. We want to unify all of our services." (C2) "...we launched a major transformation program [*name removed*], which we merged into what we then called end-to-end operations. End-to-end includes R & D, production, sales, and in some cases, services. We did not carve out services from those businesses and then dedicate them to a service division. The service operation is still embedded in those lines of business." (A2)
		Supply chain development and integration	"...we hadn't even developed a delivery process for spares or services five to ten years ago, and now, they are described as our core processes. Therefore, there has been a major change there. We are still implementing them, so we have a program that implements them as needed." (C2) "...during operations and service delivery processes, the supply chain is very important. Actually, now we focus more on our services supply chain, especially in the areas of raw materials, spare parts, etc. You can develop these processes in the same way you develop the supply chain of any capital operation..." (B7) "...five years ago, we had a considerable drive to create this global supply management organization. However, we realized over the years that the disadvantage of this approach is that it is very detached. So, in a value chain, where a significant proportion actually comes from your sub-supplier, breaking down the cost of the product reveals that you are not in control or accountable. A year ago, we actually decided to break this process up, and we put it back into the business lines." (A2)
		Project and risk management	"...we managed to create a risk-management system through which we can plan, for instance, guarantee times..." (B4) "...we have protocols in place so that if the project reaches more than [*threshold removed*], documentation and risk management processes must be applied." (C2) "...we have had, for years, this kind of corporate Project Management Office to collect and roll out the best project management framework and skills. We have a gate model, which is common in the whole company. The risk management of the project, the risk review and also the quantification and mitigation activities are managed through this project portfolio tracking tool." (A2)
		Service delivery and network	"...we have to have a very extensive network for delivering field services and workshop services to our customers...most of the specialists [team leaders or supervisors] are our own; for the blue-collar personnel, we mostly don't have our own staff, so there are external companies that we use." (B7) "...we decided that we want to operate our own service networks all over the world. I think at least for me, the biggest advantage we have over our competitors is that we are really global and we have our own people." (A4)
		Offering standardization and modularity	"A solution needs to be developed from ready-made solutions, if you can call it that. You must have Lego pieces..." (A3) "...we have been able to modularize our core products, enabling simplified and agile production..." (C1) "...we will be able to expand our business and enjoy better, let's say, business predictability if we have agreements." (A5)
Internal	**Customer Relationships**	Customer relationships	"...so we have different persons engaging with customers, customer service engineers, production line sales persons and, at the higher level, service managers, etc....the aim is to have multiple points of access and channels to customers...through this, we also gain an understanding of how customers make decisions." (C1)
	Portfolio Development	Portfolio development	"We need to have a broad portfolio composed of various types of services. That's why these acquisitions have been completed." (A8) "Through mergers, we have created a broader service portfolio." (B5) "...our job is exactly to come up with the solutions for our customers. That means that today we do quite a lot of what we call co-development with the customers." (A7) "...many of the good service innovations come from the customer interface, not so much from the research center. We have, if we think of the activities we've done and changes to the processes, really tried to get all those innovations and best practices from the frontline." (C2)
Learning & Growth	**Operations Efficiency**	IT systems for service operations management	"The CRM, ERP, and PDM systems are the three core systems, but we also have many smaller support tools, such as flow management systems and workforce management systems. However, we do not have a single tool...." (C2) "In spare parts, we follow the back-log on daily basis... We make predictive decisions based on data." (C7)
	Customer Relationships	Service culture	"...there is a strong focus on developing a services business culture and on leading through real leadership. The [*name removed*] program was again quite a strong initiative in that respect." (B7) "We started the [*name removed*] project to leverage services-related thinking in all departments that are connected to our machinery in delivery, installation, start-up and maintenance." (C1)
		Internal relationships	"...from the product side, each sales project has own sales manager, and then we [services] nominate a project manager. However, we have a number of people who are communicating actively with the product sales managers and project managers. The idea is that, together with product unit, we define what can and should sell, and then, we make the plan for how we are going to make the sale in this case. There is a process to initiate this sales case, but it is ad hoc, case by case." (B7)
		Skills and competences	"Among the initiatives and activities that we have implemented, the biggest has focused on employee knowledge mapping. This included matrices of technologies and skill sets. Once we had identified gaps, local units developed a plan to address those gaps." (C2) "...a transformation program that we ended up calling [*name removed*]. We also connected it to competences and job families." (A2) "We have recruited solution sales personnel because not everyone can do this job based on their previous

(continued on next page)

Table 3 *(continued)*

Perspective		Themes	Verbatim extracts
			competencies. However, we also offer practical internal solution-sales training. Sometimes we also acquire these competencies through mergers." (B5)
			"…we have recruited many personnel to the services organization in the last five years but also made many acquisitions—I think almost 10 acquisitions, which are more or less services-related—and that has been a quick way to get services-oriented people with a service mindset in the company." (C2)
			"…it is risky to take a top-notch engineer and then say, 'Now you're going to be a sales manager.' It does not necessarily work. You must recruit new people with the new skills that you need." (A9)
		IT systems for customer relationship management	"We have algorithms in our delivery chain to prioritize customers, and for the less critical customers, we offer account sales coordinators who remotely provide on-line services, digitalized and technical services, and support centers. This is a good contact with customers, but more lean from the profitability point of view." (A11)
	Portfolio Development	IT systems for portfolio development management	"…every time a salesman or an expert visits a customer, they create a call report of that meeting or what they did there, and then, we have the CRM system that includes those call reports." (B7)

the unit's goals by setting the right incentive structure to stimulate them to devote more time to profitable customers. Servitization requires a complete understanding of the solution business to sell and integrate the right value proposition for each customer segment, which according to the interviewees, includes not only deep knowledge of product-service portfolios from a 'hard' technical perspective but also customer-oriented 'soft' skills (e.g., consulting, value-based selling and marketing competences). Therefore, the companies typically implemented a service-oriented bonus structure and completed comprehensive analyses of available and necessary skills while designing specific training programs on value-based sales and services management.

Hiring new service-oriented personnel with commercial skills and acquiring service companies also emerged during the interviews as means of obtaining skilled human resources. However, in the latter case, the integration of human resources from acquired companies and the harmonization of processes were major challenges.

In all of the cases, CRM systems were at the core of ICT investments because they support customer segmentation and provide a considerable amount of data regarding customers' current and potential demands while allowing service personnel to develop a shared understanding of offerings and customer records of accomplishment that support the initiation of new sales processes. CRM systems were typically fed by a systematic reporting after each interaction with customers. Of course, companies may vary their IT tools by customer segments. As expressed by one Service Director, Case A uses algorithms to prioritize customers. For less critical customers, the company implemented a wide range of on-line services, digital and technical services, and remote support centers.

Because of direct contact with customers, field service personnel play a fundamental role as sources of information. Thus, the ability to collect first-hand information was increased by the existence of broad service networks and service centers close to key customers. In addition, technologies and systems for CBM provide valuable data on product performance and customers' habits when using the product, whereas the implementation of shared databases can facilitate the use of information by improving internal relationships and bridging organizational silos.

4.2.3. Growth strategy and key value co-production tools and processes

As indicated in the right-hand side of Fig. 2, a long-term growth strategy called for diverse portfolio development at the internal process level. As described by our interviewees, the strategy called for broadening the portfolio of product-related services through new investments, acquisitions and co-production with customers (Table 3). First, because acquisitions typically included product companies (competitors and complementary products) and their service businesses, these initiatives helped expand service revenues from new customers by increasing the installed base.

Finally, service innovation emerged from customer interactions, which enable product and service development departments to better understand customers' business and needs. To support co-development, different encounter mechanisms (e.g., interviews, workshops, and piloting with key customers) were implemented to find the right offering for each targeted customer segment. While the required new service development capabilities were in many cases developed (at the learning and growth level) through internal training, external recruiting, or company acquisitions, interviewees also identified key technologies to support portfolio co-development, including CRM and CBM systems and databases to increase suppliers' understanding of products' performance and customers' experiences when using the products.

5. Conclusions

5.1. Theoretical implications

The present study was conducted to understand the strategic logic manufacturers use when implementing servitization strategies. The contribution of this study is threefold. First, it identifies the components of strategy and improves understandings of the linkages among the components during servitization (Alghisi and Saccani, 2015; Martinez et al., 2010). Second, this study advances the understanding of the processes of value creation and appropriation, which were recently cited as gaps in the literature (Visnjic and Van Looy, 2013). Finally, this study extends recent debates on service-based business models (Kindström, 2010; Kindström and Kowalkowski, 2014; Kujala et al., 2010; Storbacka et al., 2013; Visnjic et al., 2013) while discussing how companies combine different elements to exploit cost and value drivers and create competitive advantages.

Regarding the first contribution, the representation of core activities through the strategy map improves the understanding of the strategic logic behind servitization. The proposed holistic approach to the servitization activity system—based on processes, activities and resources—contributes to a better understanding of both the sources of servitization-driven competitive advantage and the link between strategic choices and performance logics for successful servitization, which often take place simultaneously, as suggested by the ambidexterity literature (Raisch and Birkinshaw, 2008): 1) profit-based exploitation and 2) growth-based exploration. Hence, further understanding servitization from a strategic perspective requires a holistic approach to the relevant components. When taken together, these can influence strategy implementation, which is both deliberate and emergent, requiring planning and strategic learning (Mintzberg and Waters, 1985; Sirén and Kohtamäki, 2016).

Regarding the second contribution, we theoretically distinguish among three central sets of processes: 1) value co-creation and relationship management, 2) value co-production and innovation and 3) value appropriation and productivity. Concerning value co-creation,

our data illustrate how companies organize sales and customer management processes to focus on securing revenue streams and building long-lasting, lucrative relationships with existing customers to increase customers' share of wallet (Kaplan and Norton, 2004b). Companies use value-based argumentation to support sales strategies, such as customer product lifecycle cost reductions or productivity increases, to highlight the value of new solutions. Our data also demonstrate the importance of certain logics in the facilitation of sales growth, such as strategic account management programs and broad access to customer organizations. Practices for quantifying and visualizing value are needed in addition to sales teams that are motivated to identify profitable solutions.

Defined as *"participation in the creation of the core offering itself…"* (Lusch and Vargo, 2006: 284), value co-production initiatives associated with portfolio management processes allow companies to co-develop better offerings with customers and distinguish themselves from competitors. Thus, companies can increase customer loyalty (and share of wallet) and develop novel revenue-generating mechanisms that can be extended to new customers. These mechanisms might help companies increase their market share and achieve greater economies of scale and scope, and consequently, higher margins and growth in the long term (Kaplan and Norton, 2004b). In addition, this study identifies core processes that enable value appropriation via key strategic actions through which firms intend to maximize the profitability of advanced services.

For instance, value co-creation and co-production processes enhanced the customer proximity of our case companies, which in turn improved the complementarity of products and services while increasing product-service system sales growth and decreasing costs via economies of scale (Visnjic and Van Looy, 2013). Often facilitated by service agreements, which allow manufacturers to lock-in customers and lock-out competitors, the actions taken by the studied manufacturers to manage service operations, supply chains, and risks generated virtuous circles from larger economies of scale and lower operation costs. These processes contribute to cost control and efficient asset utilization while enabling the delivery of products and services of adequate quality at affordable prices (Kaplan and Norton, 2004b). Cost effectiveness also may lead to "demand-side economies of scope" (Visnjic and Van Looy, 2013: 171), which allow manufacturers to prevent what Storbacka et al. (2013: 710) referred to as "unbundleability" and to increase the price of a system. The actions of the case companies are also aligned with the findings of Baines and Lightfoot (2013), who concluded that combining appropriate pricing with effective cost and risk management is key to maintaining profit levels.

Finally, the processes and actions identified in this research clarify and deepen the evidence on the four interrelated generic continua suggested by Storbacka et al. (2013) as the constituents of business model configuration in servitization. The case companies have attempted to find configurational fits via the following actions: 1) building relational long-term ties with customers through relationships, sales, and portfolio management actions (customer embeddedness); 2) integrating complementary and interoperable product-service systems through portfolio, internal relationships, and delivery management activities (offering integratedness); 3) absorbing and transforming customer knowledge into adapted and cost-effective service solutions through service delivery, supply chain, risk, and internal relationship management practices (operational adaptiveness); and 4) harmonizing and integrating internal and external processes through supply chain and internal relationship management actions to achieve intra- and inter-organizational integration (organizational networkedness). Furthermore, the empirical evidence clarifies the interplay among these four continua and illustrates which intangible assets are essential when seeking strategic fit.

5.2. Managerial implications

The outcomes of this study can guide company managers who are seeking to define servitization strategies and business models. In particular, this research provides valuable information for industrial firm managers by outlining relevant practices that must be considered when developing manufacturing company strategies. Although we agree with Gebauer et al. (2012: 124), who highlighted the need to engage "manufacturing companies in creating services with novel business models," we also concur with Kindström and Kowalkowski (2014: 106), who stated that "…the initial step in business model innovation is to determine the current situation and identify the target position, which presents the 'big picture' and supports a discussion of what the business model should look like, once the target position is reached." In this regard, the strategy map might be a valuable practical tool.

By benchmarking our results, the strategic logics behind servitization can be elucidated. In particular, this study provides information about practices that enable implementation of servitization strategies. An improved understanding of strategic logic and practice is valuable for business development directors and managers who are responsible for servitization processes. These findings also support the recognition of servitization needs. Indeed, we believe that these results may serve companies that are undergoing various phases of servitization. For firms in the initial phases of servitization, these results and the described strategy map provide the means to facilitate long-term value creation and appropriation. For manufacturers in more mature stages of servitization, these results may offer guidelines for re-inventing servitization strategies. In any case, managers have to be aware that the implementation of complex business models that involve ambidexterity, such as servitized business models, is never free of tensions and paradoxes (Smith et al., 2010).

5.3. Limitations and suggestions for further research

The series of potential activities that support business models may be vast (Porter, 1996; Zott and Amit, 2010). Our study only examines the activities and processes mentioned by our interviewees as relevant to the implementation of their industrial services strategies. Because more interviews produce more nuanced data, we continued to conduct interviews until we felt that a sufficient variety of perspectives had been covered. Although this approach may have produced varied data and perspectives, we feel that we have communicated our main results with sufficient clarity to include nuanced perspectives. This study sacrificed result generalizability due to the use of case data; therefore, future studies may operationalize processes and activities to examine performance effects using quantitative data. Future studies may thus identify causalities using larger datasets.

This study focuses on project-based servitization. However, companies may follow parallel servitization paths involving specific business models for different customer segments (Kindström and Kowalkowski, 2014; Kujala et al., 2010; Paiola et al., 2013), which is aligned with the idea of combining varying degrees of change in different dimensions to find the configurational fit to implement different business models (Storbacka et al., 2013). Therefore, future studies may focus on mapping processes, actions and practices for different service strategies in different types of companies.

We suggest that further research must be conducted on strategy maps to test and develop the identified processes, resources and competence logics. Although we believe that strategy mapping is an important methodology, further refinement is needed. We recommend the upgrading of the model to improve integration with resource-based views. In future research, we suggest the adoption of Long and Vickers-Koch's (1995) perspective that companies use processes and management systems to generate value via resources and competences. Therefore, processes and related management systems, such as per-

formance management systems, IT systems and organizational cultures, are considered characteristics of process organization (processes) that enable customer value creation or co-creation based on resources and competences. Thus, we would define the lowest perspective of the strategy map as an outline of resources and competences, whereas the second-lowest perspective includes processes, activities and structures (including the management system, IT system, and organizational culture perspectives).

In addition, the strategy map applies a highly rational approach to understanding companies' strategies while positioning the analyses at the organizational level. Therefore, to better understand the implementation of service-based strategies, future research may adopt micro-level perspectives (or multi-level perspectives) while using psychological and sociological approaches to explain how implementation processes and their outcomes are influenced by individual perceptions, behaviors, and interactions among individuals (Floyd and Wooldridge, 1992; Jarzabkowski, 2008). Servitization research would benefit from research on strategy implementation characteristics at the micro level.

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