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Competing in business-to-business sectors through pay-per-use services

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Abstract

Purpose – Despite the opportunities provided by pay-per-use (PPU) services, product companies in business-to-business sectors often fail to compete systematically by using them. The purpose of this paper is to explain how companies can avoid failures when it comes to PPU services. The paper describes the “seizing” capabilities needed to achieve the strategic objectives of PPU services.

Design/methodology/approach – The research process is divided into a pilot and an in-depth study. Altogether, 17 companies participated in the study.

Findings – The findings reveal that the seizing capabilities depend on the strategic objectives of PPU services. To expand the market share with PPU services, companies need to broaden the customer portfolio for PPU services, to align individual services within the entire service portfolio and to balance profits made by PPU services and other business lines. For strategic objectives such as rapid sales growth early in the market development and new market creation other seizing capabilities are required.

Research limitations/implications – The findings are not generalizable, due to the use of a qualitative study. The study is restricted to product companies in the business-to-business sector.

Practical implications – Managers often believe that extending and modularizing the service portfolio is beneficial. When achieving sales growth during the market development phase, these capabilities are in fact sometimes counterproductive. Practitioners have to look into the costs and benefits of setting-up their own financing company and working with banks.

Social implications – PPU services contribute to a more sustainable consumption and make product design more resource-efficient.

Originality/value – The study is original by virtue of systematically studying PPU services, providing a microfoundation for seizing capabilities and developing testable propositions for future research.

Keywords Servitization, Dynamic capabilities, Business-to-business sector, Pay-per-use services, Product-service-systems, Seizing capabilities, Product companies

Paper type Research paper



1. Introduction

Newly emerging technologies (e.g. digitization, internet of things, industrial internet) and changing customer needs are altering the business environment in business-to-business sectors. Customer requirements increasingly go beyond operational needs and extend to

strategic needs for ensuring customer success. Product companies in the business-to-business sector respond to such changes in the business environment by shifting from products to services. This shift has been conceptualized in various ways, including servitization, transition from products to services, service infusion, (industrial) product-service-systems (PSS), functional sales, integrated product service offerings, service-led growth, and/or hybrid offerings (e.g. Baines *et al.*, 2009; Kowalkowski *et al.*, 2015; Oliva and Kallenberg, 2003; Mont, 2002; Ulaga and Reinartz, 2011).

The capability-view of sustaining competitive advantages suggests that companies can enhance competitive advantages in a specific business environment by developing operational capabilities into core competencies (Winter, 2003). Additionally, dynamic capabilities such as sensing opportunities and threats, seizing to take advantage of the sensed opportunities and fending off threats, and reconfiguring for maintaining competitiveness by modifying operational capabilities, enable companies to respond to changes in the business environment (Teece, 2007).

Companies sense both the opportunities and threats associated with pay-per-use (PPU) services. They recognize the opportunity that customers only have to pay for the use of a product without buying the product itself. Companies also acknowledge the threat that customers with a low level of product usage are attracted by PPU services (Cusumano *et al.*, 2015; Guajardo *et al.*, 2012), making it difficult to explore fully the financial opportunities. Companies seize the sensed opportunities and fend off these threats through adapting the revenue mechanism from product revenue to payment for product usage (Kindström *et al.*, 2013). Companies also reconfigure operational capabilities by developing new data processing capabilities to gain a deeper understanding of product usage and by altering product design capabilities to optimize service delivery costs, as well as PPU revenue throughout the product lifecycle (Ulaga and Reinartz, 2011).

Nevertheless, companies struggle with PPU services. The tire manufacturer, Michelin, recognized that its premium product quality and lifecycle cost advantages would allow very competitive prices per kilometer (pay-per-kilometer) a tire runs. Michelin reconfigured its sales competences to sell pay-per-kilometer services, but struggled for many years to become commercially successful. Michelin's pay-per-kilometer services became first successful, when Michelin's seizing capabilities enabled setting up an independent strategic business (Michelin Solution), embedding technology options to monitor the tire wear put, and re-designing these pay-per-kilometer services into a specialized PPU solution (Ulaga *et al.*, 2013).

Against this background, this paper focuses on the seizing capabilities for PPU services, so as to extend the existing research in four ways. First, PPU services are generally assumed to enhance sustainability. Research has systematically studied how PPU services encourage sensible consumption and lead to product designs which maximize resource efficiency (Sundin and Bras, 2005). PPU services are regarded as incentivizing resource-efficient product usage (Bocken *et al.*, 2014; Manzini and Vezzoli, 2003; Williams, 2007). The study highlights how PPU services contribute to achieving strategic corporate objectives (e.g. sales growth, market share, profitability), since there is a lack systematic evidence (Cusumano *et al.*, 2015).

Second, research acknowledges the importance of so-called seizing capabilities, but these seizing capabilities often remain a black box (e.g. Helfat and Peteraf, 2015). Thus, the study provides a microfoundation for seizing capabilities. Third, previous studies consider PPU services as one service option, through extending the service portfolio (e.g. Baines *et al.*, 2009; Davies, 2004). Seizing capabilities are, therefore, not dedicated to PPU services, but rather more generally to the entire service offering (Kindström *et al.*, 2013).

Fourth and finally, prior research has rarely provided propositions that can be tested. Since the present qualitative research covers a broad range of industries, countries, and

company sizes, which affect the way firms deploy PPU services, testable propositions related to the issues under investigation are developed.

The paper is organized as follows. The literature review section starts with a description of PPU services and then summarizes the previous literature on seizing capabilities. Afterwards, the methodology, and then the research results are described. The paper concludes by providing research and managerial implications.

2. Theoretical background

2.1 Definition of PPU services

PPU services are a popular management phrase in the software industry. Software companies lock-in customers with usage fees for the software features customers are actually using rather than demanding up-front payments (Weinhardt *et al.*, 2009). PPU services are frequently used in the business-to-consumer sector as an alternative to subscription services (e.g. pay-per-view by Sky, pay for car insurance on a per-mile basis by MetroMile, pay-per-copy by Xerox, or pay-per-wash by Electrolux).

Additionally, product companies in the business-to-business sector started to utilize PPU services (pay-per-service unit). Through PPU services, product companies give customers access to products they desire. Instead of purchasing the products, companies allow customers to pay only for usage (e.g. Helander and Möller, 2007; Windahl and Lakemond, 2010). Product usage can be measured through various indicators (e.g. operational hours, such as Rolls-Royce's power-by-the-hour concept, the kilometer as in Michelin's pay-per-kilometer solution, and usage of software features as by Salesforce).

PPU services are similar to notions such as substituting services, outcome-based services, and result-oriented PSS. Result-oriented PSS (pay-per-service unit) suggests that the user no longer buys the product and thus pays only for the level of product usage (Tukker, 2004). Product companies are responsible for all service activities that are needed to ensure product usage (i.e. product, spare parts maintenance, repair and replacements when appropriate) (Helander and Möller, 2007; Lay *et al.*, 2010). PPU services are also similar to substituting services, which contend that customers do not purchase a product with services, but rather a service instead of the product (Cusumano *et al.*, 2015). Outcome-based services focus on achieving required outcomes rather than a contract for the supply of a set of specified products. Customers purchase the result of the product used (product usage or performance outcomes) and not its ownership (Ng and Nudurupati, 2010).

2.2 Benefits of PPU services

PPU services constitute a beneficial pricing mechanism (e.g. Fishburn and Odlyzko, 1999), and as an advanced service that can lead to new competitive advantages (Baines and Lightfoot, 2013). PPU services encourage sensible consumption and lead to product designs maximizing resource efficiency in product usage (e.g. Bocken *et al.*, 2014). Competitive advantages arise from offering customers a usage fee, rather than letting them purchase the product, and from converting low lifecycle costs into competitive usage fees (Cusumano *et al.*, 2015). More specifically, PPU services provide better opportunities for product remanufacturing, since it is easier to retrieve used products by controlling the product usage than by selling the products (Sundin and Bras, 2005). These services lead to more preventive maintenance activities, which is of course preferable to relying on emergency services in cases of breakdowns. This means that products last longer and are more easily remanufactured, which can lead to selling the same products several times during their economic lifecycle (Sundin *et al.*, 2009). For example, photocopier companies let customers pay-per-copy and later remanufacture (refurbish) copy machines and place them in new offerings (e.g. new PPU services, used-product business, rental and leasing services).

Companies consider PPU services as a way to expand market shares, especially when product markets become mature (Cusumano *et al.*, 2015). PPU services enable companies to expand demand through tapping into customer segments, which have a too low product usage to justify buying the products. In such situations, companies take advantage of PPU services, leading to selling products several times during its economic lifecycle (Sundin *et al.*, 2009).

Under the condition that customer preferences are still in a state of flux, PPU services lower barriers for customers to use the products. Besides these opportunities, companies cope with the threat that amortizing product costs takes longer through PPU revenues, as opposed to than selling the product directly. In addition, uncertainty about maintenance costs can threaten the profitability of PPU services (Cusumano *et al.*, 2015).

2.3 Seizing as a dynamic capability

Research either derives seizing capabilities from general capability discussions or discusses seizing capabilities explicitly as a dynamic capability (see Table I).

2.3.1 Seizing capabilities deriving from general capability descriptions. Seizing capabilities derive from the discussion about the scope of products and service offering (Raddats *et al.*, 2015; Tuli *et al.*, 2007), as well as defining the most suitable business model (Kindström, 2010; Mont *et al.*, 2006), and then taking advantage of investments in new service opportunities. Seizing capabilities align product and service strategies (Davies, 2004) combining cost leadership and/or product differentiation with different types of service offerings (Helander and Möller, 2007; Matthyssens and Vandenbempt, 2010). Companies match customer segments with different service offerings and value propositions (Storbacka, 2011), allocating profits earned from basic services (e.g. spare parts, field services) to finance further service business extension (Cohen *et al.*, 2006). Defining the boundary of the product company is also a seizing capability (Kohtamäki *et al.*, 2013), since it directs the development partnerships with suppliers (Baines and Lightfoot, 2013), customers, and their customers' networks (Alghisi and Saccani, 2015), as well as service integrators and/or distributors (Finne *et al.*, 2013).

2.3.2 Seizing as a dynamic capability. Three studies focus on seizing capabilities more specifically. In the context of service innovation in product companies, Kindström *et al.* (2013) offer a microfoundation for seizing capabilities. Seizing capabilities describe service interactions, managing the service delivery process, structuring the service development process, and adopting new revenue mechanisms. Furthermore, seizing capabilities depend on whether a company develops the service business as an incremental improvement (exploitation) or a radical jump toward new value constellation (exploration). The former requires, for example, seizing capabilities for formulating "planned strategies" for service business development. The latter requires seizing capabilities in terms of visioning new value opportunities, taking risks, and formulating umbrella strategies, which enable numerous new value constellation scenarios to emerge (Fischer *et al.*, 2010).

Similarly, Gebauer *et al.* (2012) argued that seizing capabilities depend on the paths for the service business development: enhancing relational value for existing supplier-buyer relationships, financial value-seeking behavior in supplier-buyer relationships, and a radical leap toward a new value constellation downstream in the value chain. For example, enhancing relational value requires seizing capabilities such as balancing costs for services to augment the product offerings and improvements in the quality of supplier-buyer relationship with a product price premium (see Table I).

3. Research methodology

Given the research objectives, a qualitative research method was employed in this study. The research methodology followed a sequence of iterations, switching sequentially

Authors	Seizing capabilities and strategic approaches	Descriptions
<i>Seizing as a dynamic capability</i>		
Raddats <i>et al.</i> (2015), and Tuli <i>et al.</i> (2007)	Defining the scope of products and service offerings	Defining the individual products and services as well as the entire product and service portfolio Positioning services along the sales phases (pre-sales, sales, and after-sales phases) Positioning in relation to the actual product (services supporting the product, services supporting the customers) Describing customer support throughout the product lifecycle
Kindström (2010), and Mont <i>et al.</i> (2006)	Defining service-oriented business models	Identifying and selecting most suitable business models for the services Managing the relationship between product- and service-oriented business models
Davies (2004), and Helander and Möller (2007)	Aligning products and service strategies	Defining product strategies (cost leadership, differentiation, etc.) Defining service strategies (performance enablers, system provider, development partner, etc.) Matching service strategies with service offerings
Cohen <i>et al.</i> (2006)	Financing service business extension	Exploiting high margins in the business concerning the basic services (spare parts, field services) Utilizing these margins for financing the development, sales, and delivery of advanced services
Storbacka (2011)	Matching customer segments with service offerings Defining the boundary of the firm	Identifying customer requirements and customer segments for services Describing the value proposition for the service offerings Combining service offerings and customer segments Specifying the internal and external competences needed to develop, sell, and deliver services Identifying external partners possessing the competences Developing collaborations with these partners (e.g. customers, suppliers, service integrators, and distributors)
Kindström <i>et al.</i> (2013)	Seizing capabilities	Service interactions: being conscious about customers' entire business processes, including those of the customers' own customers Managing service delivery processes: delivering certain services and interacting with customers Structuring the service development process: formalized new service development processes along the design, analysis, development, and launch stages Adapting new revenue mechanisms: mechanisms to increase service revenues such as dynamic pricings, profit sharing, and availability agreements
Fischer <i>et al.</i> (2010)	Approaches for service business development Exploitation	Phase 1: integrating basic services into the product price Forming a dominant design (tactical choices on bundling and charging goods and services) Phase 2: separating product and service business to extend service profit and revenue Commercializing services that were originally included in the product prices Create a distinct service business (business manager qualities) Phase 3: making use of the service expansion along the primary customer activity chain

Table I.
Overview on seizing capabilities

(continued)

Authors	Seizing capabilities and strategic approaches	Descriptions
	Exploration	<p>Satisfying customers' expressed needs</p> <p>Formulating "planned strategies"</p> <p>Articulating intended strategies</p> <p>Responding to customer needs and competitors' service offerings</p> <p>Phase 1: integrating basic services into the product price</p> <p>Forming a dominant design (tactical choices on bundling and charging goods and services)</p> <p>Phase 2: creating a new value constellation</p> <p>Visioning new value opportunities</p> <p>Articulating "umbrella strategies" for the new value constellations</p> <p>Allowing various scenarios to emerge</p> <p>Exploring a broad range of different business opportunities</p> <p>Phase 3: making use of the service expansion along the adjacent customer activity chain</p> <p>Supporting customers' primary and adjacent activity chains</p> <p>Stabilizing the new value constellation</p> <p>Involving rigid scenario planning</p> <p>Respond to customer needs and competitors' offerings</p>
Gebauer <i>et al.</i> (2012)	<p>Paths for the service business development</p> <p>Enhancing relational value for the existing supplier-buyer relationships</p> <p>Financial value-seeking behavior in supplier-buyer relationships</p> <p>Radical leap toward a new value constellation downstream in the value chain</p>	<p>Balancing costs for services to augment the product offerings and improvement in the quality of supplier-buyer relationship with the product price premium</p> <p>Assessing customers' perception of their service needs</p> <p>Translating customer's perception into value-based prices for each service</p> <p>Verifying the sensed financial benefits</p> <p>Considering value propositions across various utility layers</p> <p>Defining the boundaries of the strategic response and new value constellations</p> <p>Allowing various scenarios of value constellations and propositions to emerge</p> <p>Anticipating how each scenario affects value creation logics</p> <p>Mobilizing other network players</p> <p>Visioning a value network, which is most suitable to form a new value constellation</p>

Table I.

between empirical results and theoretical inputs, and thus generated the seizing capabilities. The nature of the research process was abductive, that is, combining induction and deduction (Dubois and Gadde, 2002). The research process is divided into a pilot and an in-depth study. The pilot study reveals the descriptions and strategic objectives of PPU services. The seizing capabilities necessary for achieving these strategic objectives for PPU services are, instead, analyzed in the in-depth study.

3.1 Pilot study

A purposeful sampling process was used for the pilot study (Yin, 1994), screening industry reports and talking to industry experts. 21 companies were contacted, of which 17 agreed to participate in the pilot study. To ensure external validity, these participating companies embrace a variety of industries and products, company sizes and geographical locations (see Table II). All companies rely increasingly on services to achieve competitive advantages and all offer PPU services.

Industry and products	Country and size	Interviews pilot phase	Interviewees in-depth case studies
Compressor manufacturer	Germany, 5,000 employees	Sales manager	
Battery manufacturer	Sweden, 130 employees	Head of sales	
Cleaning equipment	Switzerland, 180 employees	CEO	Head of sales, key account managers, head of service business, CEO
Water treatment equipment	Switzerland, 10 employees	CEO	CEO, local sales representative, sales manager
Solar system manufacturers	Germany, 25 employees	COO	CEO, COO, service manager
Wind power generation	Germany, 70 employees	Key account manager	
Aircraft engines	UK, 50,500 employees	Service manager	
Copying and printing machines	Germany, 40,000 employees	Head of service business	
Heavy construction equipment	Germany, 105,000 employees	Spare parts and distribution manager	Spare parts and distribution manager, key account manager (3), business development (3)
Waste water treatment equipment	Switzerland, 25 employees	CEO	
Drilling machines	Liechtenstein, 23,000 employees	Head of sales and marketing	Head of sales and marketing, innovation manager
Tire manufacturer	France, 113,000 employees	COO	
Pump manufacturer	Denmark, 19,000 employees	Key account manager	
Solar panel manufacturer	Germany, 3,800 employees	Key account manager	
Forklift trucks	Germany, 14,000 employees	Key account manager	Key account manager (3), innovation manager, sales and service manager (3)
Medical equipment	Germany, 2,900 employees	Head of service business	
Construction equipment	Germany, 7,800 employees	CEO	

Note: In case more than one interview was conducted, the number is given in parenthesis

Table II.
Sample characteristics
(pilot and in-depth
case studies)

Semi-structured interviews were carried out with managers within each of the 17 companies. Over six months, the research team personally met with these managers, who were asked questions about the service offerings. Follow-up questions were used to explore key strategic objectives pertaining to their PPU services. All interviews were recorded and transcribed. The interview data were supplemented with secondary data, such as company documents, which were an important source of information regarding PPU services. These documents and/or the interviews were summarized into a description of the PPU services. The research team reviewed these descriptions jointly to identify emerging themes and specific issues raised by the managers. Each pilot case was analyzed individually, before comparing them (Eisenhardt, 1989). From these initial analyses, it became clear that PPU services have different strategic objectives and can play minor or major roles in the service portfolio. The analysis led to themes about patterns among strategic objectives and the role of PPU services.

Thus, a pattern-matching technique (Yin, 1994) was adapted to ensure both internal and external validity. The research team placed pairs of descriptions on strategic objectives and

role of PPU services beside each other, examined them, and decided whether or not the two are similar. Two criteria were used to evaluate the similarities and differences between the two cases, namely, the degree of similarity in the overall description of the PPU services, and strategic objectives associated with the PPU services. Pilot case studies showing strong similarities were classified into three specific strategic objectives. Accordingly, an in-depth study was developed for the second stage. This in-depth study aimed at systematically identifying the seizing capabilities that managers consider essential for successfully achieving each of these strategic objectives.

3.2 *The in-depth study*

For each strategic objective, the research team decided to use essentially polar-type case studies (Eisenhardt, 1989). Among the 17 companies that achieved the expected strategic objectives and those that struggled to do so were identified. Through such polar-type case studies, it was determined which seizing capabilities contribute to achieving the strategic objectives of PPU services.

Multiple, semi-structured, interviews were conducted for each in-depth case study. Interviewees held positions such as head of sales and marketing, sales managers, key account managers, head of service business, service managers, chief operations officer (COO) and/or chief executive officers (CEO). Altogether, 26 executives were interviewed (i.e. between two and seven in each case study). The interviews covered the objective, seizing capabilities, as well as how seizing capabilities contribute to achieving the strategic objectives. Similar questions to those of the “narrative” approach (Yin, 1994), were used to explore key issues. At the end of each interview, the participant was asked for additional comments. All questions were phrased in an unobtrusive and non-directive manner, so as to avoid the pitfalls of excessively active listening (McCracken, 1988). Insights into seizing capabilities were obtained, based on the interviewees’ own language and/or case study transcripts, rather than using only pre-defined constructs.

To ensure reliability and validity, these primary data were triangulated with secondary information (e.g. company literature, internal documents) describing the PPU services. All primary and secondary data were used to develop case studies for PPU services. The participants reviewed the case study reports to ensure internal validity and reliability. The reviews motivated participants to provide more detailed information.

A content analysis to analyze these cases was used, by means of open, axial, and selective coding, beginning by undertaking open coding, paragraph by paragraph, to identify the capabilities in the case studies. Independent researchers conducted the coding. Interjudge reliability was assessed according to Perreault and Leigh’s (1989) index of reliability, which reached 0.84, well above the 0.7 threshold recommended for exploratory research (Rust and Coil, 1994). Any insights into seizing capabilities that emerged during the analysis were transcribed in the margins and then labeled with descriptive codes (Strauss and Corbin, 1998). A preliminary coding plan that listed the identified capabilities was developed. The research team provided a label and definition for each construct, specified the respective properties of each construct, and gave an example to illustrate its meaning and content.

To decide whether or not to include seizing capabilities, three key criteria were used: construct is applicable beyond the context of one firm, the construct explains differences in achieving the strategic objectives, and the construct advances theory-building. Overall, the analysis of in-depth case studies did not proceed through a linear process. The process was mainly abductive and interpretive, since new theoretical backgrounds were used, so as to achieve a better understanding of seizing capabilities for PPU services (Dubois and Gadde, 2002).

4. Results

4.1 Strategic objectives for PPU services

The pattern-matching technique in the pilot study yields three distinct strategic objectives of PPU services. Distinct means that the cases target only one of these three strategic objectives rather, than multiple ones simultaneously. Each case can be attributed to one of these three strategic objectives.

First, six cases have the strategic objective that PPU services accelerate sales growth rapidly in the process of market development. These six companies have recently developed new products, which they are introducing into new markets. They also operate in newly emerging industries, with high levels of uncertainty when it comes to cost and customer preferences. These companies want to reduce the barriers for customers interested in the new products. They innovate PPU services and integrate them as one option into the entire service offering. This integration can lead either to PPU services dominating the service offering or becoming one option in the service offerings. Overall, what these six cases have in common is that they utilize PPU services for achieving sales growth quickly. Rapid sales growth would reduce product costs through more frequent learning processes in product manufacturing. Such cost reductions enable these case companies to outpace competitors. This strategic objective is referred to as PPU for rapid sales growth in the market development.

Second, in seven cases, we observed that PPU services aim strategically at expanding and/or protecting market shares. These cases have reached the maturity phase of their product lifecycles. As the markets become mature, price competition and commoditization tendencies increase (Kotler, 2003). Thus, it becomes increasingly challenging to sustain product-based competitive advantages, so that, these companies extended the service portfolio through a stepwise shift toward services (e.g. Neu and Brown, 2005; Oliva and Kallenberg, 2003; Vandermerwe and Rada, 1988). PPU services are one step in this shift and are one option within the service portfolio. They strengthen the market position of these cases in two ways. On the one hand, PPU services can reach new customer segments, in which customers have some need for the product, but whose product usage is not high enough to justify purchase (Cusumano *et al.*, 2015). On the other hand, PPU services are valuable when companies have difficulties maintaining their price premium. However, a price premium is justified, because product quality is still superior, leading to lower product lifecycle costs. Companies convert lower lifecycle costs into price advantages for PPU services. This objective is referred to as PPU services for market share expansion.

Third, four cases reported having the strategic objective to utilize PPU services as a strategic innovation for creating a new market (Christensen *et al.*, 2002). These cases have also reached the maturity phase in their product lifecycle, but instead of strengthening competitive advantages in mature markets, the strategic objective is to open up new market spaces and create leaps in customer value (Kim and Mauborgne, 1999). PPU services are not considered as an option in the service offering, but rather become part of new solutions (e.g. fleet and asset management solutions). As a part of such a new solution, PPU services enable new business models, which supplement the existing models of selling products and services (Ulaga and Reinartz, 2011). PPU services create a new market, while at the same time, these case companies remain in the existing market. This strategic objective is referred to as PPU services for new market creation.

Altogether, the pilot study reveals sales growth, market share expansion, and new market creation as distinct strategic objectives (see Table III). The cases do not aim to achieve several objectives simultaneously, but rather focus on just one. Achieving each of these objectives requires a certain set of seizing capabilities, which in turn would inform the microfoundation of seizing capabilities.

Industry and products	Strategic objectives	Key results from the pilot phase
Battery manufacturer	Rapid sales growth in the market development	Selling the battery usage in terms of renting batteries to customers and letting customer pay for battery charging cycles. Such PPU service facilitates the market development for batteries and aim for quick sales growth. Pricing is based either on charging or electricity consumption
Water treatment equipment	Rapid sales growth in the market development	Selling the cubic meter of water attracts customers by allowing them to use the product without having to purchase it. Customer attraction facilitates sales growth and market development for innovative water treatment technologies. Customers can buy packages of 500 or 1,000 cubic meter water. Once the packages come to the end, they can buy new packages
Solar home system manufacturers	Rapid sales growth in the market development	Customers do not have to purchase the solar home systems, but just pay for every kilowatt hours these panels produce. Without up-front investments, paying-for-kilowatt hours accelerate market penetration in the early solar industry lifecycle. There is a fix price per kilowatt-hour, but if customers consume less than an agreed electricity level, they have to pay base fee
Wind power generation	Rapid sales growth in the market development	Wind power generation requires huge investments and uncertain maintenance costs. The company sells the megawatt hours rather than the wind power generation equipment. This accelerated the market penetration in the early industry lifecycle. There is a fix price per megawatt-hour, but if customers consume less than an agreed electricity level, they have to pay base fee
Waste water treatment equipment	Rapid sales growth in the market development	Pay-per-cubic meter of treated water is used to attract new customers. Customers try out the equipment and facilitate sales growth in the market development. Payment depends on whether the agreed water quality is achieved or not. Prices per cubic meter depend on the severity of the level of water contamination
Solar panel manufacturer	Rapid sales growth in the market development	Selling the kilowatt hours to accelerate rapid sales growth early in the market development. Without up-front investments, paying-for-kilowatt hours accelerate market penetration in the early solar industry lifecycle. In addition to paying for the electricity consumed, customers pay a basic fee
Compressor manufacturer	Market share expansion	Selling PPU services (cubic meter packages) to customers who think that the products are too expensive. PPU services help to gain market shares back from competitors. Customers can either buy packages of 500 or 1,000 cubic meter of compressed air and/or pricing is done on the electricity used to compress the air. Once the packages come to the end, they can buy new packages
Cleaning equipment	Market share expansion	Selling the hours the cleaning equipment is running as well as the efficiency in the usage of the cleaning material. PPU services create competitive advantages, which are converted into a market share expansion
Aircraft engines	Market share expansion	Selling the hour the aircraft engines is running as well as performance agreements on the fuel efficiency. Such PPU and pay-per-performance services led to market share expansion
Heavy construction equipment	Market share expansion	PPU services are bundled into service packages with a pre-defined number of usage hours. These services target customers, who do not want to pay a price premium, leading to a market share expansion. Usage hours are predicted together with the customers. If customers use the construction equipment less than predicted, prices are increases
Pump manufacturer	Market share expansion	Pay-per-cubic meter of pumped water is offered to customers who have difficulties in accepting the price premium of the pump manufacturers. Better lifecycle costs are converted into price advantages for the pay-per-cubic meter fee. Pay-per-cubic meter strengthen the market position

(continued)

Table III.
Strategic objectives of
the PPU services

Industry and products	Strategic objectives	Key results from the pilot phase
Medical equipment	Market share expansion	Pay-per-medical image allow customers only to pay for the medical images taken by the equipment instead of purchasing it. Medical equipment is shared by various customers, who access the equipment and just pay for the usage. This offering aims for expanding the market share
Construction equipment	Market share expansion	PPU services are bundled into service packages with a pre-defined number of usage hours. Target customers, which do not want to pay a price premium. Usage hours are predicted together with the customers. If customers use the construction equipment less than predicted, prices are increases
Copying and printing machines	New market creation	PPU services are vehicle for an annuity-based business model based on recurring revenues. Besides pay per copy and/or printed page, this new business model created a new market for bundles of solution of contracted services, equipment maintenance, consumable supplies, and financing
Drilling machines	New market creation	PPU is embedded into fleet management services. The company takes over the entire fleet of the customers including third-party products. A new market for fleet management emerged. Customers pay a fleet management fee. As a side effect, own machines are stepwise replacing competitor machines leading to fleets which are to nearly 100% owned by the company. This side effect strengthens the new value constellation for the emerging market for fleet management
Tire manufacturer	New market creation	Selling the kilometer the tire is running is embedded in asset management service. The company actively manages all tires of the customers (e.g. maintenance, repair, refurbishment, air control, pumping). This solution creates a new value constellation for the price per kilometer rather than the quality and prices for tires. Kilometer prices depend on the various customer characteristics.
Forklift trucks	New market generation	Pay-per-hour is embedded into a flexible pricing and fleet management offering. It creates a new value constellation in which this company enables customers to pay only the usage (e.g. hour, ton transported, kilometer driven). The new value constellation makes the customer's cost structure completely flexible and aligned with its own workload

Table III.

4.2 Seizing capabilities

Considering the polar-type case studies, the evidence from cases achieving the three strategic objectives was compared with those struggling to achieve them. By considering the three criteria (e.g. applicability beyond the context of one firm, contributing to achieving the strategic objectives, and advancing theory-building), the data reveal the microfoundation for seizing capabilities. Table IV summarizes the identified seizing capabilities.

4.2.1 Rapid sales growth in the market development. The comparison of ALPHA achieving the strategic objective and BETA struggling to do so reveals four critical seizing capabilities: defining the service portfolio, financing PPU services, investing in enabling technologies, and customer support.

Defining the service portfolio. ALPHA made PPU services the dominant service offering, replacing alternative options such as selling, renting and leasing of products. Instead, BETA simultaneously sells products and basic services as well as renting, leasing, and PPU services. The rationale was to have flexible service offerings, which match various customer segments (Storbacka, 2011). As BETA's sales manager argued: "[...] we did not offer only pay-per-use services. We wanted to be flexible to cover different types of customers [...]." BETA even modularized the PPU services. The sales manager continues "[...] modularizing PPU services is beneficial. Thus, we offered three pay-per-use packages [...] Later, we

Case companies	Sales growth		Strategic objectives		New market creation	
	ALPHA	BETA	GAMMA	DELTA	IOTA	KAPPA
Successful sales growth	Struggling to achieve sales growth	Struggling to achieve sales growth	Successful market share expansion	Struggling to expand the market shares	Creating successfully a new market	Struggling to create a new market
Comparison of seizing capabilities	<p>Focusing only on PPU services in the total offering</p> <p>Partnering with financial institutions to transfer product ownership</p> <p>Investing in enabling technologies</p> <p>Introducing remote monitoring to reduce service costs</p> <p>Implementing self-service technologies to assist customers in the product operation and maintenance</p> <p>Data processing and analytics to better predict service costs and create new product generations</p> <p>Developing consulting services for supporting the entire customer business</p> <p>Charging separately for customer support services</p>	<p>Offering multiple services</p> <p>Keeping the product ownership in the company and neglect the collaboration with finance partners</p> <p>Investing partly in enabling technologies</p> <p>Delaying introduction of remote monitoring</p> <p>Implementing self-service technologies to assist customers in the product operation and maintenance</p> <p>Lack of data processing and analytics to better predict service costs</p> <p>Keeping existing product generations</p> <p>Developing consulting services for supporting the entire customer business</p> <p>Integrating customer support services into the PPU service fee</p>	<p>Broadening the customer portfolio for PPU services</p> <p>Including customers with low-level usage and customers not accepting product price premiums</p> <p>Risk mitigation across individual customers</p> <p>Aligning individual services within the entire service portfolio</p> <p>Balancing PPU services and used-product business</p> <p>Dynamic pricing mechanism</p> <p>Modifying incentive systems to support different services</p>	<p>Narrowing down the customer portfolio and segments for PPU services</p> <p>Focusing on customers not accepting the product price premium</p> <p>Keeping services as an individual offering</p> <p>Favoring used-product business</p> <p>Static pricing mechanisms</p> <p>Keeping a similar incentive system for all services</p>	<p>Visionary view of the opportunities</p> <p>Defining service portfolio through trial-and-error processes</p> <p>Retaining temporal rather than structural ambidexterity between existing and new markets</p> <p>Modify partnerships with existing suppliers</p> <p>Collaborating with new supplementary firms</p>	<p>Limited view of the opportunities</p> <p>Freezing service offering quickly</p> <p>Encouraging structural ambidexterity between existing and new markets</p> <p>Keeping partnerships with existing suppliers</p> <p>Continue collaboration with existing customers</p>

Table IV. Seizing capabilities for the strategic objectives

learned that our entire service offering, and [...] these packages are too complex [...] slowing down our growth.” Complexity may thus outweigh the benefits of flexibility and modularization, as emphasized in the literature (Cohen *et al.*, 2006; Kowalkowski *et al.*, 2015). Customers were confused about the variety of offerings, and sales people found it difficult to match the offering with individual customer needs. However, ALPHA reports just the opposite. As one manager explained: “[...] focusing on a single pay-per-use service really helped us to streamline our processes [...] achieving cost targets while maintaining service quality.”

Financing PPU services. To maintain profit targets when offering PPU services (Ulaga and Reinartz, 2011), both case companies transfer ownership to financial partners as well as the payments for usage. The partner pays the full product price directly to ALPHA and/or BETA, along with a monthly fee for product maintenance. The partners then receive the payments made by the customers for product usage. While ALPHA succeeded, BETA actually considered the financing fee as too high. BETA favored using internal financial resources, but this slowed down the growth considerably. BETA’s operation manager suggested that the slower growth rate had an unanticipated effect: “[...] since we could only sell 12, instead of 30 products per month, our cost improvement was much lower [...]” In contrast, ALPHA benefited from stronger growth, leading to faster cost improvements in the product manufacturing.

Investing in enabling technologies. Besides the innovative product technologies, both cases decided strategically whether they would embed remote monitoring systems, self-service technologies, data processing, and analytics into the PPU services (Ulaga and Reinartz, 2011; Vandermerwe and Rada, 1988). ALPHA invested in systems for tracking product usage. However, such systems doubled product costs, but enabled ALPHA to solve product failures remotely, thereby reducing service costs. Remote systems make it easier to cope with the uncertainty associated with service costs, because they allow ALPHA to gain a clear understanding of how product usage influences these costs. By contrast, BETA delayed such investments. As BETA’s CEO stated: “[...] of course, we recognized the opportunities of remote monitoring systems. However, our team was still improving our product technologies. [...] remote monitoring was second priority [...]”

Such systems are necessary, because neither case has historical data about the actual service costs. The products are new and service-cost estimations are not available. Supported by remote monitoring systems, ALPHA experimented with various parameters (e.g. product components, component durability, and service intervals), so as to gain information about the actual service costs. BETA did not experiment actively with these parameters. Through this experimentation, ALPHA developed five new product generations with decreasing servicing costs, whereas BETA’s high service costs continued jeopardizing the financial viability of BETA’s pay-per-service contracts.

Both cases strengthen the customer ability to operate the product in a cost-efficient way, by investing in self-service technologies. Such technologies guide customers in performing regular maintenance activities, triggering the transfer of maintenance activities to the customers, thus reducing the servicing costs still further.

Customer support. These technologies create valuable information about customer needs. Such information suggests that customer product usage not only depends on how well customers operate and maintain the product, but also on how they manage their business in general (Tuli *et al.*, 2007). In order to strengthen business competences of their customers, both cases provide consulting services. ALPHA did not include consulting services in the price of PPU services. As ALPHA’s CEO stated: “[...] we should charge for these services separately, because they have high customer value [...]” BETA provided such services free of charge. BETA’s CEO explained that “[...] consulting services should be

for free, because they augment our offering. Our customers [...] will not pay for additional services [...].” In contrast, ALPHA argued that “[...] once customers operate the equipment, they make money. Customers are willing to [...] pay for consulting services [...] because they help customers to expand their business [...].” Whether companies charge or do not charge influences achieving the strategic objectives (Witell and Löfgren, 2013). For BETA, the costs of delivering such services increase PPU fees accordingly. Because of higher prices, customers switched to competitors. Customers did not consider that the consulting support justifies such higher prices, because they were unsure whether they would actually need them. Considering these and other statements, it is proposed that:

- P1.* Rapid sales growth, as a strategic objective for PPU services, will be more likely if seizing capabilities entail: (a) focusing only on PPU services, (b) partnering with financial institutions, (c) investing in enabling technologies (e.g. remote monitoring systems, self-service technologies, data processing, and analytics), (d) charging separately for customer support services, and (e) investing in reverse logistics and remanufacturing to achieve improved resource efficiency.

4.2.2 Market share expansion. Again, comparing the high (GAMMA) and low-performing (DELTA) cases suggests the following seizing capabilities for market share expansion: managing customer portfolios for PPU services, aligning the individual service offerings, and balancing profits made by PPU services and other businesses. These seizing capabilities are a response to competitors’ aggressive product pricing strategies. GAMMA’s and DELTA’s products have superior lifecycle costs. Some customers only noted that the products are more expensive than those of competitors, and failed to see the cost advantages over the whole product lifecycle.

Managing the customer portfolio. Both case companies define a customer portfolio for PPU services (Tuli *et al.*, 2007). GAMMA’s manager stated: “[...] There is a segment with a relatively low usage level. [...] it seems unattractive for PPU services, but we can learn how to provide PPU services [...] Such learning is beneficial when expanding to other customer segments [...].” These other segments include customers who have difficulties accepting the product price premium, but could be attracted by lifecycle cost arguments. Instead, of selling the products with a price premium, GAMMA offered PPU services, by taking advantage of its lower lifecycle costs. The company aimed for a broader customer portfolio, including those with low product usage and those jeopardizing the price premium. In contrast, DELTA argued that PPU services would only attract price-sensitive and low-usage customers. As DELTA’s sales manager stated “[...] (such customers) are not very promising for making profits [...].” DELTA targeted only customers who do not accept the price premium.

GAMMA’s broader customer portfolio mitigated risks for PPU services, which ultimately even influenced the pricing positively. Risks occur through uncertainties in predicting actual product usage for each customer. Whenever usage is unpredictable, a price buffer is included in the PPU fee, but this only constitutes an intermediate solution. To avoid such buffers systematically raising prices above those of the competition, GAMMA hedges the risks among all customers. In contrast, DELTA’s sales manager highlights that: “[...] we often sold pay-per-use contracts to customers with low product usage [...] despite our initial decision not to do so [...]. This increased our risks [...] leading to higher price buffers [...] increasing our prices. [...] making it more difficult to attract customers [...].” Accordingly, DELTA became stuck in a situation in which hedging the risks did not work, because a self-reinforcing feedback loop emerged (lower usage customers raise risks, increasing price buffers, raising prices, and then attracting customers with even lower usage). GAMMA avoided this self-reinforcing feedback loop by hedging risks across a broader customer portfolio, as well as with customers still purchasing products and services.

To cope with the complexity of a broad and heterogeneous customer portfolio, the cases align individual services within the service portfolio. This alignment includes enabling technologies (Brax and Jonsson, 2009), integrating individual services (Kowalkowski, 2011), and clarifying the financial interactions among these services. The enabling technologies (e.g. remote monitoring, self-service technologies, data processes and analytics) make service delivery more cost-efficient.

Integrating individual services means that the interrelationships between individual services are clearly defined. GAMMA's head of service business explained: "[...] When we target customers with low usage, we need to combine this with rental, leasing, and sharing services. A customer with low usage might share the product with other customers, or because of the low usage, the product might be still in good enough condition to rent or sell to other customers." Such an integration is related to the issue of remanufacturing and refurbishing products in such a way that the end-of-life is extended and products can be sold several times (Sundin *et al.*, 2009). Both cases combine PPU services with the used-product business, but in the case of DELTA, such a combination was relatively weak. As DELTA's CEO explained: "[...] we saw that there is potential for our used-product business when we go for pay-per-use services. [...] we have already partnered with a dealer which re-sells our used products [...] We did not want to change that [...]".

Both case companies report aligning services financially in such a way that the profit pools of basic services finance the product cost of PPU services (Cohen *et al.*, 2006). Both cases build initially on a static scheme by taking into account the product and service costs. Companies take back their products that are embedded in PPU services and remanufacture (refurbish) them, so as to increase residual product value. Companies take advantage of this residual value through the used-product business and/or embedding them into new PPU, rental or leasing services. The costs of the PPU services include the product costs minus the residual product value plus the service costs. GAMMA converted such static into dynamic pricing (Storbacka, 2011). GAMMA's CEO explained "[...] service costs and residual value depend not on how long customers have the product, but on the usage level [...]. Usage level again influences pay-per-use revenues, leading to a dynamic interaction [...]" While GAMMA set-up such a dynamic pricing approach, DELTA considered this too complex. A typical statement was "[...] our SAP system does not work like this [...]" Thus, DELTA's static cost scheme was relatively inaccurate in capturing the real costs, so that the company added another mark-up on the price buffer.

The incentive system influences the cost schemes (Cohen *et al.*, 2006). DELTA incentivized selling field services and spare parts, because each intervention generates revenue. For PPU services, such service interventions create costs which are not aligned with the idea of minimizing service delivery costs for PPU services. The head of the service business argued "[...] We cannot run different incentive systems for our services [...] We believe that monitoring the profitability of individual pay-per-use customers would be sufficient [...]" Later, the same person argued that "[...] yes, service costs kept jeopardizing profitability." In contrast, GAMMA successfully incentivized service employees to come up with ideas for minimizing service interventions.

Balancing profits made by PPU services and other business lines. Besides the above-mentioned alignment among individual services in the service portfolio, both case companies reveal the need to balance internal profits. DELTA did not entirely balance PPU services and other business lines. DELTA took back products from PPU services for refurbishing purposes. Afterwards, DELTA sold them either to used-product dealer and/or resells them in new PPU, rental, and leasing services. However, to maximize the margin in these businesses, DELTA favored paying relatively low transfer prices. Thus, used-product businesses were highly profitable, whereas the low residual value received by the PPU

department stressed the PPU pricing even further. By contrast, GAMMA's sales manager actually argued "[...] if we want to expand our PPU business, we cannot maximize the used-product profits. Our PPU department should be able to price PPU services more attractively than our competitors [...]" (it) needs to get an attractive transfer price for the residual product value." Considering these statements and seizing capabilities, it is proposed that:

- P2. Expanding market shares, as a strategic objective for PPU services, is more likely if seizing capabilities entail: (a) broadening the customer portfolio for PPU services, (b) aligning individual services within the entire service portfolio, and (c) balancing profits made by PPU services and other business lines.

4.2.3 New market creation. Comparing the high (IOTA) and low-performing (KAPPA) cases suggests the following seizing capabilities for new market creation: visionary perspective on the opportunities, service portfolio through trial-and-error processes, structural ambidexterity, and collaborating with suppliers and new partners.

Visionary perspective on the opportunities. Seizing capabilities originate from new technologies (e.g. industrial internet, internet of things, digitalization), which can open up promising business opportunities. IOTA combines these technologies with other changes in the business environment. IOTA's CEO argued "[...] all these technologies can open-up new markets, but to really create a tipping point [...] these technologies [...] match with [...] motivating customers to transfer the asset ownership [...]" Some of IOTA's customers needed to conform with new accounting standards, thus triggering the transfer of product ownership. This customer segment was attractive for piloting new PPU services. The knowledge created through such customer pilots enabled IOTA to make the necessary adaptation quickly for a broader commercialization.

Furthermore, IOTA not only envisioned paying for the hours, but went further regarding paying for actual performance. IOTA's CEO explained "[...] paying for the hour is just a starting point, the future is paying for tons, energy efficiency, and kilometers [...]" Such a visionary perspective on opportunities influences market creation positively. Investments in new technologies are more likely to pay-off, if they are utilized for various PPU services. IOTA's CEO explained: "[...] if we want to make our products smart, we cannot only invest in a pay-per-hour approach [...] we should target pay-per-ton, pay-per-kilometer [...]" KAPPA was less visionary, keeping the technology focus mostly on paying for the hour. Investments were nevertheless high, which made it difficult to reach KAPPA's internal profit targets.

Service portfolio through trial-and-error processes. Because KAPPA was convinced that PPU services can disrupt the market, they froze the entire service portfolio relatively quickly, making it easier to specialize in these PPU services. As KAPPA's sales manager explained: "[...] we introduced pay-per-use services as quickly as possible [...]" IOTA was more cautious. As the CEO stated: "[...] we don't know a priori if our pay-per-use services will disrupt the market. [...] we favored tentative trial-and-error steps in experimenting with adding and reducing service elements to the pay-per-use services." IOTA did not freeze the PPU portfolio and tried to use it to scale quickly. It continuously adapted the PPU services through trial-and-error processes and iterated these services between commercialization and industrialization (Kowalkowski *et al.*, 2015; Storbacka, 2011). By doing so, IOTA could learn how these services work in various customer situations. Such learning considerably enriched IOTA's knowledge about scaling these services.

Temporal ambidexterity. Seizing also relates to organizational ambidexterity (O'Reilly and Tushman, 2013). At the beginning, both cases favored temporal ambidexterity, in which they allocate their time between exploiting the existing service business and exploring new markets. KAPPA retained such a temporal ambidexterity initially, but continued quickly with structural ambidexterity. KAPPA relied on the positive experience of separating

product and service businesses (Oliva *et al.*, 2012). Its CEO stated that: “[...] to gain momentum in market creation, we need separate structures, processes, and responsibilities.” IOTA retained temporal ambidexterity. IOTA favored the idea of integration, keeping the activities for the new and the existing market within the same organizational structure (Neu and Brown, 2005). Its CEO explained, “[...] We thought that an immediate separation was too risky. If we keep the same structure, we benefit from knowledge spillovers between existing and new markets.” These knowledge spillovers are likely, because the competences for both the new and existing market are very similar. As the CEO continued “[...] when we look deeper into the competences for the new market and the existing one, it becomes clear that the competences are rather similar.” An interesting effect, for example, is the replacement of competitors’ products. The case companies report that once they manage the entire assets (products) for the customers, they can replace competitor products stepwise with their own ones (Lindahl *et al.*, 2014).

Collaborating with suppliers and new partners. Both case companies collaborate with existing suppliers to successfully create the new market. KAPPA simply continued previous supplier collaboration, while IOTA changed the mode of collaboration. IOTA integrated suppliers into the PPU approach. IOTA’s CEO highlighted “[...] if we let customers pay for using our products [...] we should no longer purchase components, but pay also our suppliers for component usage [...]” Such integration would align the financial flow, starting from the customers to suppliers, making financing PPU services easier. On the other hand, both case companies collaborate with supplementary partners such as technology, finance and insurance companies. For example, insurance companies provide critical risk mitigation knowledge for PPU services and asset management companies specialize on owning the products. By collaborating with such partners, KAPPA favored continuing the collaboration with existing partners, because it could build on established relationships. As KAPPA’s sales manager argued: “[...] our company has a history of partnering with this financial institution [...] we should continue this partnership.” IOTA collaborated with new partners and, on several occasions, decided to exchange partners. IOTA’s COO explained: “[...] if we really want to create a new vision, we should include new partners to challenge us [...] in coming up with innovative solutions.” IOTA’s approach to look for new external partners paid off, while KAPPA highlighted that “[...] relying on existing partners led to quick solutions [...]” But [...] this solution was rather basic and not very innovative. [...]” Overall, considering these statements, it is proposed that:

- P3. Creating new markets, as a strategic objective for PPU services, is more likely if seizing capabilities entail: (a) having a more visionary perspective of the opportunities, (b) defining the service portfolio through trial-and-error processes, (c) retaining temporal rather than structural ambidexterity between existing and new markets, and (d) modifying partnerships with existing suppliers and collaborating with new supplementary firms.

5. Discussion and implications

5.1 Implications for academic research

Despite typical limitations of qualitative research, the findings make four contributions to the academic research. First, the findings reveal that companies can achieve three distinct strategic objectives: rapid sales growth in the market development, market share expansion and new market creation in the maturity phase of the product lifecycle. The first strategic objective extends previous arguments that only under uncertain maintenance and high product cost conditions will companies offer PPU services. Six cases actually deploy PPU services for rapid sales growth during the market development, even if product and service

costs are relatively low and very certain. In addition, companies in the market development phase are argued to mostly rely on services improving product sales and ensuring product functionality, with PPU services being one option in the service offering. The results suggest that PPU services could actually dominate the service offerings and replace other services completely (Cusumano *et al.*, 2015).

Interestingly, expanding market share is in line with claims that PPU services attract new customer segments (Cusumano *et al.*, 2015; Sundin and Bras, 2005). The strategic objective on new market creation links PPU services to the argument that strategic innovations reshape the existing business model, opening-up uncontested markets, and creating a leap in customer value (Christensen *et al.*, 2002; Matthyssens and Vandenbempt, 2008). Overall, these insights offer systematic evidence on strategic objectives of PPU services. Future research can investigate companies that focus on one objective rather than multiple ones. It would be also useful to investigate how these strategic objectives contribute to the overarching goal of PPU services increasing sustainability (e.g. more sensible consumption, more resource-efficient product design) (Bocken *et al.*, 2014; Manzini and Vezzoli, 2003; Williams, 2007).

Besides the strategic objectives, other tactical choices such as following competitors and customer demand do not determine PPU services. Michelin's competitor Goodyear, for example, did not imitate the pay-per-kilometer services. PPU services emerge through strategic decisions rather than tactical considerations.

Second, the findings provide a microfoundation for seizing capabilities. For achieving sales growth, the microfoundation entails (*P1a*) defining the service portfolio, (*P1b*) financing PPU services, (*P1c*) investing in enabling technologies, (*P1d*) providing customer support, and (*P1e*) investing in reverse logistics and remanufacturing to achieve improved resource efficiency. Market share expansion includes (*P2a*) defining the customer portfolio, (*P2b*) aligning the individual service offerings, and (*P2c*) balancing profits made by PPU services and other business lines. New market creation builds on the microfoundation containing (*P3a*) a visionary perspective of business opportunities, (*P3b*) retaining temporal ambidexterity for approaching existing and new markets, and (*P3c*) modifying and extending external partnerships. Altogether, these capabilities are vital for achieving strategic objectives.

Third, the findings advance previous studies focusing on capabilities for the shift from products to services (e.g. Baines *et al.*, 2009; Davies, 2004; Oliva and Kallenberg, 2003). The capability description departs from positivist epistemology that service capabilities increases service outcomes (Luoto *et al.*, 2017). The findings suggest that some capabilities for extending the service offerings (Kastalli and Van Looy, 2013; Kowalkowski *et al.*, 2015) can be counterproductive. For example, modularizing the service offerings (Cohen *et al.*, 2006) does not always ensure success. Instead, rapid sales growth in the market development benefits from narrowing down the offering to PPU services. Structural ambidexterity, or, in other words, separating the product and service business (Oliva *et al.*, 2012) could limit new market creation. The findings on technology capabilities triggering new market creation substantiates previous arguments on technologies as an enabler for services (Allmendinger and Lombreglia, 2005). Charging for customer support services separately, is in line with the notion of making services more profitable (Witell and Löfgren, 2013; Reinartz and Ulaga, 2008).

Capabilities for developing the service portfolio through trial-and-error processes and making PPU services the dominant offering suggest PPU services are not one distinct step in the continuum (shift) from products to services (Oliva and Kallenberg, 2003; Ulaga and Reinartz, 2011). Instead, an evolutionary perspective including tentative trial-and-error steps for creating new markets through PPU services is suggested. For rapid sales growth, companies make a leap into PPU services and do not shift stepwise from products to basic

services, and, finally, to advanced services. PPU services were only observed as a distinct step in the continuum from products to services for market share expansion. The findings depart from continuum thinking about extending the service offerings, to being open to the idea of a leap toward new innovative service offerings, as well as reversing and/or withdrawing from service offerings altogether (Kowalkowski *et al.*, 2017).

Fourth and finally, there is a clear need for quantitative research (such as surveys) to test the propositions on the influence of seizing capabilities on achieving the strategic objectives. The propositions can guide such research, which would yield normative statements concerning optimal configurations of seizing capabilities for achieving each strategic objective. Several researchers have provided frameworks that can guide the operationalization of constructs for empirical research (e.g. Wilden *et al.*, 2013). While appropriate scales and construct descriptions already exist for the strategic objectives, the seizing capabilities require the development of new and adaptation of existing scales.

Seizing capabilities have previously been operationalized as a single construct with multiple items (Wilden *et al.*, 2013). The findings revise this operationalization in two ways. On the one hand, the described microfoundation of seizing capabilities can be used for the item descriptions. On the other hand, instead of a single construct, the findings suggest that seizing capabilities can be a higher order construct, including multiple first-order constructs. The first-order constructs would derive from the present microfoundation of seizing capabilities.

Altogether, these four contributions should advance research on services in product companies from its current theoretical and methodological nascent to a more mature stage (Kowalkowski *et al.*, 2017).

5.2 Practical implications

A number of managerial implications follow from the ideas that have been presented. Detailed facets of the capabilities should be visualized by practitioners, and their current strengths and weaknesses assessed according to these facets. Practitioners should understand that some of the capabilities are counterintuitive compared to common practices. Companies traditionally finance service business expansion internally through profit pools from basic services. Relying on finance partners for PPU services is new for some practitioners. Practitioners have to look into the costs and benefits of setting-up their own financing company and collaborating with banks. Companies tend to think in terms of a stepwise extension of services and believe that a broader and modularized service portfolio is beneficial. Practitioners should be aware that PPU services dominating the offering are beneficial when companies aim to achieve rapid sales growth in the market development. They should also target a broader customer portfolio, even when within this portfolio, some customers might initially fail to achieve the profit targets. Managers should recognize the importance of enabling technologies. Instead of narrowing the focus on product technologies, investment in enabling technologies is necessary. Overall, the findings provide valuable new insights for academics and practitioners alike.

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