FIRM BOUNDARIES IN SERVITIZATION

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ABSTRACT

Manufacturers implementing 'servitization' strategies must change every dimension of the business models. While analyzing repositioning, previous research has overlooked the firm boundary delineations related to servitization. Thus, the present study aims to increasing the knowledge on how does the transformation toward customer solutions influence manufacturers' organizational boundaries? This study contributes to the intersection of industrial services and firm boundary literatures. Based on a multiple-case study of four Finnish manufacturing corporations that have been implementing servitization strategies successfully, this study analyzes case companies' repositioning moves within the industry value system through different adjustments in the organizational boundaries. As main contributions, this study 1) highlights different drivers for re-positioning towards the downstream when servitizing a manufacturing company; 2) provides necessary understanding about the mechanisms that take place when changing the organizational boundaries, which were explored by application of three firm-boundary theories (identity, power, and resource-based view); and 3) underlines the interplay of different firm boundary theories when implementing the service transition.

Keywords: Firm boundaries, customer solutions, servitization, industry architecture.

Competitive paper

ACKNOWLEDGEMENTS

This paper is a product of the FUTIS, and FIMECC S4fleet research projects. The financial support of the Finnish Funding Agency for Technology and Innovation (TEKES) and the Federation of Finnish Technology Industries is gratefully acknowledged.

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INTRODUCTION

Previous research illustrates how iconic global manufacturers, such as IBM, GE, Rolls-Royce, and Caterpillar, have migrated toward customer solutions (Davies 2004; Foote et al. 2001; Koudal 2006; Auguste et al. 2006; Gerstner, Jr. 2002). Typically referred to as servitization (Vandermerwe & Rada 1988), service infusion (Brax 2005; Kowalkowski et al. 2012), or service transition (Gebauer et al. 2011), this value migration involves a complete redefinition of the organizational identity of manufacturing companies (Jacobides & Winter 2005). Manufacturers must re-position in the value system by moving closer to the end customer while meeting their changing needs with new innovative business models (Wise & Baumgartner 1999). But then, because resource configurations are contingent to a particular business model, they have to realign resources and activities while redefining their horizontal and vertical scopes to build a unique position (Porter 1991). Thus, implementing new business models requires the redefinition of the horizontal and vertical organizational boundaries (Chesbrough & Rosenbloom, 2002; Teece, 2007), which can be respectively defined as "the scope of product/markets addressed" and "the scope of activities undertaken in the industry value chain" (Santos and Eisenhardt 2005: 492).

Re-positioning within the value system to implement servitization will change the organizational boundaries of manufacturers (Gebauer et al. 2012; Chandraprakaikul et al. 2010). Previous studies conclude that manufacturers have used alternative repositioning practices, such as focusing on product-centric services while keeping a tail in production operations, or on combining original equipment manufacturer and product-centric services (Baines et al. 2011). Davies et al. (2007) also distinguish between system sellers and the system integrators. Whereas drawing typically upon operations management- and marketing-based concepts, and the capability literature, research on industrial services somehow neglects the debate of boundary demarcation as repositioning mechanism. Whereas calling for the application of interdisciplinary perspectives based on general management theories, Gebauer et al. (2012: 127) suggest that, for instance, servitization "can be considered from the perspective of the boundary of the firm". There is a need to examine the influence of servitization on organizational boundaries while accurately analyzing both the impact on companies' scope and the mechanisms that companies use for repositioning within the value system.

The present study extends recent research on firm boundaries in servitization (Salonen & Jaakkola 2015; Rabetino & Kohtamäki 2013) while analyzing the implications of the service transition on organizational boundaries redefinition by answering the following research question: how does the repositioning during the transformation toward customer solutions influence manufacturers' organizational boundaries? We address this question by using a multiple-case study to analyze the servitization of four Finnish global corporations. Following the existing research on organizational boundaries (Coe et al. 2008; Sturgeon 2008; Santos & Eisenhardt 2005), this article considers the interplay of different approaches to analyze firm boundary outlining for manufacturers' repositioning during servitization. This study contributes to the industrial service literature by 1) highlighting different drivers for re-positioning towards the downstream when servitizing a manufacturing company; 2) analyzing the mechanisms that take place when changing the organizational boundaries; and 3) underlining the interplay of different firm boundary theories when implementing the service transition. For managers, this study provides framework to analyze and benchmark practices related to manufacturers' boundary delineations.

THEORETICAL FRAMEWORK

Gaining above average returns has traditionally been the Holy Grail in strategy debates. In this context, the idea of competitive advantage has stimulated a form of veneration in strategists (Christensen 2001). Besides the industry related structural forces, the root of competitive advantage can be found in the manner a firm positions itself in any particular industry, which ultimately explains profit differences vis-à-vis its rivals (Porter 1980). A specific relative position is the outcome of combining a unique value proposition for customers within particular vertical, horizontal, and geographical scopes (Porter 1991). However, positioning is not a static concept; competitive dynamics frequently force companies to seek new sources of competitive advantage, which may involve finding a new position in the value system while not only adjusting their scope and their boundaries, but also realigning their resources, activities and value propositions.

Offering customer solutions as a new source of competitive advantage

Service transition forces manufacturers to take a broader view of their industry (Wise & Baumgartner 1999) while repositioning themselves within a dynamic value system (Gebauer, Paiola, and Saccani 2013). This strategic move typically requires developing new capabilities (Davies 2004) and value propositions while learning to provide services (Lusch et al. 2010). Repositioning may take different alternative forms. Manufacturers can focus on product-centric services while keeping a tail in production operations, or on combining original equipment manufacturer and product-centric services (Baines et al. 2011). Davies et al. (2007) define two positioning practices by distinguishing between the vertically integrated system sellers that produce all the components in a product-service system, and the system integrators that organizes the integration of modular parts supplied by third parties. For instance, system integration allows manufacturers to "shape their boundaries and their position in an industry value stream" while "enabling them to decide who to compete with, who to collaborate with, what to make in-house, and what to outsource" (Hobday et al. 2005: 1136).

Organizational boundaries in service infusion

Repositioning involves boundary (re)definition (Chandraprakaikul et al. 2010; Teece et al. 1997), which in servitization may implicate designing a proper product-service offering and deciding what value-adding activities should be performed internally and which should be outsourced to suppliers, partners, distributors, and/or customers (Baines et al. 2005). Understanding organizational boundary delineation requires the simultaneous use of multiple interdependent, complementary and synergetic theoretical lenses (Brahm & Tarzijan 2012; Yang et al. 2010; Poppo & Zenger 1998; Schilling & Steensma 2002). Following Santos and Eisenhardt (2005), this article applies power, competence, and identity conceptual perspectives to analyze the redefinition organizational boundary resulting from servitization strategies.

Corporate identity and firm boundary definition in service transition

Offering "customer solutions embody the new service dominant logic" (Tuli, Kohli & Bharadwaj, 2007: 1). Manufacturers must re-consider almost every aspect of the way they do business (Brady, Davies, & Gann, 2005: 364) to facilitate the creation of value-in-use for customers (Baines et al. 2007; Johnstone et al. 2009). Thus, moving toward a service- and customer-centric logic (Galbraith 2005; Galbraith 2002) forces manufacturers to redefine their identity (Jacobides & Winter 2005), which was originally defined as the manner in which organizational members answer relevant questions such as "who are we as an organization?" and "what kind of organization is this?" (Gioia & Thomas 1996; Livengood & Reger 2010; Albert & Whetten 1985). When offering customer solutions, answering such questions may require balancing elements from both a goods- and a service-dominant logic (Windahl & Lakemond 2010).

Because "identity emerges from the process of organizing" in which multiple identities are simultaneously involved (Clegg, Rhodes & Kornberger, 2007: 497), the impact of the service transition on the organizational identity is unpredictable. In a starting stage, however, the service transition will, at least, redefine the corporate identity, which is often expressed in public an accessible forms and can be defined as the "identity attributed to an organization" by the corporate management (Rodrigues & Child, 2008: 886). Strategically redefining firm's corporate identity will comprise major organizational changes (Clark et al. 2010), which will involve the redefinition of the organizational boundaries. While this type of transformation typically begins with a new strategic vision/mission (Gioia & Thomas 1996), "top managers may try to foster an organizational culture that lends credibility to their desired corporate identity" (Rodrigues & Child, 2008: 890). Because strategy is a representation of the firm's identity as defined by the firm's boundaries (Kogut 2000), during service infusion a manufacturer must redefine their organizational boundaries to accomplish the required consistency between the new "identity of the organization and its activities" (Santos & Eisenhardt, 2005: 500). Thus, a new organization's identity pushes crucial strategic boundary choices, such as "whether to make an acquisition, enter a new market, or divest a division" (Tripsas 2009: 441).

Capabilities and firm boundary definition in service transition

To effectively execute a solution provider strategy, manufacturers must move downstream closer to the end customers (Wise & Baumgartner 1999) while leveraging a set of existing and additional resources and capabilities (Hobday et al. 2005; Davies 2004; Ulaga & Reinartz 2011) and balancing between generic- and specialized-related capabilities (Ceci & Masini 2011). Naturally, technological capabilities are a necessary condition when providing complex solutions (Ceci & Prencipe 2008; Davies & Brady 2000). In addition, besides the capabilities to coordinate with suppliers (Ceci & Prencipe 2008), and both customer partnership (Shepherd & Ahmed 2000) and relational capabilities (Matthyssens & Vandenbempt 2010; Kowalkowski et al. 2013; Kraatz & Zajac 2001; Tuli et al. 2007), the provision of customer solutions calls for new specific resources and capabilities such as system integration and project management, IT systems, consulting, financial competences, delivery, and post-sales service capabilities (Baines et al. 2011; Brady et al. 2005; Davies 2004; Prencipe 2003; Osegowitsch & Madhok 2003).

Following the Resource-Advantage theory, Raddats, Burton and Ashman (2015) suggest that firms develop capabilities that enable successful services through resource reconfigurations. Ulaga and Reinartz (2011) conclude that to leverage these distinctive resources, successful firms build five critical capabilities: 1) service-related data processing and interpretation capability, 2) execution risk assessment and mitigation capability, 3) design-to-service capability, 4) hybrid offering sales capability, and 5) hybrid offering deployment capability. According to Mathieu (2001), the development of the required capabilities may take place within a range that includes internalization, partnering and outsourcing. Among the benefits of collaborative forms, Paiola, Saccani, Perona and Gebauer (2013: 395) highlight "sharing of risks, accessing essential resources and skills in building a competitive advantage, and moderating the political costs of entering the service business". From this viewpoint, organizational boundaries are "dynamically determined by matching organizational resources with environmental opportunities" (Santos and Eisenhardt 2005: 497).

Industry control and firm boundary definition in service transition

Whereas extending product offerings by adding services, manufacturers have to move vertically (Hax & Wilde II 1999; Davies et al. 2006; Wise & Baumgartner 1999) to protect their strategic domain (Cacciatori & Jacobides 2004). On the one hand, offering complex services successfully requires certain degree of control over the service value chain (Raynor & Christensen 2002). In addition, providing solutions successfully also requires ensuring certain product specifications and warranting system compatibility and performance (Osegowitsch & Madhok 2003) while adjusting services to meet customers' needs (Davies 2004). These crucial concerns highlight the relevance of controlling how subsystems are coupled and related processes organized (Baines et al. 2011). Because vertical integration is a manner of guaranteeing that product specifications and services can be adjusted to diverse customer needs (Davies 2004), mergers and acquisitions seems to be a common pattern for manufacturers when moving downstream (Osegowitsch & Madhok 2003). However, the internalization of uncertainty and the governance of the value system may also be attained effectively without full ownership by employing alliances, joint ventures, and licenses (Harrigan 1984; Mahoney 1992; Porter 1980; Pfeffer & Salancik 1978). Following (Mathieu 2001), Paiola et al. (2013) suggest that using collaborative options when entering the service business may moderate the political cost among partners, customers, traditional service providers, and also other manufacturers.

Employing whichever control mechanism, understanding the sources of industry control entails an accurate analysis of the distribution of power (Sturgeon 2008; McGahan 2000) to identify profitable industry "bottlenecks" (Grant, 2010:82), which implies answering questions such as how the value system is governed (Adams & Brock 1982) and how the inter-firm division of labor is organized within the value system (Gereffi et al. 2005; Gereffi 2001). Achieving industry dominance requires redefining roles and responsibilities by examining other players' needs, and becoming a less replaceable bottleneck (Jacobides 2011). Whereas companies move within the industry value system to increase their governance over strategic relationships, knowledge (Garud & Kumaraswamy 1993) and resources, organizational "boundaries determine the sphere of organizational influence, including its degree of industry control and its power over the external forces" (Santos & Eisenhardt 2005: 491).

RESEARCH METHODOLOGY

Research strategy

Using a multiple case-study methodology, the present study intends to provide an analysis with replicable, reliable and robust results (Eisenhardt & Graebner 2007) of manufacturing corporations' strategic transition from products to services and customer solutions during 2000-2015. To understand how the case companies shaped their firm boundaries, we arranged a longitudinal and retrospective research design that comprehensively identifies multiple boundary moves during the investigated time-period. This protocol required that we studied corporations with extensive archival histories and secondary data. With intention to study in-depth how servitized manufacturing corporations act in terms of their boundary delineations during their strategic transition, the unit of analysis in this study is the focal companies' boundary moves.

Case selection

Following a straightforward purposeful sampling selection method (Patton, 2002), four servitized manufacturers from four different industries were taken under careful study to understand required re-positioning within the value system. The four equipment manufacturing sectors are: 1) energy systems, 2) mining, 3) heavy equipment and 4) construction industry. As selection criteria, we focus on manufacturers that 1) are public companies listed in Nasdaq OMXH, which facilities the collection of public data, 2) are market leaders in their own industries with regards their market position and business performance, and 3) have been actively moving toward solutions while claiming that services play an important role with regards the strategy. Therefore, the chosen corporations provide uncommon research access (Yin 1994; Eisenhardt & Graebner 2007) and are suitable cases to analyze how these firms have delineated their organizational boundaries while shifting their position within the value system. Table 1 summarizes firms' details and collected primary and secondary data.

Data collection

To analyze how the case companies have re-positioned along the value system, we conducted 29 face-to-face interviews between years 2010 and 2014 (Table 1). Respondents were selected based on their senior management positions, experience from developing service and solution businesses or responsibility of developing certain business unit or relationship. Both 23 internal and 5 external respondents were utilized because of the need to triangulate the data for increased reliability and accuracy. Interviews ranged from 40 to 105 minutes and all of the interviews were audiotaped and transcribed verbatim with interviewees' permission, resulting in approximately 500 pages of transcribed text. In addition to primary data, an extensive secondary data collection was conducted, including analysis of annual reports, press releases and firm histories to cover issues that were not covered during the interviews.

Table 1 Case description and sources of information

	CASE A	CASE B	CASE C	CASE D
Turnover € (2014)	4.7 billion €	1.4 billion €	2 billion €	7 billion €
Service share (2014)	41 %	36 %	42 %	45 %
Industry	Energy	Mining	Heavy industry	Construction
Core products	Propulsion systems and power plants	Minerals and metals processing technology	Industrial cranes and Lifting systems	Lifting equipment
Core services	Integrated solutions, Service agreements, spare parts, maintenance, O&M, modernization	Turnkey solutions, spare parts, maintenance, O&M, modernization	Service contracts, spare parts, maintenance, modernization	Service contracts, modernization, turnkey solutions, maintenance, spare parts, people flow analyses
Archival data - Presentations in investor meeting -Histories -Press releases -Annual reports and financial statements (2000-14)	1 (CEO) 1 history (311 pages) 1 (VP, Service Unit) 20 documents of press releases 2533 pages of annual reports	1 (CEO) 900 pages of annual reports	2 (CEO) 2 histories (676 pages) 403 documents of press releases 1388 pages of annual reports	2 (CEO & Chairman of the Board) 4 histories (1593 pages) 273 documents of press releases 1037 pages of annual reports
Number of interviews	10 interviews (161 pages)	7 interviews (109 pages)	7 interviews (141 pages)	5 interviews (89 pages)
Internal interviewees	1) Pricing Manager, Services 2) VP1, Integrated Solutions 3) Director 1, Project Management 4) VP2, Product Business Unit 5) Director 2, Strategic Business Development 6) Director 3, Business Intelligence 7) General Manager 1, Agreements 8) Director 4, Logistics 9) VP3, Services 10) Director 5, Key Account Management	1) Product Service Support 2) Manager Head of Services 3) Specialist, Life Cycle Costing 4) Director, Strategy & Sales Development 5) Product manager 6) Pricing manager	1) Service director 2) Area manager 3) District manager*2 4) Director of product and services development	1) Area manager 2) Service manager 3) Service development director
External interviewees	None	7) Supplier interview (Market manager)	5) Customer interviews (General manager, product manager) 6) Supplier interview (Global Key Account Manager)	4) Customer interview (director of procurement) 5) Supplier interview (Key Account Manager)

SOURCE: Our own elaboration based on companies' annual reports and interviews.

Analysis process

Content and thematic pattern-matching (Yin 1994) were employed when analyzing the data. The three co-authors of this article read and discussed the data to discover patterns and identify differences across the cases. First, a within-case analysis of each corporation was constructed to understand how each corporation's economic performance had developed during the investigated time-period (2000-2015). In these analysis, not explicitly reported in this manuscript because of word-count limitations, a detailed analysis was received on how a company's revenues, profitability, service business, installed base of products and number of personnel had evolved during the corresponding time-period and how servitization had been progressing. In addition, a spreadsheet program (Excel) was used to list all of the corporations' reported investments, divestments, joint-ventures, acquisitions, stake-ins, alliances and license-agreements. This was followed by analysis of how each corporation's identity, power, resources/capabilities and transaction-costs had changed during the time-period. Second, a cross-case analysis was constructed to discover patterns and variety across the cases in terms of identity, power, and resources (Beverland & Lindgreen 2010; Eisenhardt 1989; Huberman & Miles 1994). In this analysis, decided theories were used as main categories and sub-categories, to identify reasons and mechanisms behind re-positioning in servitization.

THE PRIMARY DRIVERS FOR REPOSITIONING DURING THE SERVICE TRANSITION

The case companies focus on system integration; which means assembling and testing systems while outsourcing subsystem and component manufacturing. Whereas typically taking this as a first step toward customer solutions, alliances and joint ventures are common coordinating mechanisms in the upstream end, which simultaneously allowed companies to minimize the transaction costs and exploit potential localization advantages in cost-competitive countries (Figure 1). While becoming a strategic area, procurement was centralized to suppliers. Because this situation may increase the subsystem suppliers' bargaining power, case companies have to develop a strong supply base while finding mechanisms to limit suppliers' bargaining power and cope with dependence and transaction cost. The trend seems to be the adoption of a hybrid form between a vertically integrated system seller and agnostic system integrator that combines the benefits of both models (Davies et al., 2007).

> "It's going to happen as in the car industry in the beginning of the 70s. The car industry started to buy and create system suppliers, and they continue to develop it, of course." (Director, Case A)

> "We are transforming us from a regional buy-make-sell model to a global buy-move-make-move-sell anywhere mode." (CASE C's Annual report 2006: 11)

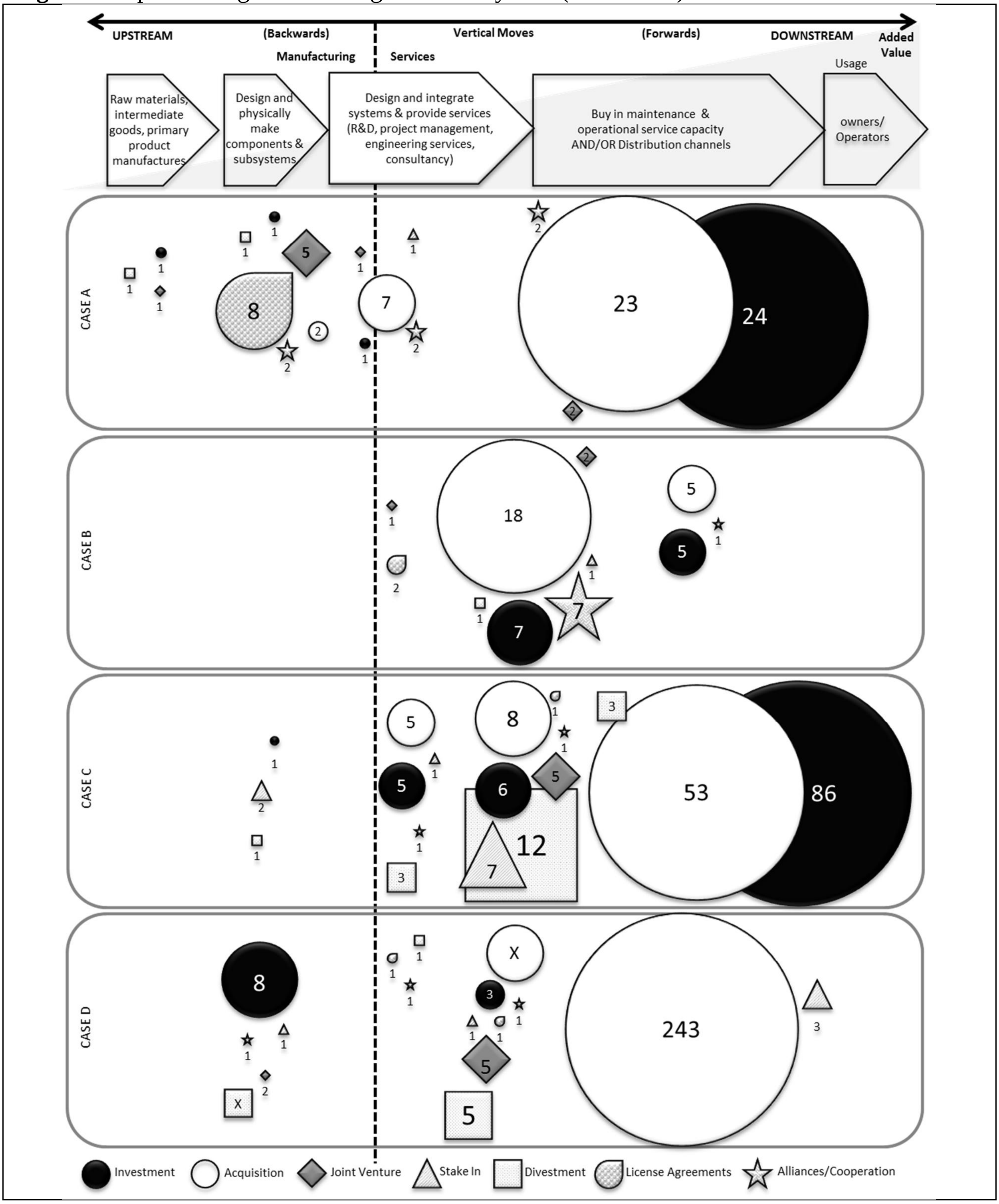
Some of the initiatives implemented by the analyzed companies include simple rules such as any supplier's sales to the company can only account for 20-50% of its total sales, and also other mechanisms such as facilitating the development of key suppliers or using dual sourcing policy for key components. Of course, in any case companies have to safeguard intellectual property rights, particularly to protect their spare parts business:

“We won’t progress if we don’t get the IPR’s for us. Simply, if we make an agreement with a software company, we have to get a right to make a patent of it if we need and want to. None external company can possess rights related to our core business.” (Head of Business Development, CASE C)

“I don’t think that that has been a strategy to buy part providers. It has been more to outsource. Of course, it can be a problem. So, we are using other suppliers too [dual sourcing] … so it’s a certain contract with a supplier, and they have to sign for the intellectual property (IP) rights … but if it’s their invention, then it’s of course their product.”(Director, CASE A)

“CASE C currently works with 13,000 active direct material, project, service and indirect suppliers all over the world who act as extensions of our own company. We have been developing our supplier base by decreasing the number of suppliers, and continue to engage them in responsibility work. At the moment, 250 suppliers provide us the central supplier base, and these are the ones we concentrate especially on.” (CASE C’s Annual report 2014: 32)

Figure 1 Repositioning moves along the value system (2000-2014)



SOURCE: Our own elaboration based on companies' annual reports.

In contrast, the level of vertical integration increases in the downstream end. Although companies not often use alliances, licensing agreements, and joint ventures, the new investments, acquisitions, and stake-in are clearly the preferred mechanisms to acquire the required service-related knowledge, capabilities, and operative capacity for service delivery while building a proper service networks. The collected data demonstrates that not only the need for diversifying the industry risk, broadening the installed base, and being closer to customers while packaging services for higher margins, but also the attempt to safeguard strategic domain and leverage capabilities lead case firms to move vertically (Hax & Wilde II 1999; Davies et al. 2006; Cacciatori & Jacobides 2004; Wise & Baumgartner 1999).

> "Through acquisitions, CASE B strives to increase its sales, strengthen its market position, add resources and know-how and expand its technology and service offering. Furthermore, acquisitions can be focused on areas that reduce CASE B's sensitivity to fluctuations in the mining and metallurgical industries." (CASE B's Annual report, 2007: 5)

> "CASE D continued to acquire small elevator service companies to increase its service density." (CASE D's Annual report, 2007: 18)

> "Well recognized local or regional brands, with large installed base, remain the primary target for CASE C's acquisition policy." (CASE C's Annual report 2006: 11)

> "When we acquire companies, it might be for various different reasons. One reason might sometimes be that we just want to get more net sales, so we are not getting any new types of products, in that we just get more customers. Another reason might be that we get a better share of wallet from the existing customers, so to speak. However, more often it's that we want some new competences, or we might even want some new products from those… Often, there might be good reasons that it's just quicker to get it that way, and if there is some key competence, it might be actually a very long-standing effort to try to build that organically…" (Director, CASE A)

To increase our understanding on the role of identity, power and competence in the case companies' repositioning, the focus of the cross-case analysis is on how the interplay between identity, power, and competence development explains the transformation in the organizational boundaries when moving within the value system for customer solutions.

Reconfiguring corporate identity as a solution provider

Organizational identity answers questions such as who we are as an organization. Whereas challenging the existing business logic, mind-set, and corporate identity, the service transition has involved a change in companies' identity along with reconsidering the scope of vertical positioning. The interviewees used many ways to describe the corporate identity change from product and technology organization to provider of customer solutions. Commonly, the interviewee's conclude that the change has been intense, and it has influenced offerings, processes, structures and organizational culture to find a balance between efficiency-centered manufacturing values and service-oriented values, which are based on customization and flexibility (Gebauer, Fleisch, & Friedli, 2005). Interviewees describe the corporate identity change from products to customer solution as such:

> "To really get the message through the organization and get everybody to become customer-focused, creative, innovative rather than only technically focused, and still to be able to develop continuously that to some profitable business." (VP service unit, CASE A)

> "…it's a fundamental changing really only thinking about the technology, only thinking about the hardcore equipment to start thinking of all the services related to that, and also to think about the customer from a different perspective and angle as well." (Head of Services, CASE B)

> "Services used to be mandatory, something that allowed us to sell hardware and products. We had to provide services to keep the product on track. This was the situation 15-20 years ago. Today, the role of services is emphasized and people understand the importance of life-cycle costs and how important services are for product sales. Today, service business is our key business." (Area manager, CASE D)

> "Content of the contract [in smart solutions] will become more strategic for the customer and you will not be competing with pure maintenance firms anymore. You're not on the same lap with them anymore and you'll at the same level with Ferrari. Both you and the customer know that you're not competing with the masses but differentiation really occurs. We can really be distinctive with our services." (Head of Business Development, CASE C)

> "Based on my experience, you can't do this [smart solutions] if your top management is not committed to this. Basically everything changes; business model, workings and global processes. We move from greasing to data management to optimize life-cycle costs. This is extremely difficult already and this wouldn't be possible without the support from the top management. (Head of Business Development, CASE C)

In addition, the shift in corporate identity has been institutionalized to an extent, as examples can be found, in addition to our interviewees, from annual reports and official documents too.

> "One of the focus areas for 2011 has been defined as the strengthening and unification of CASE B's identity. After several changes and acquisitions, there is a need to focus on common goals, operating methods, and practices based on the company's values and principles. The strengthening of a common identity and smooth cooperation throughout CASE B supports the company's goals: growth, profitability, and a strong balance sheet." (CASE B's Annual Report, 2010: 50)

> "A brand is so much more than just a logo, or a visual identity. It is a combination of a company's reputation and identity. Our reputation comes from making promises and keeping them. We optimize lifecycle value through efficient, flexible and environmentally sound power solutions on land and at sea. CASE A's roots are in engines and engineering, ships and power plants. We are passionate about technology and willing to go to great lengths to ensure that our solutions work as they should. We focus on maximizing customer

> benefits of our products and services through environmentally and economically sustainable measures. At the core of our brand personality is a great passion for what we do – for finding the best solutions for our customers' needs." (CASE A's website)

> "CASE C moved from selling products to selling solutions some time ago. We're now taking this process one step further and selling smart solutions that include software and automation to give customers the highest lifecycle value." (CASE C's Annual report 2009: 27)

> "We have evolved from a traditional engineering company into a high-tech company with know-how-driven operations." (CASE C's Annual report 2003: 3)

Defined as the "general expression of the overall purpose of the organisation, which, ideally, is aligned with the values and expectations of major stakeholders and concerned with the scope and boundaries of the organisation" (Johnson, Scholes, & Whittington, 2008:10), a company's mission constitutes an important part of the core organizational ideology (Collins & Porras 1996). Far from a fully exact image, the corporate identity attached to an organization by its corporate leaders can be imperfectly projected into objective public documents and statements of mission (Rodrigues & Child, 2008). Examining how their missions have evolved can be an imperfect, but still suitable illustration on the evolution of the companies' identities (Table 2).

While altering the organization's corporate identity through a new mission and vision is an important tool (Gioia & Thomas 1996; Clark et al. 2010), the articulation of the vision by leaders was identified as a fundamental step in the identity formation process (Gioia et al. 2010). According to Rodrigues and Child (2008: 890), "top managers may try to foster an organizational culture that lends credibility to their desired corporate identity".

> "And that's why I like the yesterday's statement very much from the CEO about entrepreneurship. You need to go back a little bit to the entrepreneurship. You need to look upon what the customer really need and you need to have an organization which is flexible and entrepreneurial enough to be able to put that package and the solution together" (Director, CASE A)

> "So in all communication and all marketing really, that stuff, it's there and visual, the top management has done well, they have highlighted how important the services are, quite thoroughly and consistently for several different years, so people have started to understand that it brings value to the company" (Head of Services, CASE B)

> "Top manager's job is to think how to make product desirable, how it solves customers' problems and how it will be presented to customer the way that it's interesting and easy to understand. Top managers need to show example and infect personnel around them with enthusiasm towards marketing and sales." (CEO, CASE C)

> "Troops need to be leaded from the front-line. Top managers need to be in the field, not in the headquarter reading the reports." (CEO, CASE C)

Table 2 The evolution of companies' mission during the service transition

Case	Mission/Vision/Strategy intent		
CASE A	2000-2002 "We contribute to solving the global needs of sea transportation and power generation by developing **equipment and services** that convert fossil fuel into power efficiently and with the lowest possible environmental impact."	2003-2004 "We **supply solutions** that meet the need of our sea transportation and decentralized power generation customers worldwide to convert fuels into power efficiently, reliably and with the lowest possible environmental impact."	2005-2014 "We **provide lifecycle power solutions** to **enhance the business of our customers**, whilst creating better technologies that benefit both the customer and the environment."
CASE B	2007-2014 "…to be the leading provider of sustainable minerals and metals **processing solutions**, and to become an innovative provider of sustainable energy and water processing solutions."		
CASE C	2003-2005 "CASE C enables businesses to become more productive by providing state-of-the-art lifting solutions and related maintenance services that maximize uptime and offer the lowest cost of ownership." "CASE C is the leading provider of high performing, reliable, and safe **lifting solutions with world-class maintenance back-up**." .	2006-2010 "We are not just lifting things, but entire businesses." "We want to be the undisputed leader of the lifting industry, and a benchmark for business performance and customer service."	2011-2014 "Not just lifting things, but entire businesses." "We know in real time how millions of lifting devices and machine tools perform. We use this knowledge around the clock to make our **customers' operations safer and more productive**."
CASE D	2006-2007 "Heart of your building"	2008 "Dedicated to people flow"	2012-2013 "CASE D's vision is to create the best people flow experience. Our strategy is to deliver **a performance edge for our customers by offering innovative, cost-competitive and eco-efficient solutions** that move people with ease, safety, and comfort. We want to make urban areas better places to live, act responsibly in everything we do, and create value for all our stakeholders"

SOURCE: Own elaboration based on companies' Annual Reports.

Modifying the corporate identity does not imply an instantaneous change in organizational identity and culture. This change has not been easy in anyway and it has not been finalized after many years of transition. While hiring new people with different attitudes and mindset was used "as boundary-mechanisms to reshape identity" (Santos & Eisenhardt 2005: 503), the identity change has also increased the need to acquiring new capabilities and knowledge (Nag et al. 2007) and controlling the industry bottlenecks (Jacobides 2011) to create and implement innovative solutions while assuring system reliability and the profitability (Salonen et al. 2006) and guaranteeing the lifecycle performance.

Developing new capabilities for going downstream

Shifting toward a customer-centric organization has increased the need for developing new knowledge and capabilities to deliver novel solutions for different customer segments (Brady et al. 2005; Penttinen & Palmer 2007; Ceci & Masini 2011). Particularly, case firms obtained new downstream resources and capabilities through acquisitions:

> "Several acquisitions during the year have broadened the skill base and enabled the entry into new types of services." (CASE A's Annual report, 2009:14)

> "…we made a lot of 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 service-mind-set in the company." (Head of Services, CASE B)

> "…with every acquisition comes a piece of unique knowledge. Even more important, through our maintenance activities we get a lot of input information for our R&D." (CASE C's Annual report, 2001: 6)

Thus, companies considered services and customer solutions as a potential source of competitive advantage that would require some reconfiguration of resources and processes to actualize. Respondents highlighted the importance of developing capabilities to effectively bundle products and services into (integrated) solutions:

> "You won't be successful at selling pure technology, because everybody can do it, probably even cheaper than you can do it. So technology itself cannot be your competitive advantage. The competitive advantage emerges from your ability to transform technology into services" (Product manager, CASE C)

> "[Acquired firm's] product portfolio is fully complementary with us. This [acquisition] enables us to position ourselves as a complete solution provider in harbors, intermodal terminals and in the shipping industry. We will now cover the entire logistics chain." (President, CASE C)

Transformation from products to services and customer solutions interacts with strategic capabilities by providing opportunities to acquire and develop new resources for new capabilities and on the other hand setting expectations about capability development to co-create and capture the value from services and solutions. Interviewees highlight several capabilities central for integrated solutions, such solution sales and value quantification capabilities:

> "When we start to provide total solutions to our customers, we need to understand their business environment extremely well. When we go to talk to our customers and provide for example outsourcing services, we need to hold a lot of competencies even before we are even starting to negotiate with them." (Manager, CASE C)

> "One of our strategic development programs is to develop sales competencies. Selling solutions, selling value and quantifying the delivered value during the sales process are our focus areas." (Area manager, CASE D)

Besides selling capabilities, all of the studied corporations also invested in developing software capabilities, which are mainly related to remote services and automation. Moving from manufacturing-based to software-based business model requires new type of resources, capabilities and investments as stated by the respondents:

> "… if I look at the bigger attempt that we made [in terms of acquisitions], sometimes, it might be something more than just physical products or conventional industrial services. It might be things like software, for instance. Now that these optimizers and condition-based monitoring are so important for us, of course we might even need some software products or some kind of, let's say software as a service capability, or you name it." (Director 2, CASE A)

> "The CASE C automation and software development unit was founded to better utilize the scale of CASE C's business and further develop software products for all business lines." (CASE C's Annual report 2010: 5)

Interviewees highlighted the importance of building a global network to achieve the required field service capacity and capabilities for delivering customer solutions. Moving downstream requires developing competencies related to network management and procurement as stated by the respondents:

> "…we have more than 180 different locations, so it really means that CASE A is really local and is fully owned by CASE A, so they are not agents or dealers, they are our own people, and there are more than 10,000 people in Services, so that's maybe the biggest difference. Our competitors, they don't really have this wide global network of their own people's companies. That's probably our biggest competitive edge." (VP, CASE A)

Shifting position to increase bargaining power

Re-positioning can be analyzed by examining different mechanisms developed during the establishment of the customer solutions strategy. Based on the acquisitions and investments, case companies have been moving towards downstream to win bargaining power vis-à-vis intermediate and end customers, but also to control compatibility and technical aspects in the systems included in their solutions, which is a necessary condition to warranty a performance threshold.

> “Acquiring, integrating, and developing automation companies has been a step in CASE A’s strategy to become a total solutions provider as services broaden the scope of supply to customers and CASE A gains better control of its value chain from design to lifecycle support.” (CASE A's Annual Report, 2007:13)

Customer solutions typically requires simultaneously addressing specific customer preferences and required technical features, which are two critical dimension for explaining manufacturers’ need to control how components and subsystems are coupled when moving toward complex customer solutions (Baines et al. 2011). Thus, because solution suppliers must guarantee system compatibility based on certain specifications to offer a threshold level of performance and customized services (Davies 2004), the service transition calls for specific governance structure to coordinate activities within the value system (Osegowitsch & Madhok 2003).

> “If you are an integrator you get a standard product of the propeller, you get a standard product of an engine, and you have to put them together not matching the performance, it means it’s a disaster, it can be sometimes, and still you have two different suppliers and you have to match them together meaning there is a lot of work with drawings and this and that… Of course we can promise better warranty terms because we have the control of the whole thing...” (General Manager, CASE A)

> “When you provide that type of performance agreement, you necessarily need to have control in a sense on everything from the ship design to the equipment that is there and to make sure that his has been built in the proper way.” (Director, CASE A)

> “Service business enables us to manage and control the product and customer thorough the product life-cycle. This enables us to know how our products function during the life-cycle and what is requires at different stages. In addition, this enables us to understand our customers’ requirements and needs better. I think that is the benefit of services.” (Area manager, CASE D)

While in the past they operate as subsystem providers, the case companies have found difficult to access to the end users because of the existence of third parties that controlled the access to end customers. For the case companies, their current customer’s blocking them to sell integrated solutions to customer’s customers presented a significant challenge. When product systems are sold to intermediate customers, service agreements should be separately sold to the system end users. Thus, from the case companies we found a challenge related to positioning. In order to overcome industry bottle necks and sell product and services simultaneously, case companies had to change their position to downstream closer to end-customers. As suggested by Pil and Holweg (2006), the analyzed companies tried to find permeable penetration points within the value system to influence end-users’ demands. This was validated by the interviewees’ and multiple strategic actions, such corporate acquisitions, and new alliances. Interviewee’s formulated implementation of re-positioning as such:

> “…we are selling to engineering companies, and the engineering companies are selling to the end-customer. And the engineering companies, they are not interested in buying services from us. So how are we able to connect with the end-customer and at the same time selling

> products to the engineering company? This is the way we are moving, to take the EPC and EPCM-role, so we wouldn't need engineering companies, but maybe we would use them as subcontractor, not vice versa. But in order to do that you need to take a lot of more risk" (Head of services, CASE B)

> "When the ship yard is coming with an inquiry to us then the dialogue has been going on for some time already. The concepts are more or less ready and it's difficult to influence. You can somewhat, but then five, six years ago we thought, how can we change this, and we saw that ship designers, they have always in early because that's before you go to the yard you need to have a design of what kind of ship. That's why we acquired actually several ship design companies then back… so we have today 400 people roughly working on ship designs. These people are involved with ships owners in really early phase, developing…" (VP, CASE A)

> "CASE D's key customers are builders, building owners, facility managers, and developers. In addition, architects, authorities, and consultants are key parties in the decision-making process regarding elevators and escalators." (CASE D's social responsibility report 2010: 2)

CONCLUSIONS AND IMPLICATIONS

Addressing the question of strategic re-positioning and firm boundaries in service transition, the present study was set out to study four leading manufacturing companies. The contribution of this study is three-fold: The study 1) highlights different drivers for re-positioning towards the downstream when servitizing a manufacturing company; 2) provides necessary understanding about the mechanisms that take place when changing the organizational boundaries, which were explored by application of three firm-boundary theories (identity, power, and resource-based view); 3) underlines the interplay of different firm boundary theories when implementing the service transition.

Theoretical Implications

Regarding the first theoretical contribution, the empirical study utilized case evidence from four leading international servitized manufacturers to provide evidence on the re-positioning needed when servitizing. Re-positioning is required to bundle products and services, and provide integrated solutions for the customers. In cases where a third party is located between the system integrator and the end-user, some of the system integrators seem to go downstream within the value system to establish a position as a solution provider. Where this transition involves a clear corporate identity re-definition, it also requires the systematic development of new resources and capabilities.

Secondly, the present study highlights the mechanisms utilized to servitize the manufacturing company for improved market power, broader scope of offerings, new resources and capabilities. Whereas the upstream moves were mostly based on collaborative practices, the chosen mechanisms for downstream moves were investments and acquisitions, which added new competences, reduced external dependencies, allowed for the control of core resources and key linkages in the value system, and minimize risk at the time of lifecycle service provision. In search of competitive advantage in times of diminishing product returns, manufacturing companies implement integrated solutions-based strategies based on the strategic thinking, that firm's bargaining power within the value system can be increased by broadening the scope of offerings towards integrated solutions and by moving downstream to offer integrated solutions, instead of separately selling add-on services for the customer after first delivering the product-system to solution provider.

The shift in company strategy from being a system integrator towards providing integrated solutions is vast and requires a significant change in strategy and organizational identity. Organizational identity corresponds to the question that "who we are as an organization". In this study, four cases were examined with regards their organizational identity. We found that the identity of an integrated solution provider represents significant change to that of a system integrator. Where the system integrators may hold an engineering or product-focused strategic identity, solution provider identity echoes the mindset focused on value-based, customer oriented thinking, where the customer is set on the center, value is intended to be quantified before the customer's buying decision, and the provider emphasizes the total cost of ownership for the customer. The mindset of a solution provider separated significantly to that of a product manufacturing firm.

Going downstream to provide integrated solutions calls for new resources, processes and capabilities, as highlighted by the studied cases. In particular, the cases underlined the need for global service network, product service bundling across organizational functions, solution sales process, service-related technologies, and a manufacturing capacity as well as supply chain that enables mass-customization of integrated solutions. Need for reconfiguration of resources, processes and capabilities, when moving towards downstream appears evident, when examining the comparative case data of this study. It seems that service transformation rather explains the search for new capabilities than other way around. Yet, obviously, the strategic belief to the company's dynamic capability to adjust strategic capabilities to fit with the integrated solutions strategy is one of the core antecedents for the service transition.

As the third theoretical contribution, the present study highlights the interplay and complementary explanatory power of the different theoretical approaches. Where the search for bargaining power seem to have the highest impact on the transition decision, company management's belief to dynamic capabilities of the firm to alter its strategy and develop new capabilities seem to be very important, whereas the organizational identity echoes the actual strategic change taking place during the transition. In different terms, where the search for power and competitive advantage explains the strategic decision, change in organizational identity is reflected in cultural artefacts and symbols that represent the new strategy, whereas the development of new capabilities is required to implement the strategy. These approaches can be seen as sequentially explaining the process of servitization, and re-positioning. The approaches and the explanations they provide are complementary, and hence particularly valuable when combined together.

Managerial Implications

This study emphasizes the role of firm boundaries when implementing service transition. The issue of firm boundary re-definition is important when planning and implementing servitization, and, hence, should not be neglected, not by the scholars nor managers focusing on servitization. For companies preparing for service transition, the study provides important tools for planning the implementation. Power, organizational identity, and capabilities provide important concepts to consider and to overcome the challenges of the organizational change. For already servitized solution providers, this study presents a framework to analyze the challenges faced to find potential structures that need development.

Building on the three approaches toward organizational boundaries, certain managerial guidelines can be recognized. Firstly, to leverage the new value system position when selling integrated solutions, customer value resulting for buying an integrated solution instead of products with add-on services needs to be quantified, to convince customer for the benefits. Secondly, to create an organizational identity that fits with the integrated solutions strategy, the new strategy has to be clearly defined. For this purpose, perhaps an own division for integrated solutions should be developed, to create an organizational identity that separates from product, engineering and add-on service identities. Clear identity should be created with supporting management systems and organizational structures. Thirdly, capability development is at the center when implementing the change. Firms have to address the development needs with regards to global service network, product service bundling across organizational functions, solution sales process, service-related technologies, and a manufacturing capacity as well as supply chain that enables mass-customization of integrated solutions.

Limitations and suggestions for further research

In this section, some limitations of this study are discussed and some suggestions for future research are presented. Despite the fact that this empirical study is based on comparing some leading cases, and far-reaching generalizations cannot be done, the present study provides valuable insight towards re-definition of firm-boundaries, when servitizing a manufacturing company. The interplay between different firm-boundary theories can provide interesting opportunities for future research, as firm boundary theories haven’t been utilized for studying servitized manufacturing firms. Moreover, as the present study utilized three firm-boundary theories, to discuss their complementary effects, and thus, cannot go in-debt in utilization of any single theory, further research utilizing any single theory is needed. In particular, further empirical research is needed from the positioning and organizational identity perspectives. Although the existing research on the role of capabilities in servitized manufacturing companies may be more saturated, further empirical research could shed light on important topics, such as the practices of resource reconfiguration in servitization. Moreover, future research could provide analysis on competitive dynamics in solutions provision. Finally, studies could look into the role and nature of strategic decisions, when deciding on the servitization strategy. Further research is needed on the effectiveness of strategic decision making, utilization and implementation of strategic knowledge.

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