Solution providers' strategic capabilities

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Abstract

Purpose – Drawing on the resource-based view of the firm, this study analyzes solution providers' strategic capabilities that facilitate above-average returns.

Design/methodology/approach – The study applies a qualitative comparative case method. In addition to an extensive set of secondary data, the results are based on interviews with 35 executives from nine leading industrial solution providers, their strategic customers, and suppliers. The analyzed solution providers were identified based on quantitative survey data.

Findings – By observing six distinctive resources and three strategic business processes, the present study identifies seven strategic capabilities that occur in different phases of solution development and deployment: 1) fleet management capability, 2) technology-development capability, 3) M&A (mergers and acquisitions) capability, 4) value quantifying capability, 5) project management capability, 6) supplier network management capability and 7) value co-creation capability.

Research limitations/implications – The study develops a generic model for the strategic capabilities of servitization. Application of the developed model to different contexts would further validate and enhance it.

Practical implications – Managers can use the developed model to benchmark, identify, build, and manage solution providers' strategic capabilities and associated practices.

Originality/value – The study develops a valuable conceptual model based on the comparative case data. Case firms were selected for the study based on a representative quantitative dataset. The results were verified and triangulated with external data.

Keywords: Solution business, solutions, strategic capability, resource-based view, servitization

1. Introduction

Product manufacturers are transforming themselves into solution providers to attain sustainable competitive advantage (Kindström, Kowalkowski and Nordin, 2012; Kucza and Gebauer, 2011; Story, Raddats, Burton, Zolkiewski and Baines, 2016; Windahl, 2015) by sensing and seizing business opportunities in their customers' value chains (Kucza and Gebauer, 2011; Wise and Baumgartner, 1999). The business model change from standardized products to solutions or advanced services has been labeled *servitization* (Baines and Lightfoot, 2013; Vandermerwe and Rada, 1988), *moving from products to services* (Oliva and Kallenberg, 2003), *going downstream* (Wise and Baumgartner, 1999), *tertiarisation* (Léo and Philippe, 2001), and *service infusion* (Kowalkowski *et al.,* 2012). The extant literature has described solutions as a set of products, services, and software (Nordin and Kowalkowski, 2010) that require relational processes and collaborative learning among solution providers and their customers and suppliers (Barry and Terry, 2008; Jean, Chiou and Sinkovics, 2016; Tuli, Kohli and Bharadwaj, 2007). Despite the encouraging examples of successful industrial solution providers such as Ericsson or Wärtsilä, prior studies have reported that perhaps only 20% of manufacturers succeed in implementing their strategies to develop, sell and deliver solutions (Reinartz and Ulaga, 2008; Ulaga and Reinartz, 2011). Studies have reported that manufacturers fail to develop capabilities either to assess the markets, differentiate, scale, or price their solutions (Gebauer, Saul, Haldimann and Gustafsson, 2017; Indounas, 2015; Shankar, Berry and Dotzel, 2009). Consequently, it becomes increasingly important to identify, analyze, and develop those strategic capabilities that enable manufacturers to create economic rents by providing solutions.

The extant literature provides evidence of manufacturers' solution business strategies (Gebauer, Fleisch and Friedli, 2005; Raddats, 2011; Wise and Baumgartner, 1999), operational capabilities (Storbacka, 2011; Windahl and Lakemond, 2006), dynamic capabilities (Huikkola, Kohtamäki and Rabetino, 2016;

Kindström, Kowalkowski and Sandberg, 2013), and business models (Kujala *et al.* 2010; Storbacka, Windahl, Nenonen and Salonen, 2013; Visnjic Kastalli and van Looy, 2013) in a context of solution offerings. Studies have identified the core capabilities of pure service firms (Aung and Heeler, 2001), the capabilities required for new solutions development (Kindström *et al.* 2013; Kindström and Kowalkowski, 2014) and the capabilities underlying manufacturers' solution units (Bustinza, Bigdeli, Baines and Elliot, 2015; Davies, Brady and Hobday, 2006; Eloranta and Turunen, 2015; Oliva and Kallenberg, 2003). Despite the recognized importance of this topic (Ostrom *et al.,* 2010; Paiola, Saccani, Perona and Gebauer, 2013; Story *et al.,* 2016), and acknowledging a few exceptions (see Ceci and Masini, 2011; Raddats and Burton, 2014; Storbacka, 2011), the existing studies do not address solution providers' organization-wide strategic capabilities that are centrally related to the provision of solutions or product-service systems (PSS); that is, the integration of products, services, and software. Furthermore, even though an inter-organizational network has been seen as a central resource in the previous resource-based literature (Dyer and Singh, 1998; Gebauer, Paiola and Saccani, 2013; Teece, 1986), prior research on solutions capabilities has lacked a relational and network perspective (Kohtamäki *et al.*, 2013). Moreover, many of the existing studies, despite the centrality of case selection, rarely use a systematic selection process but instead select cases based on convenience, resulting in somewhat biased results (Beverland and Lindgreen, 2010). Studies often apply data only from the focal company calling for a customer perspective to triangulate the data and verify the conclusions (Ostrom *et al.*, 2015; Ulaga and Reinartz, 2011; Windahl, 2015). In sum, the existing literature lacks any in-depth analysis of the strategic capabilities of the systematically selected leading solution providers.

The present study intends to fill this gap by building on the grounds of the resource-based view and solution business literature. The purpose of the paper is to identify those strategic capabilities that enable solution providers to outperform their rivals in the industrial markets. The paper answers the research question: *what determines the solution provider's strategic capabilities*. The findings contribute to the

literature on the solution business and PSS by utilizing the identified resources and strategic business processes to understand how manufacturers combine to form strategic capabilities of solution provision. The present study utilized representative quantitative data to select nine extreme manufacturing cases where 35 interviews with senior managers were conducted to complement an analysis of extensive secondary data.

2. Theoretical background

2.1. Resource-based view of the firm (RBV)

The RBV suggests that a firm's sustainable competitive advantage is based on its valuable, scarce, and inimitable set of resources and capabilities (Barney, 1991; Grant, 1991). Resources are productive assets the firm possesses or controls whereas capabilities are described as something that the firm can do to deliver value (Day, 1994). This inside-out view of strategy proposes that a firm's resources must be deployed effectively—through strategic business processes, routines, managerial systems, and organizational procedures, rules, and norms—to create exceptional value for the firm's key stakeholders (Ray, Barney and Muhanna, 2004; Long and Vickers-Koch, 1995; Wright, Dunford and Snell, 2001). Prior literature has defined resources, processes, and capabilities as hierarchically-categorized concepts (Kraaijenbrink, Spend and Groen, 2010). Pure resources and assets have been defined as zero-level capabilities or threshold capabilities that allow firms to stay in the market in the short term. Strategic capabilities (Winter, 2003), on the other hand, consist of first-order elements of deploying capabilities, and "are the most critical and distinctive resources a company possesses" (Long and Vickers-Koch, 1995: 13). In sum, strategic capabilities emerge from the company's effective use of its distinctive resources that are highly valuable to the firm's key stakeholders.

2.2. Capabilities in the solution business

The extant literature has defined solutions in a variety of ways (Nordin and Kowalkoski, 2010), including as *integrated solutions* (e.g., Davies, Brady and Hobday, 2006), *customer solutions* (e.g., Tuli *et al*., 2007), *total solutions* (Matthyssens and Vandenbempt, 1998), *product-service systems* (PSS) (Baines *et al.,* 2008; Tukker, 2004), *complex product systems* (CoPS) (Davies and Brady, 2000; Kohtamäki and Partanen, 2016) or *hybrid offerings* (Ulaga and Reinartz, 2011). Solutions have typically been defined as a bundle of products, services, and software (Vandermerwe and Rada, 1988) that can resolve customer-specific problems (Miller *et al.,* 2002; Tuli *et al.*, 2007) and increase the total value to the customer during the product life-cycle (Wise and Baumgartner, 1999). The extant studies suggest that the solutions enable manufacturers to strategically differentiate themselves from their competitors (Kindström *et al.*, 2012; Raddats, 2011), acquire a more stable source of revenues (Sawhney Balasubramanian, S. and Krishnan, 2004) and increase customer loyalty and profits (Tuli *et al.*, 2007). Moreover, Fang, Palmatier and Steenkamp (2008) (see also Kohtamäki *et al.*, 2013) have highlighted the non-linearity between the provision of solutions and firm performance, suggesting the necessity of building a critical mass of solutions to make a positive performance impact. Existing research also underlines the importance of standardizing solutions to create cost advantages (Böttcher and Klingner, 2011; Davies and Brady, 2000; Matthyssens and Vandenbempt, 1998), helping firms avoid losing strategic focus by cautioning them against creating too much variety (Ceci and Masini, 2011; Fang, *et al.*, 2008). Thus, the transition from products to solutions requires careful balancing (Ceci and Masini 2011; Matthyssens, Vandenbempt and Goubau, 2008; Miller *et al*., 2002).

Studies provide evidence of the importance of legitimating solutions by organizing them under profit-and-loss-responsible business units to facilitate organizational renewal (Oliva and Kallenberg, 2003), but also paradoxically highlight the importance of product-service bundling and broader system-integrator capabilities (Davies, Brady, and Hobday, 2007; Storbacka, 2011; Story *et al*., 2016; Paiola *et al.,* 2013). Transforming a manufacturer into a provider of solutions is particularly difficult because of the influence

of path dependency—a factor highlighted by the RBV. Path dependency refers to firms' past decisions, strategies, structures, and cultures that affect future actions, suggesting that a prior history of operating as a product-manufacturing company may hinder the firm's capability to add, sell, and deliver solutions (Neto, Pereira and Borchardt, 2015). In other words, a manufacturer may be trapped by its manufacturing history (Huikkola, Ylimäki and Kohtamäki, 2013). Thus, when expanding the company orientation from products to solutions, a manufacturing firm first needs to unlearn the lessons learned from its history as a dedicated manufacturer, so as to learn how to sell and deliver products, software, and services as solutions (Gebauer and Friedli, 2005; Huikkola, Kohtamäki and Rabetino 2016; Kindström, Kowalkowski and Sandberg, 2013). Hence, firms must create a new resource/capability base while continuing to leverage existing resources—in other words, to explore solutions provision while exploiting product-related capabilities (Birkinshaw and Gibson, 2004). The present study adopts the viewpoint that solutions are combinations of products, services, and software, which require relational processes across the organization and its boundaries to develop, sell, and deliver them successfully. The study intends to study the solution provider's capabilities suggesting that the advantage is embedded in its ability to integrate the benefits of these logics by balancing and stretching development of products, software, and services into solutions.

Table 1 presents the selected extant studies on the key capabilities in the solution business, their key contributions, and main limitations. Studies focusing on dynamic capabilities in the solution business have been excluded from the table.

Table 1. Studies reflecting solution provider's capabilities.

Author(s)	Data/methodology	Key findings/contribution	Main limitations
Ceci and Masini (2011)	Mixed method. Ten IT solutions firms operating in Italy were examined through an analysis of documentary and archival data and interviews with project managers, marketing directors, and sales directors	The provision of integrated solutions is generally a more valuable option that the sale of pure hardware or software. The literature review suggests that firms need seven key capabilities to provide customized solutions. These are 1) software development capabilities, 2) hardware and infrastructure manufacturing	The results are applicable to solution providers operating in IT sector. Capabilities required in different business models vary

		capabilities, 3) consulting capabilities, 4) financial capabilities, 5) delivery capabilities, 6) post-sales capabilities and 7) systems integration capabilities	
Davies and Brady (2000)	Case study including interviews from two companies: 1) Ericsson and 2) Cable & Wireless	Systems integration and project management are core capabilities when supplying solutions	Strategic, dynamic, and operational capabilities are intertwined. No customer/supplier interviews. Studied companies provide specific customized solutions
Davies, Brady and Hobday (2006)	The qualitative research involved in-depth collaboration with five international companies based in manufacturing and services. Detailed interviews included 100 CEOs, directors, senior project managers, heads of functional department and project managers	Study suggests three levels of building an organizational capability. At Level 1, the company must build a new face to the customer, at Level 2, it needs to strengthen its back-end capabilities and, at Level 3, the organization — front and back — must be refocused around customers' needs and around repeatable, customized solutions delivery	Paper focuses on specific customized solutions. Results are applicable mainly to MNE's
Hobday, Davies and Prencipe (2005)	The study compares evidence from two high-volume industries (automobiles and HDD)	Systems integrators of capital goods move downstream into service-intensive offerings while producers of high-volume components and consumer goods use systems integration capabilities (modern corporation's core capability) to exploit upstream relationships with input suppliers	The study focuses purely on one dedicated capability area: systems integration capability
Magnusson, Tell and Watson (2005)	Established and large engineering firms such as GE, Siemens, Alstom, and ABB, are the main subject of the analysis. These studies were based on a broad range of data sources and methods of analysis. Primary data (approx. 100 interviews between years 1994-2002) were collected from loosely structured interviews with representatives from equipment manufacturers, utilities, regulators, etc.	The results indicate that systems integration is a core capability for the supply of large power plants	The paper focuses on firm-level technology strategy rather than organization-wide strategic capabilities
Matthyssens, Vandenbempt and Weyns (2009)	Qualitative case study (systematic combining). 26 interviews + secondary data + 2 focus group meetings	A transition from basic offerings to value-added offerings requires a combination of building marketing competences and marketing of competences (real competence-based marketing)	No customer perspective used for triangulation
Miller *et al.* (2002)	Longitudinal study of 30 solutions organizations. Both primary and secondary data applied	Solution providers create a profitable solutions surplus by 1) exploiting distinctive capabilities to provide outcomes otherwise unavailable to a client. 2) They sustain that surplus by managing the tensions between client and capability requirements — balancing the two and, when possible, finding complementarity between them. Client centricity is embraced at little peril to capability creation. 3) They manage these tensions by employing a three-faceted organizational design comprising the following: comprehensive and empowered front-end units to represent client perspectives; responsive back-end units to exploit and develop capabilities; and strong leadership and infrastructure at the center to promote the constant collaboration required between front and back	Results are applicable mainly to MNE's

Paiola, Saccani, Perona and Gebauer (2013)	Qualitative research. 20 exploratory and 4 in-depth case studies. The empirical research was conducted between 2006 and 2010. The study included 23 executive interviews	The developed framework suggests four distinct strategic approaches relating the service components and the development of capabilities: 1) selling after-sales services, 2) integrating after-sales solutions, 3) selling life-cycle solutions and 4) orchestrating total solutions	No customer/supplier interviews conducted to validate the results. The results are applicable mainly to small-and-medium sized OEMs
Parida, Sjödin, Wincent and Kohtamäki (2014)	Mixed method. Quantitative study included 122 companies and 7 were eliminated from the analysis. Qualitative research included 30 interviews from 11 Finnish and Swedish manufacturing companies	Based on qualitative analysis, the researchers found four distinctive capabilities common to successful product-service providers: 1) business model design capability, 2) network management capability, 3) customized development capability and 4) service delivery network management capability	The qualitative analysis was conducted based on interviews collected from relatively large manufacturers, and thus, the results might not be applicable to SMEs
Raddats, and Burton (2014)	A multiple case research design including six UK-based manufacturers from three different industries. 12 interviews	Three capabilities were identified which distinguish multi-vendor solution providers from single-vendor solution providers given the complexity of multi-vendor solutions (expertise specifying the solution, engineers trained in implementing/supporting solution, partnerships with component suppliers of the solution). These capabilities are underpinned by both technical capability and impartiality in solution specification	The case firms were operating in three sectors: aerospace/defense, IT and Telecommunications. No information on company size was provided. No customer/supplier interviews were conducted to triangulate the results
Spring and Araujo (2013)	Qualitative single case study (project/product focus)	The article presents a model of service development in manufacturing firms, consisting of a network trigger, an opportunity to change the 'productive opportunity', the 'revelation' of resources and Penrose-services, a reconfiguration of the network, leading to an expanded productive opportunity and hence a platform for marketing new service capabilities	Case study focusing on one focal company does not provide generalizable results. No customer and supplier interviews conducted. Focus is on individual projects and products
Story, Raddats, Burton, Zolkiewski and Baines (2016)	Researchers conducted 24 interviews with senior executive from 19 UK-based manufacturers, intermediaries and customers across multiple sectors	The study identified six key business activities, within which advanced services capabilities were grouped. The unique and critical capabilities for advanced services for each actor were identified as follows: manufacturers; the need to balance product and service innovation, developing customer-focused through-life service methodologies and having distinct, yet synergistic product and service cultures; intermediaries, the coordination and integration of third party products/services; customers, co-creating innovation and having processes supporting service outsourcing	The study does not investigate relational capabilities in dyadic or network relationships
Storbacka (2011)	Qualitative study. 10 multinational firms, 5 industry expert interviews, 10 senior manager interviews + research workshops	The framework consists of a solution process with four phases (develop solutions, create demand, sell solution, and deliver solution) and three groups of cross-functionality issues (commercialization, industrialization, and solution platform). The framework identifies twelve capability categories, and 64 capabilities and management practices pertinent to the effective management of the solution business	Results not verified by customers. No systematic case selection applied. Extensive list of operational capabilities categorized

Tuli, Kohli and Bharadwaj (2007)	49 customer managers and 55 supplier managers + 21 managers in two focus groups interviewed	Vendors view a solution as a customized and customized combination of goods and services to meet a customer's business needs. In contrast, customers view a solution as a set of customer–supplier relational processes comprising 1) customer requirements definition, 2) customization and integration of goods and/or services and 3) their deployment, and 4) post-deployment customer support, all of which are aimed at meeting customers' business needs. The relational process view and social capital can help suppliers deliver more effective solutions at profitable prices	Focus is purely on dyadic supplier-customer relationships
Ulaga and Reinartz (2011)	Qualitative case study, 22 senior manager interviews	Successful vendors 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. These capabilities influence manufacturers' positional advantage in two directions: differentiation and cost leadership	Results not verified by customers (only vendor perspective). Strategic business processes not described. No network perspective (only intra-firm capabilities identified). Relatively large companies studied

Table 1 indicates that the prior studies have identified manufacturers as possessing solution delivery capabilities (Davies and Brady, 2000; Parida *et al.,* 2014), solution-selling capabilities (Reinartz and Ulaga, 2008; Storbacka, 2011), system-integrator capabilities (Ceci and Masini, 2011; Davies and Brady, 2000; Magnusson, Tell and Watson, 2005) and customer management capabilities (Miller *et al.,* 2002; Story *et al.,* 2016; Tuli *et al.,* 2007). Many studies have investigated only some particular capability blocks, thus neglecting other capabilities that may create wealth for the solution provider. Moreover, most of the studies do not discuss the enabling role of strategic business processes or key activities that form strategic capabilities. Hence, we concur with the advice of Rabetino, Kohtamäki and Gebauer (2016) "*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."* Table 1 also shows that the prior studies have not widely applied triangulation techniques to verify their results, the case selection process has been defective, the unit of analysis has typically been the focal company, project or business relationship, the sample has been skewed toward multinational enterprises, and the research context has been limited to reviewing companies operating in narrow business sectors.

3. Methodology and data

3.1. Data collection

The present study was implemented in the manufacturing sector in Finland. Finland has a small, highly industrialized, and open economy, in which the relative proportion of multinational manufacturers is higher than in other Scandinavian countries or in Austria, Germany, or Switzerland, which are well-known for their established and economically important engineering and manufacturing sectors and "mittelstands." KONE, Metso, Outotec, and Wärtsilä are a few examples of listed machinery manufacturers established in Finland that have succeeded within their industries by providing solutions to their customers. In addition to domestic manufacturers, large multinationals such as ABB, AGCO, and Sandvik have located their development functions in Finland. Therefore, considering the special characteristics of the Finnish manufacturing sector, the population of Finnish machinery manufacturers provides an interesting case setting in which to analyze firms that have outperformed their competitors by successfully developing, selling, and delivering solutions.

For this study, two different datasets were utilized. First, quantitative data were collected to select interesting cases systematically from representative quantitative data collected in Finland in 2010. Before the survey was sent to the targeted firms' representatives, both authors and one research assistant telephoned all 404 targeted firms' CEOs to identify the managers responsible for developing the manufacturers' solution business. The quantitative data were collected using a survey sent to all Finnish machinery manufacturers (SIC 28) employing 20 or more people. We received responses from 115 of the targeted 404 firms, corresponding to a response rate of 28.5%.

Second, we selected nine successful manufacturers to provide a qualitative dataset. These nine extreme cases were identified as candidates for in-depth qualitative analysis based on each firm's solution sales as a percentage of the firm's total revenue (see Fang *et al.*, 2008), long-term profitability (ROI% / EBITDA, see Homburg, Fassnacht and Günther, 2003) and global market position (numbers 1–3 in their industries; see Ulaga and Reinartz, 2011). These selection criteria were applied because of the need to conduct an in-depth study of leading manufacturers that were evidently successful based on their provision of solutions, profitability, and market positions. The number of cases studied here aligns with Eisenhardt's (1989: 545) suggestion that **"***while there is no ideal number of cases, a number between 4, and 10 cases usually works well."*

All of the studied case firms are global industry leaders, and solutions accounted for 15–50 % of their total revenues (with a median value of 20.0 % and a mean value of 27.2 %). The sub-sectors where the studied firms operated were mature, consolidated, cyclical, and capital intensive, thus representing the characteristics of industries where solution-based strategies are typically adopted (Matthyssens and Vandenbempt, 2008). Table 2 describes the sample of the nine solution providers with pseudonyms.

Table 2. Sample description.

	Firm size	Solutions share of revenues	Core products	Core solutions and services
Lifting Equipment Plc (LEP)	7000 million € 43,000 employees	46 %	Lifting equipment	Spare parts, maintenance, modernization, full-service contracts, customer business analyses, remote services, project management
Lifting Machine Plc (LMP)	2100 million € 12,000 employees	40 %	Lifting equipment	Spare parts, maintenance, outsourcing, modernization, service contracts, remote services, operating services
Heavy Vehicle Plc (HVP)	350 million € 1,000 employees	20 %	Heavy vehicles	Spare parts, maintenance, service contracts, remote services for fleet management
Agro Plc (AP)	650 million € 2,300 employees	20 %	Heavy vehicles	Spare parts, maintenance, financial services

Armachinery Plc (ArP)	740 million € 3,600 employees	30 %	Military equipment	Full-service contracts, spare parts, maintenance, modernization
Foodline Plc (FP)	140 million € 300 employees	15 %	Production lines	Turnkey solutions, spare parts, maintenance, modernization
Logger Inc (LI)	30 million € 60 employees	15 %	Heavy vehicles	Spare parts, maintenance
Metal Works Inc. (MWI)	140 million € 1000 employees	35 %	Metal products	Turnkey solutions, engineering, welding solutions
Valves and Pumps Inc. (V&P)	35 million € 130 employees	20 %	Industrial valves and pumps	Spare parts, maintenance, customer process optimization

3.2. Description of data

The nine firms were selected to conduct an in-depth study of the solution providers' strategic capabilities. All of the interviewees held senior manager positions such as CEO, Chair of the Board, Service Director, Marketing/Sales Director, and (Global) Key Account Manager. Interviewees from the customer firms held positions such as CEO, Director of Real Estate and Procurement, and General Manager, and respondents from the strategic suppliers held positions such as CEO, Head of Business unit, and (Global) Key Account Manager. Each respondent had profit-and-loss responsibility and was responsible for developing a particular business unit or business relationship. The lead researcher conducted 35 semi-structured interviews between spring 2010 and autumn 2013. All the interviews were recorded with permission, and lasted between 45 and 200 minutes, and were transcribed verbatim shortly after they took place. The process produced 557 pages of transcribed text (single spaced text in a 12-point font). The interview topics were directly related to the studied firms' capabilities and sources of competitive advantage. The lead researcher controlled the discussions by steering conversations to the target topics when necessary and appropriate. Because each interviewee had a personal view on his or her firm's competitive advantage, the content of the interviews was interpretative in nature. Given these potential biases, the responses of the external interviewees (who were not focal companies' executives) were compared to those of the studied firm representatives to ensure the study's reliability and credibility (Bowman and Ambrosini, 1997). Additionally, extensive secondary data were analyzed to complement

the primary data and to address possible topics that were not discussed in the interviews. Table 3 represents the data utilized.

Table 3. Data description.

	Primary data	Secondary data
Data source	Focal companies' executives (e.g., CEO, chair of the board, service director, marketing director, sales director, director of new service and product development) interviews (19 interviewees/interviews)	Annual reports, 2000-2014 (3953 pages)
	Suppliers' executives (e.g., CEO, unit head, global key account manager, key account manager) interviews (8 interviewees/interviews)	Histories (3174 pages)
	Customers' executives (e.g., CEO, business owner, purchasing director) interviews (11 interviewees/8 interviews)	Press/stock exchange releases, 2000-2014 (996 documents)
		Business magazine stories, 2000-2014

3.3. Data analysis

The collected data were repeatedly compared with the literature on the solutions and firm resources and capabilities, thus we followed an abductive reasoning process (Nag, Corley and Gioia, 2007). The researchers used memoranda and notes to clarify and organize the data from different cases and sources, and engaged in several rounds of discussion to identify similarities and differences between the cases. The discussion stage was followed by data analysis, proceeding from the more concrete and unambiguous (resources) to the more abstract and ambiguous (capabilities) (Huberman and Miles, 1994). To analyze the data and to discern and organize substantive issues in terms of the firms' use of their resources, researchers undertook a within-case analysis of each firm to understand each firm's resource base as a stand-alone entity. Next, we looked for patterns through the application of a cross-case technique

(Huberman and Miles, 1994). The QSR NVivo program was used to code, list, and structure the themes found in the data.

When analyzing the data, we coded each interview based on the respondents' interpretations of the subject. These codes were compacted into first-order categories representing the language used by the respondents (Nag *et al.,* 2007). This first-order category emerges purely from the data, thus illustrating the interviewees' voices and perceptions of the topic. The next step concentrated on the analyses of the first-order items. This second-order label consists of theoretically distinctive items and the abstraction level is higher in the second-order category than in the first-order one. The data were analyzed through qualitative content analysis technique. This technique helps researchers to find similarities between the cases, helping them to convert empirical content into theoretical concepts (particularly to the categories of distinct resources and strategic business processes). The third and final step included the creation of the most abstract third-order label through an abductive reasoning process in the light of the resource-based view of the firm. Figure 1 depicts the study's coding and reasoning processes in outline. The left side shows the first-order items, that is, the terms and themes presented by the respondents (the themes on the left-hand side are not exhaustive but reflect the relevant themes regarding the capability block). These themes were further assembled into second-order theoretical categories. The right-hand side of the figure shows the overarching dimensions that emerged from the final cross-case analysis, presenting the seven strategic capabilities identified among the studied solution providers.

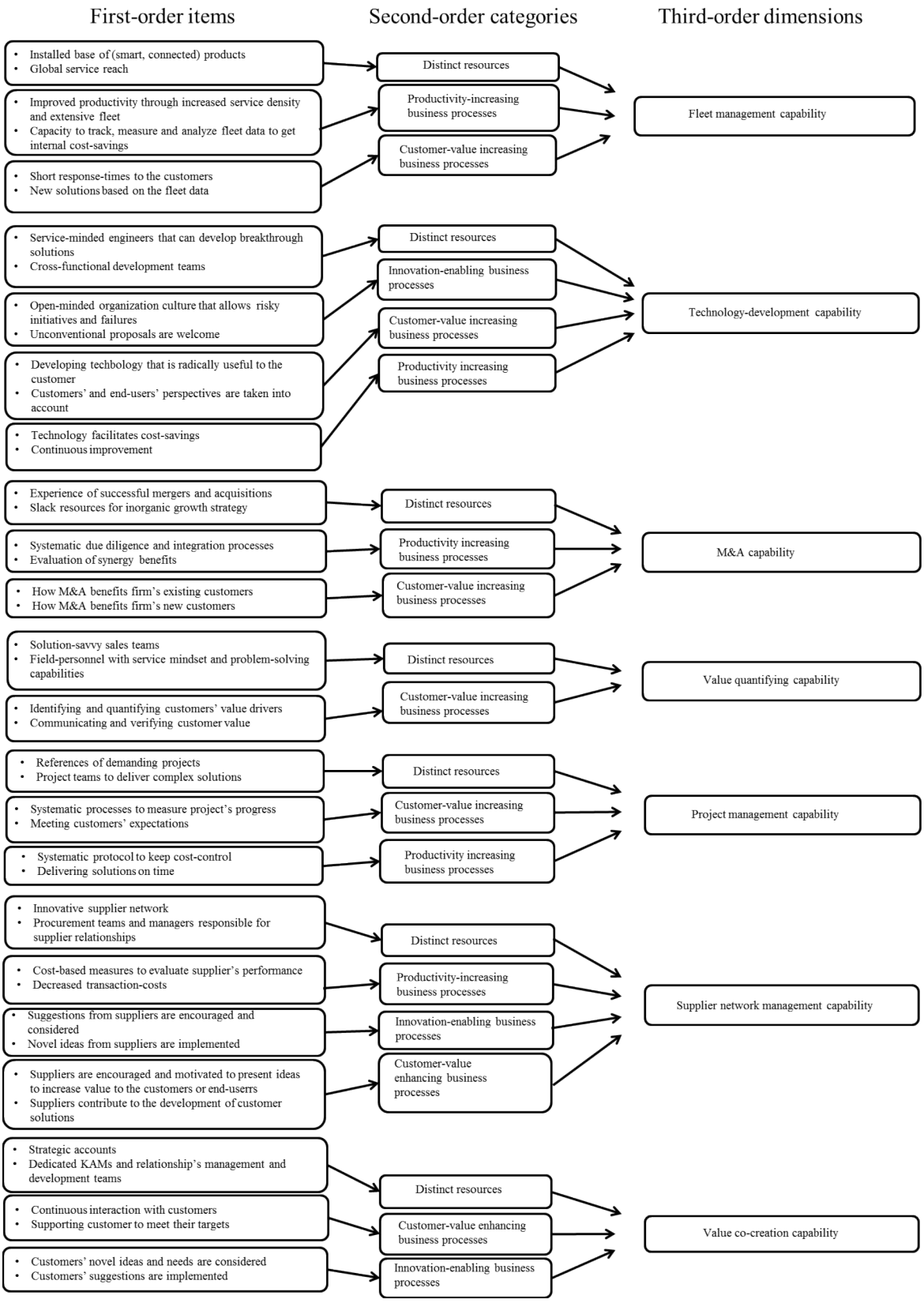

Figure 1. Study's coding and reasoning processes.

Using multiple sources of data confirmed that the investigated firms' representatives' responses were not biased and that multiple actors shared the same sentiments regarding the studied firms' most valuable, scarce, and inimitable capabilities (Bowman and Ambrosini, 1997). A pattern-matching logic was applied to verify the conclusions (Yin, 1994) and the cases were reviewed over a lengthy period spanning spring 2010 until the autumn of 2015, to examine the sources of sustainable competitive advantage. Furthermore, a data auditing technique was applied (Huberman and Miles, 1994), which involved one independent researcher (a PhD specializing in industrial services and strategic management) reading and verifying the conclusions.

4. Results

4.1. Solution providers' distinctive resources

Although single resources and processes rarely create a sustainable competitive advantage in technology companies, they need to be identified to create an optimal combination to create strategic capabilities and further, sustainable competitive advantage. We identified six categories of resources available to the solution providers: 1) the installed base of products and service contracts, 2) physical and technological assets, 3) intellectual capital, 4) human capital, 5) financial assets, and 6) external assets. Table 4 presents these resource categories and examples of distinctive resources in the context of solution provision.

Table 4. Solution providers' distinctive resources.

Resource category	Examples of distinctive resources
Installed base of products and service contracts	Manufacturer's own fleet Competitors' products 3rd party products Existing service contracts

Physical and technological assets	R&D facilities Service depots Manufacturing sites
Intellectual capital	Brand Reputation and customer references Fleet data Database of the customers and suppliers Patents
Human capital	Technicians and service workers R&D personnel and engineers Front-line personnel Solution sales teams
Financial assets	Cash (flow) (Negative) working capital Loans from the lenders
External assets	Customers' expertise of knowledge Suppliers' expertise of knowledge Universities' expertise of knowledge Intermediaries' expertise of knowledge Developers' expertise of knowledge

4.2. Solution providers' strategic business processes

A firm's management systems, structures and organizational culture facilitate (or hinder) the deployment of resources within the firm. In the case companies, three types of strategic business process that steered the exploitation of resources were identified: 1) productivity-increasing business processes, 2) customer-value-enhancing business processes and 3) innovation-enabling business processes. Table 5 illuminates how these strategic business processes occur in practice in the context of solution business development. The identified strategic business processes are generic, but the difference is in the firm's systematic application of them and how disciplined solution provider applies them in their daily business operations.

Table 5. Solution providers' strategic business processes and associated practices.

	Strategic business processes		
	Productivity-increasing business processes	*Customer-value enhancing business processes*	*Innovation-enabling business processes*

Example of practice(s)	Lean-method application; back-office industrialization; service modularity; standardization of procedures; dynamic dispatching	Customer's process optimization; provision of critical equipment data to the customers; identifying, quantifying, communicating and verifying business critical customer data	Breakthrough solutions development; free work time (e.g., 20%) allocation to alternative projects; investments in insecure initiatives (70/20/10 rule); continuous questioning; encouraging personnel to take risks; fast piloting; allowable to fail
Illustration of the dedicated strategic business process occurrence	"We have improved the productivity of our service business through an innovative map tool, which enables us to plan and show our maintenance routes. The tool enables us to achieve excellent response times with the shortest possible arrival times, and it reduces our costs…In addition, implementation of our modular maintenance method increases our customer satisfaction and our own productivity…Field personnel have been trained in the predictive maintenance technique, which ensures the quality, and uniformity of maintenance operations globally. Both new equipment and modernization installation procedures have been industrialized" (Annual report 2005/LEP)	"We can enhance our customers' production effectiveness by training them and producing data on production efficiency. For example, we can compare the productivity of different users and approach the customer if we consider there to be a need for personnel training etc. This is our aspiration: to maximize the capacity of the equipment and to guide and train the customer to achieve their production's full potential" (Service director/LMP)	"Some may say that our success is based on our technology, management team, or on the whole, good people. However, if I mention one thing, our success is based on the organization's embedded ability to question existing things. We have to question our decisions, and we have to want to change" (Chair of the Board/LEP)

Productivity-increasing and customer-value enhancing strategic business processes are *exploitative* by nature. They aim to improve a firm's performance in the short term. An innovation-enabling business process, on the other hand, is *explorative* by nature and is intended to improve a firm's performance in the long term. Managers of solution providers need to balance the application of these strategic business processes.

4.3. Solution providers' strategic capabilities

Strategic capability is an outcome of a firm's ability to combine its resources and strategic business processes in a unique and valuable manner. The empirical data gathered and the subsequent data analysis revealed seven strategic capabilities that determined the emergence of the solution providers' sources of competitive advantage. Figure 2 shows how the solution providers' strategic capabilities are materialized through the combination of solution providers' distinctive resources and strategic business processes.

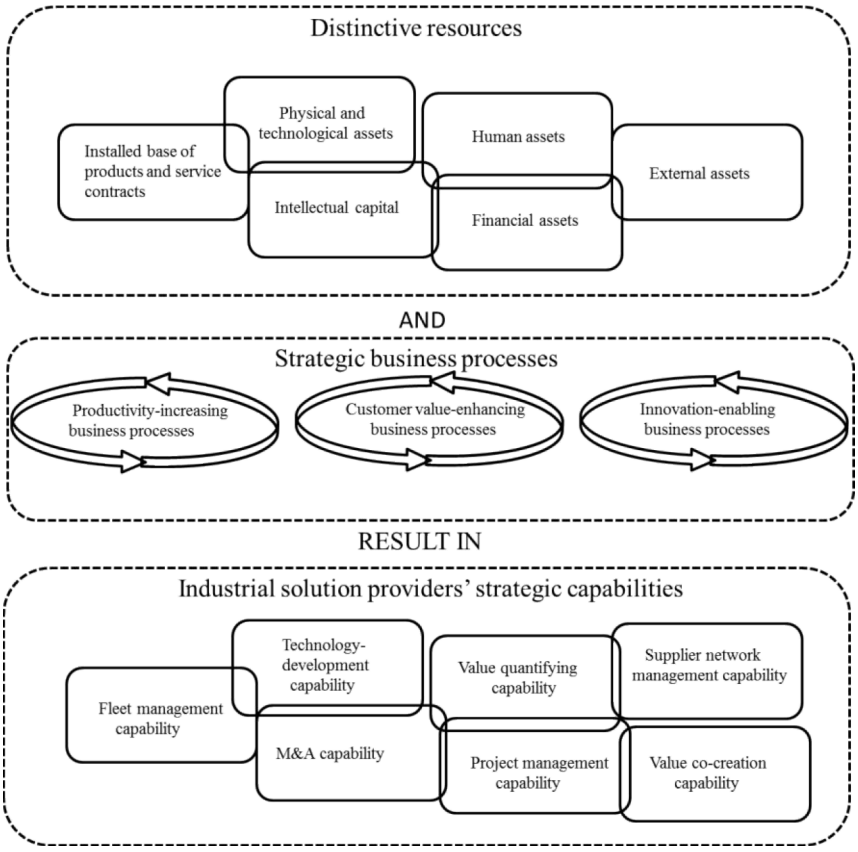

Figure 2. Materialization of solution providers' strategic capabilities.

A fleet management capability allows a solution provider to gather economic rents through an improved understanding of its customers' processes and product usage. The installed base of products, service contracts, service-related technology, and field personnel provide valuable data on the customer's key processes, customer profitability, and product usability. A firm's capacity to collect, analyze, and exploit this data provides interesting profit opportunities for a solution provider to achieve economic rents whether by developing new solutions (growth) or increasing the efficiency of its internal operations (productivity):

> Our focus will be on making machines intelligent and aware of their own condition and networking them to create real-time visibility for enhanced safety and productivity. This

> unique service will differentiate us from our competitors and warrants a price premium. (Annual report 2013/LMP)

Solution providers possess valuable *technology-development capabilities* that provide opportunities for differentiation. Technology-development capability emerges from a solution provider's ability to leverage its customer understanding and in-house development (R&D) activities. This requires active collaboration, knowledge sharing and joint sense-making between field-service workers, and sales and R&D personnel. Patents and innovations are manifestations of this technology-development capability:

> Our history of innovation is one of our success factors. We have always made systematic and long-term investments into our R&D capabilities. In striving toward serving customers to perfection, we explore technologies in other industries and monitor changing markets, trends, customer needs, and working methods. We have introduced a wide range of major innovations throughout the years and have over 3,000 industry related patents. (Public document 2015/LEP)

Another key strategic capability is that of *mergers and acquisitions,* a term that encapsulates a solution provider's capability to conduct successful corporate acquisitions following the identification of undervalued firms in the market, and to integrate the acquired firms into the focal company to enhance performance and shareholder value. Five of the nine solution providers investigated demonstrated growth strategies employing an aggressive M&A strategy. One of the case firms executed very risky and large-scale acquisitions in its early years to challenge established manufacturers. In the course of acquiring over 250 companies in the previous 15 years, this firm also acquired a competitor that was twice its size. Through acquisitions, the studied firms have aimed to increase the number of service contracts, acquire new customers, develop new technologies and competencies, and increase their market knowledge and presence.

> Much of our growth has been organic, although we have a strong acquisition track record as well. We have acquired almost 100 companies over the last 40 years since the beginning of the internationalization in the early 1970's. (Public document 2016/LMP)

A *value quantifying capability* plays a critical role in providing a solution provider with competitive advantage. The term refers to the solution provider's ability to sell solutions and life-cycle services to its customers because of its capability to quantify and communicate customer value appropriately. The extant literature acknowledges that product-centric firms lack the preparedness to sell solutions because they do not have the skills to identify, quantify address customers' value drivers during the product life-cycle. Respondents highlighted the need to identify customers' value drivers, focus on customers' business needs, and create connections with managers ranking high in the customer's organizational hierarchy. Solution sales require longer sales cycles and an understanding of the customer's strategic movements, needs, and business goals.

> You can sell the product to the designer or to the maintenance guy, but when we are selling solutions, we are moving higher up in the customer's hierarchy. It's futile to tell people working on the operative level that we can do the job on their behalf. That wouldn't be a good message for them. (CEO/V&P)

Project management capability refers to the field personnel's ability to handle moments of truth and to keep the firm's value promises such as project delivery times. This capability is required when preparing bids and executing projects successfully. These capabilities include the ability to orchestrate resources and processes from both internal and external actors to eliminate waste and increase customer value. Case companies' project management capabilities enabled them to participate in invitation for bids (IFB) by submitting proposal on a specific project and executing the project in time.

> After we have sold the project, I think that the value of our other activities increases. We are capable of managing the entire project from installation to delivery. We are quite independent when coordinating the project. We don't disturb the customer too much during the project but when delivering the solution to the customer, they are involved in implementation too. (Chair of the board/FP)

The solution provider's ability to effectively manage its supply chain was highlighted as a critical capability, and labeled *supplier network management capability*. This accords with solution provider's ability to create, maintain, and develop its supplier network to ensure that suppliers support the firm's quest for competitiveness, innovativeness, and cost-efficiency. The case companies need supplier network management capabilities to foster flexible delivery when providing solutions. The effective orchestration of a supplier network supports an improved capacity to utilize a supplier's resource base when additional capacity is needed. The studied firms created their own (mini) ecosystems, consisting of their system suppliers, component manufacturers, dealers/distributors, and pilot customers. Their collaboration was characterized by close physical and social cooperation, open and active knowledge-sharing practices, mutual goal setting, moderate interdependence, and a high level of trust among the parties. One executive summarized the importance of key suppliers to the solution provider:

> For a successful company, key suppliers and subcontractors are strategic partners that create added value …Supplier who understands what our customers expect from us and can help us to support us in our operations, is valuable asset for us. Utilizing our suppliers' innovativeness, we can faster increase our competitiveness and create added value for our customers (CPO/LMP)

Value co-creation capability accords with a solution provider's ability to create, develop, and retain long-term customer relationships, to address changing customer needs and requirements, to co-produce offerings, and to co-create value. Building such a capability typically requires relationship-specific

investments, relational structures, and social capital from both dyads. Many of the case companies highlighted the importance of creating strategic partnerships with the dedicated customers:

> Our operations with our customers are based on close collaboration with them. We talk about strategic partnership which means that we are having a very long-term and close interaction with them (Marketing and Sales Director, ArP)

The identified strategic capabilities typically require a long time to evolve, as does managers' cognition of critical and distinctive resources, resource-specific investments, and operational excellence. Strategic capabilities enable the industrial solution provider to acquire economic rents within the industry because of scarcity, rareness, inimitability, and value derived from the implementation of resource–process combinations. Table 5 wraps up the solution providers' capability components, illustrations of manifestations of the dedicated capability blocks and the case firms possessing the dedicated strategic capabilities.

Table 6. Solution providers' capability components.

Dedicated strategic capability	**Components of strategic capability (Key resources + strategic business processes)**	**Quotation**	**Interpretation**	**Companies in the sample possessing the capability**
Fleet management capability	<u>Resource combinations</u> -Installed base of products, smart technologies and existing service contracts -After-sales service depots, field personnel and service network <u>Strategic business processes</u> -Productivity-increasing business processes -Customer-value enhancing business processes	"Over the next few years, LEP will connect its global maintenance base of more than one million units to cloud-based services. By gathering the vast amounts of data from equipment operations and using sophisticated analysis and connectivity, downtime can be minimized, and repairs carried out more quickly" (Press release/LEP)	Fleet management capability creates economic rents when the firm is able to combine product usage and customer data to optimize its service operations and develop solutions that enable its customers to better follow and track equipment-related data	5/9 (LEP, LMP, HVP, AP, V&P)
Technology-development capability	<u>Resource combinations</u> -Collaboration between R&D personnel and field-service workers -Linking customer	"We have a group of product managers who receive a great deal of feedback. They filter and prioritize that	Integrated solution provider benefits from the integration of product and service business information as	7/9 (LEP, LMP, HVP, AP, ArP, FP, LI

	understanding to technology development process <u>Strategic business processes</u> -Innovation-enabling business processes -Customer-value enhancing business processes -Productivity-increasing business processes	information for our R&D. In addition, we have a product council system in which all relevant fields are involved and all of the big decisions are made and channeled. Thus, we aim to achieve a consensus. This means that nobody is a rainmaker or a king and that he/she could come from a sales trip and completely renew our R&D work…This means that we have structures that enable us to systematize our processes and increase our speed…Continuous improvement means that R&D receives feedback straight from the maintenance and product managers". (CEO/HVP)	product development receives straight end-user feedback from the field-personnel and customers whereas service business gets newest product information from the R&D	
M&A capability	<u>Resource combinations</u> -Financial resources -Back-office analysts and strategy team involvement -Top management commitment -Post-merger integration (human resources management) -Technology, offerings and organization cultures integration <u>Strategic business processes</u> -Productivity-increasing business processes (due diligence) -Customer-value enhancing business processes	"The acquired firm is integrated into ours immediately. Our policy is that we possess only a few brands. There are always exceptions, which are strategic decisions, but essentially, acquired firms are immediately renamed" (Area manager/LEP)	Creating an M&A capability is difficult because most of the acquisitions fail. However, firm can benefit from M&A's if it succeeds to evaluate and integrate different organizational cultures in a complementary way. Also experience from the acquisitions increases likelihood of their success	5/9 (LEP, LMP, FP, ArP V&P)
Value quantifying capability	<u>Resource combinations</u> -Dedicated integrated-solutions sales force -Field personnel (technicians and service workers) <u>Strategic business processes</u> -Customer-value enhancing business processes	"Quantifying the delivered value to the customer is really important today. Developing sales competencies has become vital. We need to improve our productivity in the field and simultaneously establish the value to the customer of the service we deliver" (Area manager/LEP)	Quantifying and communicating customer value appropriately enables solution provider to sell integrated solutions to the customers' top managers	5/9 (LEP, LMP, HVP, MWI, L&P)
Project management capability	<u>Resource combinations</u> -Field personnel -Network management -Communication to the customers <u>Strategic business processes</u> -Productivity-increasing business processes -Customer-value	"Compared to our competitors, our project management, and product installation competencies are superior. Our long-time management traditions, refined customer-oriented organization, high service level, and	Project management capability contributes to the effective delivery of integrated solutions to the customers	3/9 (LEP, FP, MWI)

	enhancing business processes	ability to manage our competent field personnel enable us to achieve process benefits. We differentiate ourselves from our competitors through total excellence in services" (Area manager/LEP)		
Supplier network management capability	Resource combinations -Suppliers' resources and capabilities -Procurement team -Relationship-specific investments and relationship's management and development teams -Trust between the partners Strategic business processes -Productivity-increasing business processes -Innovation-enabling business processes -Customer-value enhancing business processes	"We want to be the preferred partner in our industry. We want to be the first choice among our suppliers, our end-customers, and the contractors who buy our products. Partnership is a modus operandi that aims at transferring knowledge from one partner to another partner, which creates earnings for all the actors within the chain" (Chair of the Board/HVP)	Managing the upstream network effectively enables manufacturer to develop solutions cost-effectively. Moreover, utilizing suppliers facilitates manufacturer to create novel solutions	5/9 (LEP, LMP, HVP, AP, LI)
Value co-creation capability	Resource combinations -Customers' resources and capabilities -Key account managers and relationship's management and development teams -Relationship-specific investments and structures -Social capital (trust among the parties) Strategic business processes -Customer-value enhancing business processes -Innovation-enabling business processes	"We have a very long historical collaboration. We have a named contact person from them who represents the company. He has been collaborating with us for 40 years. We also have a joint steering group. I am the chair of this steering group, and we meet with their managers with regularity. Additionally, the real estate manager, and a few managers responsible for upkeep are involved from our side. We also have a manager who collaborates with their account managers on a daily basis. We have joint development projects in which they can present their suggestions, ideas, and proposals" (Director of Real Estate and Procurement/LEP customer)	Ability to create, develop and retain customer-relationship enables solution provider to make long-term profits during the product life-cycle	8/9 (LEP, LMP, HVP, ArP, FP, LI, MWI, V&P)

5. Discussion and implications

5.1. Theoretical contribution

The present study was conducted to understand the underlying capabilities that generate competitive advantage to the solution providers. The study's theoretical contribution is threefold. First, it identifies the manufacturers' distinctive resources that support the formulation of strategic capabilities. Second, the study sheds light on the strategic business processes that convert resources into capabilities (Day, 1994; Long and Vickers-Koch, 1995; Rabetino, Kohtamäki and Gebauer, 2016). Finally, this study advances the literature on solution provider's capabilities by identifying seven strategic capabilities that support a solution provider's ability to generate above-average profits.

Regarding the first contribution, the present study identifies six distinctive resources for the solution providers: 1) the installed base of products and service contracts (e.g., global installed based, quality data of the installed base and servicing), 2) physical and technological assets (e.g. product knowledge, remote diagnostics), 3) intellectual capital (e.g., patents, brand, references), 4) human assets (e.g. top- and middle-management, solution personnel), 5) financial assets (e.g., cash flow, loans), and 6) external assets (e.g., supplier network, intermediaries, customer base). These pure resources that do not create competitive advantage *per se*, correspond the concepts of threshold capabilities (Long and Vickers-Koch, 1995) or simply, resources (Spring and Araujo, 2013), in the prior literature. In line with the extended resource-based view (see Spring and Araujo, 2013; Tuli *et al.*, 2007), our study suggests that manufacturers should consider their suppliers' and customers' capabilities as their key resources. Paradoxically, the ability to exploit the supplier network was a bottleneck for many manufacturers. As the manufacturer has to rely on other firms, it loses a degree of control. However, the best solution providers studied were able to utilize their supplier network to reduce their production and transaction costs and increase the number of innovations and value to the end-users (Dyer, 1997; Paiola *et al.*, 2013; Story *et al.*, 2016). As it is assumed vertical disintegration among manufacturers will increase in the future (Jacobides, 2005), solution providers should develop capabilities related to their supplier networks.

Finding an optimal combination of resources creates the basis for strategic capabilities. Finding the appropriate combination is a constant struggle in the course of reconfiguration (Huikkola *et al.,* 2016).

As the second contribution, we distinguish three strategic business processes that steer a firm's activities toward its strategic objectives, namely: 1) productivity-increasing business processes, 2) customer-value enhancing business processes and 3) innovation-enabling business processes. Regarding the productivity-increasing business processes, the results demonstrated that the most successful solution providers continuously and systematically tended to seek new ways to do more things with fewer resources. They were also disciplined in terms of increasing their operations' productivity—we found evidence of processes, such as lean management, solution standardization, or back-office industrialization (Davies, Brady and Hobday, 2006; Reinartz and Ulaga, 2008) being utilized to reduce costs or improve output to inputs ratio. The data demonstrated that the studied solution providers applied customer-value enhancing business processes to increase their customers' productivity, address their needs and business processes, and identify, quantify, communicate, and verify that they were providing value to the customers (Töytäri and Rajala, 2015). These customer-value-addressing business processes were also the most difficult for the solution providers because of their history as product-oriented companies. Changing the mindset and capabilities from the development of product features to customer value is something that does not happen overnight: It requires active collaboration with the customers, and an ability to understand the business needs and processes of the customer and even of the customers' customers. Finally, innovation-enabling business processes steer the firm's objectives beyond the ongoing business development activities. Innovation-enabling business processes target delivering growth in the long-term from new business areas. The biggest challenge in applying this strategic business process successfully relates to a short-term mindset prevailing among management; however, in the long run, this might be the only viable business process the managers should pay attention to.

Regarding the final contribution, seven strategic capabilities were identified that deepen and extend the current understanding of the sources of solution providers' competitive advantage. A fleet management capability accords with a solution provider's ability to track and utilize fleet data (e.g., production efficiency and product usage data) in a way that creates cost-benefits for the solution provider or increased value for the customer. A technology-development capability offers a competitive edge for those solution providers able to cement their positions as technology leaders. This technological leadership originates from the firm's ability to develop breakthrough solutions through attracting, motivating, and retaining talented engineers and cross-functional development teams. Furthermore, the data extracted for the current research suggests that building an organization culture that permits risky initiatives, failures, and unconventional thinking resonates with the firm's ability to innovate. This capability allows the solution provider to maintain premium pricing, hence creating economic rents for the firm. Solution providers who possess an M&A capability are able to profit through synergy, density, and customer benefits. As only a minority of M&As is successful for the buyer (Dyer, Kale and Singh, 2004), building this capability is both rare and difficult because of information asymmetries and integration challenges. However, when the screening, timing, execution, and integration processes are accomplished successfully, a solution provider can generate above-average profits in the markets. The solution provider's ability to execute complex projects is a strategic capability that manifests itself in delivering projects on time and cost-effectively. A firm's ability to sell solutions, that is, a value quantification capability, accords with a solution provider's ability to identify, quantify, communicate, and verify customer value appropriately (Töytäri and Rajala, 2015). In the context of solution provision, this capability requires understanding the customer's key business and decision-making processes. In practice, selling solutions requires a capability to communicate with the customer's top managers, to understand their business environment, and to address their business rather than merely their technical concerns. The form of strategic capability addressing solution provider's upstream control was termed supplier network management capability. Hence, the supplier network is a valuable asset for any company, but few are able to exploit this exogenous resource base successfully because of harmful

management practices or lack of trust (Dyer, 1997; Dyer and Singh, 1998). The findings of this study indicate that building an innovative and cost-efficient supplier network can be a key source of a competitive advantage for the solution provider. Finally, value co-creation capability refers to a solution provider's downstream control, that is, the capability to build long-lasting and profitable customer relationships that generate life-cycle benefits for both of the parties.

5.2. Managerial implications

The results of this study can guide managers responsible for solution business development in steering their strategic initiatives toward dedicated capability areas. Specifically, the present study provides valuable information for manufacturing firms' executives that attempt to profit from the provision of solutions. First, managers can utilize the presented model to identify capability gaps and prioritize their development activities. As the firms typically lack both managerial and financial resources, managers can decide which capabilities they should create, invest in, reinforce, or even release in the future. Establishing strategic development programs based on strategic capability for the next three to five years is an example of a concrete practice executives might use to follow-up the development of a dedicated strategic capability. For instance, if a manufacturer considers that it is not able to take full advantage of its extant supplier base, the firm could establish a dedicated strategic development program focusing on supplier network development. Although such a program would not improve the situation alone, its strategic role within the company is likely to be justifiable. Following the development of different KPIs relating to dedicated capability areas (such as supplier innovativeness and cost-efficiency) would permit a firm to invest in this particular capability area, and potentially, increase the solution provider's revenues, profits, or balance sheet benefits in the long run. Furthermore, establishing a strategic development program ensures an initiative receives executive-level approval, which can increase its chances of success. Second, managers can benchmark practices related to the application of strategic business processes, particularly to those enabling innovation. For instance, a firm might apply a 70/20/10 rule or

free work time allocation model to help itself in its resource allocation decisions. A 70/20/10 rule means that 70% of investments are allocated to firm's core business development, 20% of investments are allocated to emerging businesses, and 10% of total investments are allocated to new initiatives (see Schmidt and Rosenberg, 2014). A free work time allocation means that personnel can spend a dedicated share of their total work time (typically 15–20%) to advance their own projects (see Eisenhardt and Sull, 2001). These examples can potentially facilitate the creation of breakthrough solutions and eventually foster a competitive edge for the solution providers.

5.3. Limitations and further research

As with any research, the present study has limitations that should be addressed. As the study is qualitative in nature, the results cannot be generalized to the population of solution providers (Eisenhardt, 1989). Therefore, future research could cover generalizable quantitative studies that review capability gaps, and strategic business processes that have the greatest impact on business performance in different industries. As the studied firms operate in capital-intensive, cyclical, and mature industries, and because strategic capabilities are considered to be static, future research would benefit from studying firms operating in more dynamic and R&D-intensive industries, where the ability to change capabilities plays a more critical role. This approach would increase understanding of how manufacturers alter their resources when moving toward solutions. Moreover, as the competition in service markets grows stiffer and some of the after-sales services (e.g., spare parts) become commoditized, it would be fruitful to study the capabilities required to provide pure performance-based solutions such as operations and maintenance services. Future studies should investigate what type of capabilities (e.g., ecosystem or platform capabilities) manufacturers need to build, leverage, and release to adapt value-based business models to ensure customers pay for outcomes rather than products and services. Future studies should move toward a micro-level perspective on capabilities, and begin to study the micro-foundations or micro-level practices behind capability development, and the coproduction of offerings, resources, and processes.

Moreover, critical research is needed to understand the narratives of capability development, as alternative narratives may exist (Luoto, Brax and Kohtamäki, 2017). No single correct path to success exists, but alternative paths should be considered.

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