

DYNAMIC CAPABILITIES OF A SOLUTION PROVIDER: A CROSS-CASE ANALYSIS

ABSTRACT

Building on the dynamic capability approach to strategy, this study contributes to industrial service literature by analyzing how industrial solution providers alter their resource-base when moving successfully from products to solutions. Our results are based on 35 senior manager interviews and extensive secondary data collected from industries' leading solution providers struggling to transform from product-business towards services and solutions. Studied industrial manufacturers were selected for the study based on a representative quantitative dataset. The results of this study demonstrate variety of practices utilized by the solution providers. Those practices were recognized by utilizing the following dimensions: 1) creating new resources/capabilities and 2) leveraging, 3) reducing and 4) releasing their existing resources/capabilities. Identified practices provide means to improve a manufacturing firm's dynamic capability to reconfigure resources.

Keywords: Industrial services, servitization, integrated solutions, dynamic capability, resource reconfiguration

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Competitive paper

INTRODUCTION

“We have previously been a product-company. We used to sell products and equipment. Today we sell services the way that our R&D, production and maintenance are based on customer needs and how our products and services can help our customers’ lives...This company has consistently and systematically transitioned from product-oriented company towards service-business company. We also try to change hardware into services and help people to realize what’s the function behind the product.” (Area manager/solution provider)

Product manufacturers have transitioned towards services and integrated solutions to gain various strategic, economic and marketing benefits in the markets (Gebauer, Fleisch & Friedli, 2005). Extant literature suggests that adding services *“is the longest-lasting source of revenues to sellers and requires the smallest investment. Companies that ignore the aftermarket do so at their peril”* (Cohen, Agrawal & Agrawal, 2006: 12). Prior studies (see also Neu & Brown, 2005; Oliva & Kallenberg, 2003) have been almost unanimous in suggesting that integrating services is a new goldmine for goods-dominant firms. However, studies report that only 20% of manufacturers succeed to implement their service strategies and one fourth is unprofitable with their service and solution businesses (Reinartz & Ulaga, 2008; Ulaga & Reinartz, 2011; Stanley & Wojcik, 2005). Kohtamäki, Partanen, Parida and Wincent (2013) highlight the non-linear relationship between industrial service offering and sales growth to suggest a need for extensive service emphasis when seeking performance benefits from service offering. Fang, Palmatier and Steenkamp (2008) suggested similar effect to firm’s market value. Reinartz and Ulaga (2008) noted that firms who failed tried to transfer themselves too quickly, they did not standardize their service processes, they were not able to utilize effectively their external resources and sales personnel did not keep up with the new requirements needed in the service business. However, iconic companies such as IBM, Otis, KONE or GE have been successful in implementing a strong service strategy as currently services account for most of their revenues and profits (Neu & Brown, 2005). All in all, firm’s ability to reconfigure resources and develop its capabilities (Paola et al. 2013) for improved solutions integration is of great importance.

Oliva and Kallenberg (2003) among others (see also Penttinen & Palmer, 2007; Reinartz & Ulaga, 2008; Ferreira et al. 2013) provide step-by-step pathway for manufacturers to move successfully towards service and solutions business. Oliva and Kallenberg (2003) suggest that manufacturers should first consolidate product-related services under one roof, then create separate organization and infrastructure to market and deliver services. Third, they should expand whether to relationship-based or process-centered services and finally, manufacturer should take over the end-user’s operation. Prior studies (Gebauer, Fleisch & Friedli, 2005, Oliva & Kallenberg, 2003; Neu & Brown, 2005; Agarwal & Selen, 2009) acknowledge that firms should develop new resources and capabilities when moving towards services and solutions but provide little empirical evidence on how manufacturers actually alter their resource-base to facilitate corresponding organizational renewal. Thus, extant literature provides framework and models how to successfully manage transition process but overlooks how manufacturers create new resources/capabilities and leverage, reduce and release their existing resources/capabilities to follow the initiated strategic shift towards service-dominant business logic. Despite the

importance of this topic, the existing literature on industrial services is yet without an in-depth analysis on the needed dynamic capabilities when implementing an industrial service strategy.

Our study intends to fill this gap by studying *how successful solution providers' alter their resource-base when transitioning from products to services and integrated solutions?* The present study contributes to industrial services literature by analyzing the practices of 1) creating, 2) leveraging, 3) reducing and 4) releasing manufacturer's existing resources and capabilities. The study draws from an abductive interpretation of literature review, longitudinal primary and extensive secondary data collected altogether from nine successful solution providers that were identified based on a quantitative dataset.

INDUSTRIAL SERVICE AND SOLUTION BUSINESS: A DYNAMIC CAPABILITY APPROACH

Industrial service literature has increased significantly during the last years (Lightfoot et al., 2013). An abundant body of research from various communities of research (e.g., product-service systems, service management, service marketing, service science, operations management, and service engineering), has identified many related but frequently detached research streams that address product-service combinations for hybrid value creation (Baines et al., 2009; Baines, Lightfoot, Evans, et al., 2007; Boehm & Thomas, 2013; Lightfoot et al., 2013; Wang et al., 2011; Velamuri et al., 2011). Management and industrial marketing scholars propose that firms “go downstream” (Wise and Baumgartner, 1999) to change their orientation from a “product-centric to a service and customer-centric” organization (Galbraith, 2005). They usually name this strategic move as “servitization” (Vandermerwe and Rada, 1988), “servicisation” (Quinn et al., 1990), “servicification” (Normann, 2001), “servicizing” (Rothenberg, 2007), “tertiarisation” (Léo & Philippe, 2001), “value migration” (Davies, 2004), or “service infusion” (Kowalkowski et al. 2012). Within the community known as product-service systems (PSS), the process involves designing and selling PSS to deliver desirable user functionality while attaining long-term societal impact through environmentally sustainable production and consumption (Baines, Lightfoot, Steve, et al., 2007; Jovane et al., 2008; Manzini & Vezzoli, 2003; Mont, 2002). Finally, marketing academics mostly describe this process either as a change from the manufacturing paradigm to the service paradigm (Gummesson, 1994) or as a shift from “goods-dominant logic to service-dominant logic” (Vargo and Lusch, 2004).

Researchers highlight that services and integrated solutions facilitate manufacturer to gain more stable source of revenues (Mathe & Shapiro, 1993), increase customer-loyalty and profits (Palmatier, Dant, Grewal & Evans, 2006; Palmatier, Dant, Grewal, 2007) and provide various strategic, economic and marketing benefits (Gebauer, Fleisch & Friedli, 2005). Prior studies suggest that manufacturers should move towards services incrementally (Oliva & Kallenberg, 2003; Reinartz & Ulaga, 2008). They must create new structures and measurement/reward models to correspond to new requirements that customer-oriented service business-model induces (Gebauer, Fleisch & Friedli, 2005; Neu & Brown, 2005) while standardizing and industrializing their internal and customer processes (Reinartz & Ulaga, 2008; Mathysens & Vandembemt, 1998), and reorganizing their service sales to develop competencies to sell more comprehensive services and solutions (Reinartz & Ulaga, 2008; Ulaga & Reinartz, 2011). Thus, for an effective implementation of a solution-oriented business model, companies may develop a new set of resources and capabilities (Davies & Brady, 200). In particular, the provision of

solutions calls for new specific capabilities such as system integration and project management, IT systems, consulting, financial competences, delivery, and post-sales service competences (Baines et al., 2011; Brady et al., 2005; Davies, 2004; Osegowitsch & Madhok, 2003; Prencipe, 2003).

Resource-based theory proposes that firm's sustainable competitive advantage is based on its possessed or controlled resources and capabilities which are considered valuable for the firm, rare within the industry and costly imitated by its competitors (Barney, 1991; Barney, 1995; Wernerfelt, 1984). These *core/strategic capabilities* differentiate firm strategically from its competitors and enable above-average economic rents in longer-term within their industries (Leonard-Barton, 1992; Long & Vickers-Koch, 1995). Ulaga and Reinartz (2011) identify four critical resources of goods-manufacturers who provide industrial services and solutions: 1) product usage and process data derived from the firm's installed base of physical goods, 2) product development and manufacturing assets, 3) an experienced product sales force and distribution network, and 4) a field service organization. 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.

Dynamic capability approach (DC), on the other hand, highlights how firm's processes to use resources change as the markets emerge, split, evolve, collide and die (Eisenhardt & Martin, 2000). DC suggests that firms have to integrate, reconfigure, gain, leverage and release their resources and capabilities to address ever-changing business environments (Eisenhardt & Martin, 2000; Danneels, 2011; Teece, 2007). Teece, Shuen and Pisano (1997) underline that firms need to sense new market opportunities, seize them and reconfigure their resources to address rapidly changing environments. Birkinshaw & Gibson (2004) note that to gain above-average profits in the long-run, firms should be able to simultaneously follow advantage-seeking behavior and entrepreneurial behavior. First references to exploitative behavior suggesting the importance of leveraging firm's existing resources/capabilities more effectively whereas latter accords with explorative behavior emphasizing risky, proactive and innovative activities firm should accomplish to create wealth (Covin & Slevin, 1989; Lumpkin & Dess, 1996). Scholars call firms who are able to successfully manage both evolutionary and revolutionary change as "ambidextrous organizations" (Birkinshaw & Gibson, 2005; Tushman & O'Reilly, 1996). In sum, dynamic capability literature (see Wang & Ahmed, 2007) stresses firm's overall ability to learn and alter its resource-base to create change itself (innovation capability) or correspond to altered circumstances (absorptive capability). Without ability to change, firm may face "exploitation trap" (Sirén, Kohtamäki & Kuckertz, 2012), "learning trap" (Huikkola, Ylimäki & Kohtamäki, 2013) or its core capabilities may become its *core rigidities* that hinder firm's ability to change (Leonard-Barton, 1992).

METHODOLOGY AND DATA

This study applies a qualitative strategy based on multiple case studies because of the complexity of the topic and the lack of evidence at the micro level. Altogether, to answer the research

question, researchers collected and utilized data from a) 39 interviews collected from 3 pilot cases, b) Quantitative dataset that enabled the case selection, c) primary data from 35 interviews in 9 cases, and d) Secondary data from annual reports, websites etc. from the 9 studied cases.

Pilot studies

We conducted altogether three pilot studies to familiarize ourselves with the method and to develop our semi-structured interview template (Yin, 1994). At this stage, we interviewed 39 senior managers from three firms who had transitioned or were trying to transfer themselves from product-dominant logic towards service-dominant logic. Pilot interviews were recorded with permission and this effort resulted in 306 pages of transcribed text. Highly profitable piloted firms' annual revenues were 600, 3000 and 4500 million euros, services accounted for 17%, 34% and 48% of firms' total revenues, and market values were 650 million euros, 1.2 billion euros and 4.2 billion euros respectively. In addition, we collected extensive secondary data from firms' 1) annual reports since year 2000, 2) press releases since 2000, 3) latest business magazine stories and 4) the histories. These efforts resulted in 2731 pages of data from annual reports, 1400 documents of press releases, 1444 pages of data from firms' histories and 430 pages of industry reports. Extensive data collected from these three pilot firms enabled us to produce a within-case table representing information on firms' 1) key products and services, 2) installed base of products (total fleet or number of service contracts), 3) manufacturing and physical service sites, 4) intangible assets (e.g., number of patents and brand values), 5) human assets (e.g., share of service personnel), 6) financial assets (e.g., key performance indicators), 7) external assets (e.g., number of suppliers and customers), and 7) modes of altering above-mentioned resources (e.g., creating, leveraging, reducing and releasing resources). Pilot cases enhanced and systematized our data collection process in forthcoming actual cases and provided insights into the studied phenomenon. Pilot cases facilitated and systematized our data analyzing processes later on as we started to examine relevant literature in conjunction with data collection process. In addition, pilot studies enabled us to forge more specific and relevant questions for other interviewees as piloted cases helped us to discern and structure relevant themes according to industrial solution business and possessed resources and strategic capabilities.

Case selection

Based on the insights gained during the pilot studies, we have selected our case companies from a generalizable quantitative dataset collected in Finland in 2010. The quantitative data were collected using a survey that had been sent to all Finnish industrial product manufacturing firms (SIC 28) employing 20 or more people. In total, 115 of the 404 firms targeted responded, corresponding to a satisfactory response rate of 28.5% and a generalizable data that corresponded to the studied population based on the analysis of a number of demographic variables. Studied cases such as KONE Oyj, Konecranes Oyj, Ponsse Oyj, Patria Oyj, Aspo Oyj and Valtra (AGCO) were identified for in-depth qualitative analysis based on a firm's a) service sales percentage of the firm's total revenue, b) long-term profitability (ROI% and ROCE%) and c) global market position. This selection criteria were used because we wanted to study in depth the leading manufacturers who had taken the initiative to integrate services into their offerings, and were clearly successful based on implemented service strategy, profitability and market position.

The number of studied cases also aligns with Eisenhardt's (1989) suggestion of appropriate number of cases (between 4 and 10).

All of the studied nine case firms were their industries' leading firms globally and services accounted for 15 - 50 % of their total revenues (median value 20.0 % and mean value 27.2 %). According to Fang et al. 2008, services typically need to account for 20-30 % of manufacturer's total revenues to gain enough critical mass to increase firm's shareholder value. All of the sub-sectors where studied firms operated were mature, consolidated, cyclical and capital intensive representing characteristics of industries where western manufacturers have typically intended to differentiate themselves through services and integrated solutions (Mathyssens & Vandembemt, 2008; Wise & Baumgartner, 1999). Studied firms revenues ranged from 30 million euros to seven billion euros Studied firms revenues ranged from 30 million euros to seven billion euros (mean value 1200 million euros, median 312.8 million euros), firms employed people from 60 to almost 45 000 (mean 7000 employees, median 1027 employees) and they possessed service contracts as far as to one million units.

Data collection process

Before sending out the survey to targeted firms' representatives, two of the leading researchers were involved in making phone calls to all 404 targeted firms' CEOs to identify profit-and-loss responsible managers in charge of developing firms' service and solution businesses. This effort facilitated, motivated and encouraged selected respondents to participate in our survey. Survey provided us generalizable information on strategic role of service and solution business within the company, firms' key performance indicators and people responsible for developing their service and solution businesses.

Our case companies are leading firms representing different industries and various sized companies to study in depth organizational capabilities in industrial solution business. Altogether, a single researcher conducted 35 semi-structured interviews between spring 2010 and autumn 2013 with firms' senior managers and strategic customers' and system suppliers' key decision makers in Finland. This protocol ensured that interviewer was able to make similar additional questions and observe similarities and differences across the cases during the interviews. Respondents of firms' system suppliers and strategic customers were selected to participate in interviews whether by requesting firm's senior manager to name the most suitable person to answer the study or by making a phone call to firm's operator to name a person responsible for developing the named business relationship and assuring from the respondent that he/she was an appropriate person to respond to the questions. Because the interviewees held their personal views of each firm's competitive advantage, also the contents of the interviews were interpretative in nature. Given these potential biases, the strategic suppliers' and customers' responses were compared with the studied firms' representatives' responses and vice versa to increase study's reliability and credibility. All 19 interviewees from the studied firms held senior manager positions such as CEO, Chairman of the Board, Service Director, Marketing Director, Marketing and Sales Director, Global Service Manager, Service Manager, Area Manager, or District Manager. Altogether 19 interviewees from system suppliers and strategic customers held positions such as CEO, Product Manager, Head of Business Unit, Global Key Account Manager, Key Account Manager or Director of Real Estate and Procurement. All of the respondents had

profit-and-loss responsibility and were responsible for developing certain business unit or business relationship. The interviews ranged from 45 minutes to 200 minutes an average interview lasting 72 minutes and all of the interviews were recorded with permission. The interviews were transcribed verbatim shortly after the interviews had taken place, resulting approximately 557 pages of transcribed text (Single spaced, font size 12).

Additionally, extensive secondary data were analyzed to complement primary data and to cover possible topics that were not found from the interviews. We collected and analyzed altogether 3953 pages of data from annual reports since 2000, 3174 pages of firm histories, 996 documents of press releases/stock exchange releases since 2000 and numerous stories of firms from Finnish and international weekly or monthly business magazines. Eventually, secondary data collected were mirrored with the primary data to get comprehensive and in-depth understanding of each firm's similarities and differences with regards to their success factors, resources, processes and strategic capabilities.

TABLE 1
Sample and data description

| Respondents' titles, length of the interviews/meetings and pages of transcripts | Firm type and size (share of service revenues) | Main sources of secondary data |
|--|--|---|
| President of Service business line (61min/21 pages) Chief Executive Officer (60min/23 pages) | Pilot firm: 4500 million euros (services account for 48% of total revenue), 18 000 employees | Annual reports: 1650 pages Firm histories: 488 pages (4 histories) Press releases: 1296 documents Business magazine stories |
| Chief Executive Officer (60 min/23 pages) | Pilot firm: Annual revenue approximately 3000 million euros (services share 34%), 12 000 employees | Annual reports: 1650 pages Firm histories: 1175 pages (5 histories) Industry history: 367 pages Press releases: 1296 documents Business magazine stories |
| Chief Executive Officer Business development manager*2 Product line manager*6 Project manager*2 | Pilot firm: Annual revenue approximately 660 million euros (services share 17%), 2500 employees | Annual reports: 1081 pages Firm history: 142 pages Industry report: 63 pages Press releases: 100 documents Business magazine stories |

| | | |
|---|--|--|
| Divisional Director Master builder Supervisor | Pilot firm customers (revenues were 517, 670 and 800 million euros) | - |
| Area Manager (50 min/11 pages) Service Area Manager (60 min/16 pages) Service Business Director (60min/37 pages) | Case firm: Revenue approximately 6500 million euros (services share: 50%) and 40 000 employees | Annual reports: 961 pages Histories: 1593 pages (4 histories) Interviews in television/Internet (CEO/Chairman of the board) Industry reports Press releases: 273 documents Business magazine stories |
| Director of Real Estate, Procurement and Corporate Social Responsibility (60 min) | Strategic customer: Revenue 2100 million euros and 15 500 employees | Customer firm history: 532 pages |
| Key Account Manager (60 min/5 pages) | Strategic supplier: Annual revenue 400 million euros and 1500 employees Case firm: Annual revenue approximately 2100 million euros (services account for 40% of total revenues), 12 000 employees | Press releases and stories of the relationship |
| Service Director (70min/13 pages) District Manager (80min/19 pages) District Manager (90min/21 pages) Area Manager (85min/20 pages) Director of product and services development (120 min) | Strategic customer: Annual revenue approximately 3000 million euros (services share: 34%), approximately 12 000 personnel | Annual reports: 1189 pages Histories: 676 pages (2 histories) Press releases: 403 documents Business magazine stories |
| Manager (70min/20 pages) Product Manager (70min/20 pages) | Strategic supplier: Annual revenue 400 million euros and 1500 employees | Annual reports: 1650 pages 1175 pages (5 histories) Industry history: 367 pages |
| Global Account Manager (65 min/8 pages) | | Relationship's descriptions in business books |

| | | |
|--|--|---|
| Chief Executive Officer (75 min/19 pages) Service Director (120 min/14 pages) Service Manager (60min/ 16 pages) Global Service Manager (90min/27 pages) | Case firm: Annual revenue approximately 350 million euros (service share 20% of the total revenue), 1000 employees | Annual reports: 906 pages CEO's dissertation: 205 pages History: 60 pages Industry report: 254 pages CEO's presentation in research project's annual meeting Stock Exchange Releases: 209 documents Business magazine stories |
| Chief Executive Officer (60min/10 pages) | Customer: revenue 6 million, employing 35 employees | Relationship's description in trade magazine |
| Head of Unit (70 min/21 pages) | Strategic supplier: revenue 22 million euros, 135 employees | Press releases of the business relationship |
| Country Manager (75min/18 pages) | Case firm: Annual revenue 650 million euros | Annual reports: 348 pages Histories: 486 pages (3 histories) |
| Chief Executive Officer (60min/15 pages) | Strategic supplier: Annual revenue 65 million euros and 250 employees | Relationship's descriptions in a business book |
| Farm entrepreneur (200min/41 pages) | Customer: Local Finnish entrepreneur (no financial data available) | - |
| Sales and Marketing Director (45min/ 7 pages) | Case firm: Revenue approximately 750 million euros (Service share 30%), 3500 employees | Annual reports: 219 pages History: 208 pages Press releases: 111 documents |
| Chairman of the Board (65min/15 pages) | Case firm: Revenue 10 million euros (services share: 15%), 30 employees | Annual reports: 330 pages |
| Production manager (65min/18 pages) | Strategic customer: Revenue 15 million euros, 100 employees | History: 93 pages |

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|--|--|--|
| Chief Executive Officer (60min/ 9 pages) | Strategic supplier: Revenue 13 million euros, 30 employees | - |
| Chairman of the Board (55min/ 9 pages) | Case firm: Revenue 30 million euros (service share 15%), 60 employees | History: 60 pages Industry report: 254 pages |
| CEO/Entrepreneur (90min/23 pages) | No financial data of the customer available | - |
| Area Sales Manager (65min/12 pages) | Strategic supplier: Annual revenue 80 million euros, 300 employees | Press releases and stories of the relationship in trade magazine |
| Sales and Marketing Director (65 min/ 14 pages) | Revenue 41 million euros (service share 35%), 300 employees | History: 381 pages |
| Sourcing Manager (80 min/24 pages) Sourcing Engineer (80 min/24 pages) | Strategic customer: Revenue 4500 million euros (service share 48% of the total revenue), 17 500 employees | Annual reports: 1650 pages Firm histories: 488 pages (4 histories) Industry history: 367 pages |
| Head of Unit (70min/17 pages) | Supplier: Revenue 25 million euros, 200 employees | Story of the relationship in supplier's customer magazine |
| Chief Executive Officer (65 min/ 18 pages) Business Unit Director (80 min/34 pages) | Case firm: Annual revenue 35 million euros (service share 20%), 130 employees | Chairman of the board's presentation |
| Product Manager (60min/17 pages) Pricing Manager (60 min/17 pages) | Strategic customer: Annual revenue approximately 2000 million euros (service share: 23%) and 5000 employees | History: 196 pages Business magazine stories |

| | | |
|----------------------------------|--|---|
| Sales Engineer (65 min/14 pages) | Strategic supplier: Revenue approximately 50 million euros and 450 employees | Relationship's description in supplier's customer magazine |
|----------------------------------|--|---|

Data analysis

Following an abductive process, we repeatedly compared the collected empirical data with the literature on industrial solution business and firm's dynamic capabilities. To clarify and organize the data, we took notes, made memos during the interviews, held several rounds of discussions between researchers regarding the cases, compared the data from different cases and sources to establish similarities and identify differences across the cases. We then started to analyze the data, proceeding from more concrete and unambiguous to the more abstract and ambiguous. We moved from more descriptive to more explanatory (Huberman & Miles, 1994). To analyze the data and to discern and organize substantive issues in terms of how firms' altered their resource-base, we executed a within-case analysis of each firm to understand changes in each firm's resource-base as a stand-alone entity. We then tried to find patterns across the cases through application of cross-case technique (Eisenhardt, 1989; Huberman & Miles, 1994). We used QSR NVivo 10 program to code, list and structure themes found from the data (Richards & Richards, 1994). We first documented the distinctive resources possessed and controlled by the industrial manufacturers. Second, we coded the interviews and complementary data under the sub-themes of resources and modes of altering them. This effort culminated in the production of a within-case table constructed based on the categories of firm's distinctive resources and modes to alter them. Then, cross-case analyses were conducted by analyzing whether these dimensions were present in each firm and in what form they existed in different cases. We intended to recognize patterns and variety between the investigated cases.

To avoid misinterpretation of the data and to increase the study's reliability, we applied data triangulation technique. This involved interviews from studied firms' senior managers, system suppliers' and strategic customers' business directors and analyses of extensive secondary data. This contained data from annual reports, press releases, histories and business magazine stories. Using multiple sources of data, we confirmed that investigated firms' representatives' responses were not biased and that multiple actors shared the same sentiments of the studied firms' most valuable, scarce and inimitable resources. We used a pattern-matching logic to verify our conclusions in within-case analyses (Yin, 1994). In addition, we reviewed the cases in the longer time-period, since spring 2010 until the spring 2014 to examine sources of sustainable competitive advantage. We also applied data auditing technique (Huberman & Miles, 1994) which involved one independent senior researcher (Ph.D) to read and verify our conclusions. Senior researcher was chosen based on his expertise is industrial solution business literature. All the data were provided in NVivo, including primary data, secondary data and codes of sub-themes for a critical review and comparison against our results (Schwandt & Halpern, 1988). Finally, we sent our results and conclusions to studied firms' senior managers via e-mail to further comment our analyses, conclusions and synthesis.

RESULTS

Industrial solution provider's resource-base

Based on our data analyses, we identified six distinctive resources of industrial solution providers: 1) installed base of products and service contracts, 2) physical and technological assets, 3) intellectual capital, 4) human assets, 5) financial assets and 6) external assets. Installed base of products and service contracts include firm's total fleet delivered and accomplished service contracts with customers. This resource category may include for instance after-sales services provided to firm's competitors' products and complementary products (products manufactured by third-parties). Physical and technological assets refer to firm's production plants, R&D centers, sales offices and physical service sites. Intellectual capital is comprised of firm's patents, brands, reputation, licensing agreements, customer/supplier databases, customer references, and big data. Human assets incorporate personnel know-how and their social relations whereas financial assets embody firm's cash flow, profits and loans. External assets reference to firm's system suppliers', component suppliers', dealers', distributors' and customers' capabilities and business relations.

These distinctive resources create a basis and prerequisite for solution provider's sustainable competitive advantage to emerge. However, as the single resources rarely enable the creation of sustainable competitive advantage, resources need to be managed effectively through strategic business processes (Long & Vickers-Koch, 1995). To achieve competitive advantage in the long-run, a firm has to be capable of altering and reconfiguring its resource-base through organizational processes (Eisenhardt & Martin, 200; Teece et al. 1997; Teece, 2007). Hence, a firm needs to be able to adapt to altered business circumstances, absorb new knowledge and/or create new innovations to change existing market structures (Wang & Ahmed, 2007). In sum, firm's key to success in the long-run lies in firm's ability to learn, innovate new or change its resource-base to correspond to altered business conditions. Based on our analyses, we found that solution providers altered their resource-base by: 1) creating new resources/capabilities, 2) leveraging existing resources/capabilities, 3) reducing existing resources/capabilities and 4) releasing existing resources/capabilities.

Creation of new resources

Creating new resources refers to modes how firm explores, integrates and develops new resources, skills and competencies. Danneels (2002; 2011) specify that development of new competencies require second-order capabilities i.e. competencies of explorative learning (Levinthal & March, 1993). Studied case firms created new technologies, new service competencies and market knowledge through hiring managers, engineers and field employees that possessed knowledge with regards to developing service business, remote monitoring technologies (industrial internet) or other technologies that facilitated energy-efficiency or better user-experience. In addition, four case firms reported that they acquired local service firms to accumulate certain market knowledge and small technology companies to gain access to new rising technology areas that may have substantial business potential. Finally, case firms created strategic alliances and co-operated with research institutes to develop new technologies or entry

into the new markets. Basically studied firms created resources which enabled them to get deeper understanding of the customers, their needs and business processes.

Studied case firms' representatives highlighted the importance of explorative behavior across the businesses and functions. Chairman of the board underlined organization's overall ability to question existing organizational procedures and methods to gain sustainable competitive advantage:

"Sales revenues from new elevators were decreasing third year in a row and elevator companies had to grasp to service contracts for some additional revenues. Kone was actively seeking new customers, and the service business units expanded their service operations also to competitors' elevators.

"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 organization's embedded ability to question existing things. We have to question the made decisions and we have to want to change."

In various cases, the interviewees highlighted the firms' need to renew their business by adding new products or services to their portfolio.

"I believe that we all have a need to find an effective and independent product combination, that builds on our competence and fits with tomorrow's expanding markets. This task requires open mind, vision, and ability to make rapid decisions that are based on generally accepted principles. Kone set up as their target to find one third of their revenue from non-European markets."

Case firms relied on strategic alliances when entering into completely new service technologies. New service technologies were channeled to projects which supported the development of solution business as the following quotes selected from one case firm's annual report (year 2002) indicate:

"We have developed new maintenance models to utilize the possibilities that new technology facilitates. We have agreed on collaboration with Nokia that aims at developing GSM technology-based wireless systems to support remote monitoring of our equipment."

"R&D investments are channeled into developing maintenance and modernization services. We develop real-time customer service concept which integrates equipment remote monitoring, field personnel devices, customers' extranet service and our service centers into one service totality."

Finally, the interviewees emphasized those capabilities needed for rapid renewal in difficult economic times.

”...in rapidly changing economic environment those companies strived that were flexible and effective when reacting to new opportunities. Flexibility was created by strong liquidity, continuous technological renewal and effective management, through which resources were reallocated to new emerging opportunities.”

”Pekka (CEO at the time) highlighted flexibility, trimmed organization, seeking new opportunities, firm-level intelligence on itself and the business environment.”

The role of service technologies, such as remote diagnostics and operation are central for operational and performance service concepts. Interview data describes the strategic motivation to aggressively develop new service offering and technologies. The capability to effectively develop new services and service technologies can be considered as a central component of manufacturer’s dynamic capabilities, when moving towards services-dominant business logics.

Leveraging existing resources

Leveraging existing resources refers to firm’s exploitation of its current resource-base in new products, market segments and customers (Prahalad & Hamel, 1990). Wernerfelt (1984: 174) stated that *“one should keep in mind that most resources can be used in several products. As a result, a given resource position barrier will often have consequences for several products, each yielding part of the resulting return.”* Prahalad and Hamel (1990: 80-82) continue that *“The real sources of advantage are to be found in management’s ability to consolidate corporatewide technologies and production skills into competencies that empower individual businesses to adapt quickly to changing opportunities...Competencies are the glue that binds the existing businesses. They are also the engine for new business development. Patterns of diversification and market entry may be guided by them, not just by the attractiveness of markets.”* Studied case firms expanded the utilization of their resource-base to other product categories. For instance technological capabilities were used in alternative products where similar competencies were possible to utilize.

Studied firms highlighted how they leveraged their technological resources into new products that enabled them to take responsibility of customer’s willingness to buy more comprehensive solutions:

“Expanding our new technology into demanding applications of high and complex buildings and enhancement of delivery processes have improved our possibilities to execute large projects.”

“Our R&D has focused on expanding our developed motor technology into new product segments and market areas.”

”Monospace provided an opportunity to gain savings in building and construction costs. It fitted globally and were not dependent on nationality. CEO’s vision was to a product portfolio based on the new technology.”

Case firms reported that they systematically leveraged their field personnel service know-how to cover new product categories demonstrating dynamic capabilities:

“During the last years we have improved our profits substantially because of our forward-looking solutions and innovative services. Accumulated competencies and experience are utilized now in material handling business.”

“Our new growth business is maintenance of automatic doors. This means more diverse services for our customers. We can utilize our existing service organization and competencies, and improve our competitiveness through the new growth.”

The case firms leveraged their existing resources such as patents, brands, manufacturing and technological assets, field personnel know-how and external assets in new product and business areas to facilitate planned change process towards services and total solutions. Findings indicate that reviewed firms leveraged their existing resources to achieve synergies by broadening their product-service scope for new integrated solutions, improved customer value, higher revenues and profits. The data suggest that leveraging the existing resources for new purposes require such exploitative capabilities, which are related to innovative capabilities. Stretching the existing resources for new purposes is a central component of manufacturer’s dynamic capabilities.

Reducing existing resources

Third mode of altering resources is reducing resources. A firm can reduce resources through joint-ventures with planned exits, reducing the number of suppliers, temporarily through layoffs or encouraging personnel to start their own businesses, hence transferring firm’s fixed costs to variable costs. Basically, reducing resources is a transitional period before releasing resources and deals with managers’ willingness to loose control of selected resources, yet not completely releasing the resources. Studied case firms reduced the number of component suppliers to better manage and evaluate their supplier network. Studied solution providers wanted to purchase more comprehensive solutions from their system suppliers and thus decreased purchases from smaller components suppliers that did not produce strategic components:

“In 2000 we continued to focus on our strategic competencies. Component production which wasn’t in the core of our strategy was transferred to strong business partners [system suppliers] and several production units were sold.”

“New CEO streamlined the firm’s financial control, follow-up and reporting. Departments had to focus on topical questions, future plans,

challenges, and expectations. He began a renewal program focusing on the company structure, organization and procedures.”

Releasing existing resources

Last mode of altering resources is releasing resources, which refers to made divestments, redundancies and outsourcings (Eisenhardt & Martin, 2000; Danneels, 2011). Studied firms moved also manufacturing abroad, not only because of tightened competition but also because of increased demand in developing countries. Especially manufacturing of standard products was moved to developing countries such as China and India. On the other hand, development of special products, special services (e.g., industrial internet) and coding remained in developed countries such as in Finland, Sweden, Germany or US. One case firm even moved its production from South-America to Finland to increase its competitiveness because it considered that created ecosystem in Finland enabled cost-efficiency and that production of highly demanding and complex products required close interaction with R&D and established supplier network. Finally, and quite obviously, all the studied firms outsourced their non-core businesses such as ICT-services, maintenance of real estates or some financial administration services to firms who were specialists in these business areas. Outsourcing trend started in 90's and it has continued to date. Following quotes indicate that studied manufacturers released their manufacturing resources to focus on more added value creating operations:

“We sold our operations in South-America to our main competitor. Sold businesses accounted for approximately 1% of our total revenues. Possibilities to grow our business were limited in South-America and our corporation decided to allocate our resources to other growing market areas.”

“In 2002 we started to divest businesses that were not our core businesses...In 2007 we developed our production structure in many ways. Production of tailored equipment was standardized and strategic components were transferred to more efficient unit in Finland. Production of one of our product category was moved to China, Great-Britain and USA. All the standardized products, on the other hand, will be manufactured in China in the future.”

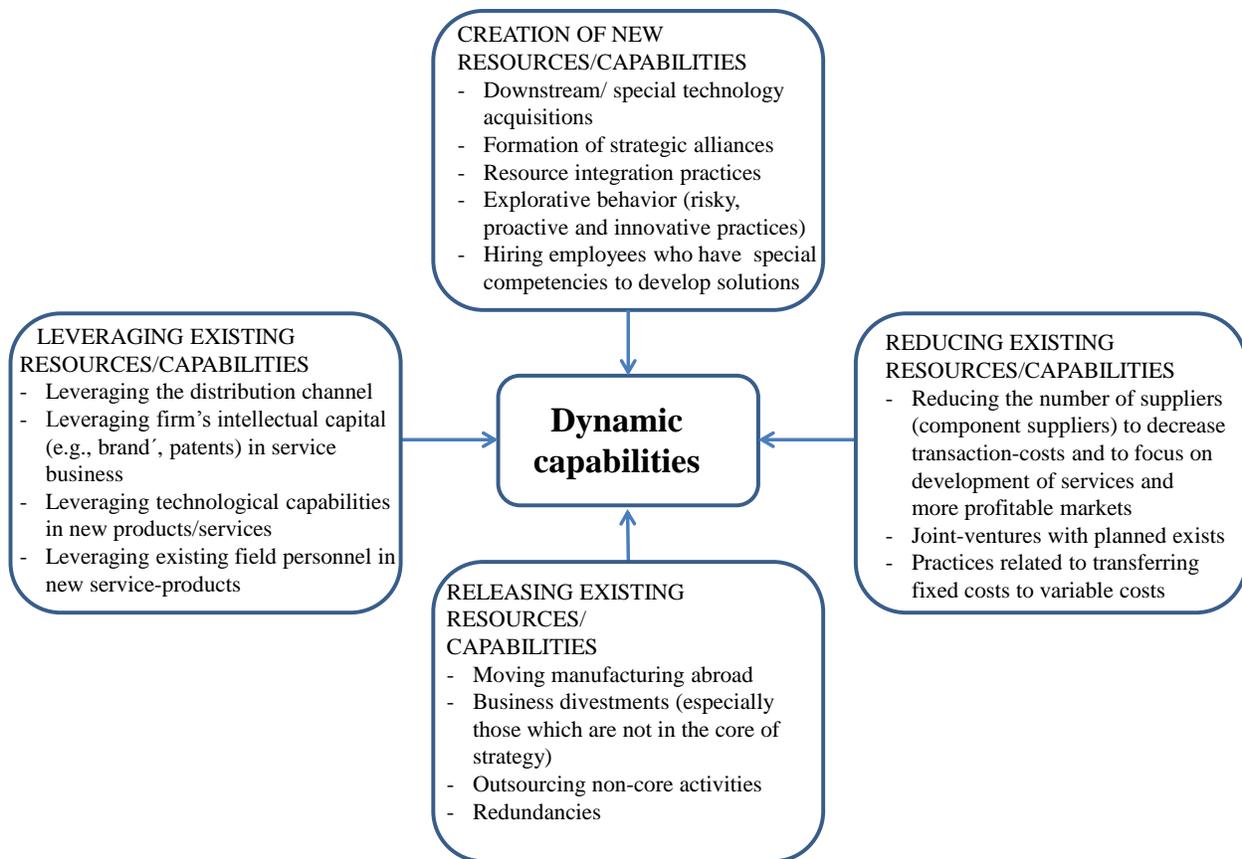


Figure 1. Summarizing the dynamic capabilities in servitization.

DISCUSSION AND IMPLICATIONS

Theoretical implications

This study was set out to analyze the dynamic capabilities needed for resource reconfiguration when a manufacturer is moving from product to service-dominant business logic. The present study extends the existing industrial service literature by analyzing 9 servitized manufacturers by application of the dynamic capability approach. This study provides insight into servitized manufacturing company's alteration of its resource-base and central means of doing that. Our results indicate that industrial solution providers who have successfully transitioned from products to solutions reconfigured their resource-base by the four main modes discussed below.

First, the studied firms demonstrated dynamic capabilities by creating new capabilities related to service technologies, service delivery processes, and product-service bundling. These are critical considering the difference to prior capabilities that were developed based on product-dominant business model. Services-dominant business model requires remote diagnostics, global service reach as well as effective product-service configuration in the solution sales phase. By reflecting the definition of dynamic capabilities as "*ability of a firm to renew itself in the face of a changing environment (Teece, Pisano, and Shuen, 1997) by changing its set of resources (Eisenhardt and Martin, 2000)*" (Danneels: 2010: 1), the present study analyzes how a

manufacturer creates new resources/capabilities, and leverages, reduces and releases its existing resources to configure for services-dominant business model.

Second, the firms developed processes for leveraging their resource base, such as patents, brands, databases and personnel know-how to broaden the scope of customer markets by adding new services and integrated solutions into their portfolio of offerings. Adding new services and providing integrated solutions seem to be a central strategy for reaching new customer segments that expect performance or operational services. Provision of operational services require product-service bundling, new pricing models, preventive maintenance, and effective service network. In particular, leveraging resources requires customer-linking capabilities and ability to expand corporate-wide competencies to find new product-service combinations for new customer segments.

Third, studied firms reduced the number of suppliers, especially component suppliers to facilitate change process. Adding new services into offering and provision of integrated solutions sets expectations for the effectiveness service supplier network. Dispersed supplier network of many small firms may decrease the adaptivity of the strategic supplier network and generate vast amount of transaction costs (Rindfleisch & Heide, 1997). Network coordination should be effective and thus simplified by adding service-system suppliers operating under the customer brand name. For service suppliers, effective market reach and ability to operate under the control and guidance of the solution provider is of importance. Network-type of supply system structure expects partnership development related processes and capabilities such as relationship-specific investments, relational structures and social capital with particular system suppliers (Dyer & Hatch, 2004).

Fourth, studied case firms released their non-core manufacturing and production assets to focus on downstream activities within the value system. To provide necessary focus and resources for the development of solutions provision, provision of integrated solutions, standardized and easier-to-outsource non-core manufacturing activities were outsourced. Outsourced activities were characterized by simplicity, little relationship-specific investments, and decreased need for adaptation. Coordination of these types of activities were considered effective enough for outsourcing. Vertical disintegration, increased outsourcing and concentration on firms' core competencies have enabled favorable preconditions for growth of services and integrated solutions.

Managerial implications

With regards to the managerial impact, our framework facilitates recognition of needed capability development activities, when moving from product-manufacturing towards services-dominant business models. The developed framework enables managers to review what particular resources it should reduce and release to focus on more valuable business activities. The model provides practical tool for managers to develop new resources enabling the firm to stay ahead of competition, differentiation from the competitors and create special value for its key stakeholders. Finally, the presented model facilitates managers' understanding how to leverage firm's existing resource-base in new customer and product-service markets.

Limitations and further research

As with any research, present study has limitations that should be considered. First of all, because our data are qualitative in nature, results cannot be generalized to the population. Future research could extend and test these results by different cases selected systematically. Selecting cases from generalizable quantitative dataset enable better database for the analysis of dynamic capabilities. Secondly, even though we interviewed senior managers from studied case firms and their system suppliers and strategic customers, and we collected and analyzed extensive secondary data from firms' annual reports, press releases/stock exchange releases, industry reports, histories and business magazine stories, our data lack evidence on firms' competitors' perceptions of investigated firms' resource reconfigurations effects. Future studies would greatly benefit from similar longitudinal and retrospective primary and secondary data collection processes from various industries. As we investigated dynamic capabilities in moderately changing and well-structured markets and prior studies have focused on studying dynamic capabilities especially in high-velocity, ambiguous and chaotic market conditions, future studies should put emphasis on studying how established firms in slowly changing markets alter their resources in the long-run and if the dynamic capabilities differ from the moderately changing markets.

Conclusions

Contributing to industrial service literature, by utilizing the dynamic capability approach, the present study reconfigures their resource-base by four main modes: 1) creating new resources/capabilities and 2) leveraging, 3) reducing and 4) releasing their existing resources/capabilities. This study provides a rich insight into solution provider's resource reconfiguration practices.

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