The current issue and full text archive of this journal is available at
www.emeraldinsight.com/1757-5818.htm

Exploitation or exploration in service business development?

Insights from a dynamic capabilities perspective

Thomas Fischer and Heiko Gebauer
Institute of Technology Management, University of St Gallen, St Gallen, Switzerland
Mike Gregory and Guangjie Ren
Institute for Manufacturing, University of Cambridge, Cambridge, UK, and
Elgar Fleisch
Institute of Technology Management, University of St Gallen, St Gallen, Switzerland

Received 19 January 2010
Revised 23 March 2010
Accepted 11 May 2010

Abstract

Purpose – The paper aims to explore how dynamic capabilities of sensing, seizing and reconfiguring shape the way in which service business is developed in a broad range of capital goods industries.

Design/methodology/approach – The paper takes an interpretative multiple-case study approach. It seeks to develop primary organizing themes around the key dynamic capabilities and support them with research propositions.

Findings – The findings suggest that companies either exploit or explore the opportunities when it comes to service business development. Moreover, dynamic capabilities differ between the two approaches and predict which way a company chooses.

Research limitations/implications – Research limitations are mainly due to the nature of qualitative research. The dynamic capabilities identified here are by no means exhaustive; rather, they indicate directions for future research.

Practical implications – The research findings provide guidance to managers as to how the strategic shift towards services is influenced by dynamic capabilities.

Originality/value – Despite difficulties associated with service business development, the literature remains relatively silent on dynamic capabilities. However, dynamic capabilities are essential to the strategic shift towards service business.

Keywords Service levels, Corporate strategy, Business development

Paper type Research paper

Introduction

Stagnating markets, growing commoditization and increasingly demanding customer needs are challenging capital goods manufacturers to re-assess their business logic (Davies, 2004; Neu and Brown, 2008; Matthyssens and Vandenbempt, 2008). A product-oriented business logic, that is to design, make and sell capital goods and then consider services as add-ons, is getting obsolete. Meanwhile, companies are starting to adopt a service-oriented business logic, which aims to have strong contribution from services to corporate profit, revenue and customer satisfaction

Journal of Service Management
Vol. 21 No. 5, 2010
pp. 591-624
© Emerald Group Publishing Limited
1757-5818
DOI 10.1108/09564231011079066

(Oliva and Kallenberg, 2003; Brown *et al.*, 2009). Moving from a product-oriented to a service-oriented logic forms part of service business development, known in the literature as servitization, transition from products to services, moving towards high-value solutions or service infusion (Vandermerwe and Rada, 1988; Oliva and Kallenberg, 2003; Davies, 2004).

The literature has traditionally focused on operational capabilities for the service business, including service-orientation in corporate culture (Bowen *et al.*, 1989), human resource management (Homburg *et al.*, 2003; Neu and Brown, 2005), organizational structure (Gebauer, *et al.*, 2009, Oliva and Kallenberg, 2003), service development (Martin and Horne, 1992), IT infrastructure (Matthyssens and Vandenbempt, 1998) and measurement and reward systems (Neu and Brown, 2005). However, these contributions fail to describe the dynamic capabilities necessary to answer the question on how capital goods manufacturers change their operational routines to develop a service business (Cepeda and Vera, 2007). More specifically, existing research mainly neglects the following three capabilities:

(1) sensing service opportunities and threats;

(2) seizing service opportunities; and

(3) maintaining service competitiveness through enhancing, combining, protecting, and when necessary, reconfiguring the intangible and tangible assets of the services for capital goods companies to adopt a service-oriented business model.

Developing such dynamic capabilities is far from easy (O'Reilly and Tushman, 2008; Teece, 2007; Winter, 2003). Capital goods manufacturers still have narrow search horizons when it comes to scan, search and explore service opportunities. They seem to have become the prisoners of the deeply ingrained assumption that service business development emphasizes the provision of basic services such as spare parts, repair, inspection and maintenance for the installed base. This "straightjacket" is evident in the figures reported by Swiss and German associations of capital goods industries. The majority of companies create only a limited percentage of their total revenue through services (72 percent creating less than 20 percent and around 39 percent creating even less than 10 percent). Only 3 percent of the companies achieve more than 40 percent of their total revenue through services (Dilk *et al.*, 2008). Similar figures are reported by Gebauer and Fleisch (2007), Homburg *et al.* (2002) and Meiren (2006). Furthermore, around 95 percent of the service revenues can be attributed to spare parts, repair, maintenance and training services, while only the remaining 5 percent to innovative new services (VDMA, 2005).

At the company level, take the Comau Incorporation as an example. It faces difficulties in seizing the service opportunities. Its business model on supporting customers from product engineering via production systems to maintenance services has led to an increase in the share of service revenue from 14 to 19 percent between 2005 and 2008, but the decline in corporate revenue of about 29 percent in the same period indicates that Comau's structures, processes and incentives for seizing the business model are not without debate. In the case of ThyssenKrupp, it sensed and seized the opportunity of moving into the service business by establishing ThyssenKrupp Services as a separate business division. Despite being highly profitable, ThyssenKrupp Services has decided to sell the industrial service business. It failed to enhance and reconfigure the service business for a better integration with the other

business units. Similarly, Dürr, manufacturer of paint and assembly systems for the automotive industry, sensed the need for outsourcing services in the automobile industry. But it met great difficulties when it tried to offer outsourcing services by taking over the customer's painting and assembly process and to reconfigure its business model. The changes were too challenging and finally led to the decision to sell the service unit.

These are, of course, only anecdotal evidences. However, we believe that success in service business development depends not only on operational capabilities but also on dynamic capabilities, which underpin the operational capabilities. The goal of this study is to analyze the dynamic capabilities necessary to develop the service business. More specifically, this study has four primary objectives. First, we explore the sensing, seizing and reconfiguring capabilities in search of common themes underlying service business development. Second, we seek to provide an in-depth description of specific capabilities contributing directly to or creating unanticipated side effects for service business development. Third, articles on service business development have not emphasized challenges when it comes to dynamic capabilities. In line with this reasoning, we aim to explore what additional problems might occur when capital goods manufacturers undergo the fundamental change in their organization necessary to develop a service business. Finally, we aim to develop testable propositions related to the issues under investigation.

Dynamic capability perspective on service business development

The background to the study lies partly in the strategic management literature focusing on dynamic capabilities and the literature on services in manufacturing companies. This section begins with an overview on dynamic capabilities. It then focuses on the disaggregation of dynamic capabilities in the context of service business development and the integration of service management literature into the disaggregation.

Achieving competitive advantages requires the formation of core capabilities (Prahalad and Hamel, 1990). As environmental conditions change, core capabilities can become irrelevant or can create rigidities and inhibit the formation of other capabilities (Leonard-Barton, 1992). In such conditions, firms create a competency trap for themselves, becoming ever better at an ever less relevant set of processes (Tallman, 2003; Teece *et al.*, 1997). To avoid the competency trap, besides pure operational capabilities that enable a company to earn a living at present (Winter, 2003), companies also need dynamic capabilities (Teece, 2007). Dynamic capabilities encapsulate the evolutionary nature of resources and capabilities, which complements the static perspective of the resource-based view of the firm (Eisenhardt and Martin, 2000; Helfat, 1997; Teece *et al.*, 1997; Zahra and George, 2002). Helfat *et al.* (2007) define a dynamic capability as the capacity of an organization to purposefully create, extend, or modify the tangible, intangible, and human assets/resources as well as capabilities, which the company owns, controls, or has access to on a preferential basis.

Teece (2007) divides dynamic capabilities into three classes:

(1) sensing capabilities to sense and shape opportunities and threats;

(2) seizing capabilities to seize opportunities; and

(3) reconfiguration capabilities to maintain competitiveness through enhancing, combining, protecting, and, when necessary, reconfiguring the business enterprise's intangible and tangible assets.

In other words, dynamic capabilities include the capacity to identify the need or opportunity for change, formulate a response to such a need or opportunity, and implement a course of action (Helfat *et al.*, 2007). Examples of dynamic capabilities include cross-functional R&D teams, new product development routines, alliance and acquisition capabilities, resource allocation routines, quality control routines, technology transfer and/or knowledge transfer routines, and performance measurement systems used to build, integrate, or reconfigure other resources and capabilities (Eisenhardt and Martin, 2000; Teece, 2007).

Dynamic capabilities have been little used in the context of service business development. In the next section, we try to link existing research with sensing, seizing and reconfiguration capabilities.

Sensing and identifying the need for change towards a service-oriented business

Sensing and identifying the need for change towards a service-oriented business are triggered by three major drivers (Kindström *et al.*, 2009). First, the erosion of product-based competitive advantages squeezes product profitability (Matthyssens and Vandenbempt, 2008). Pure product differentiation is increasingly difficult to maintain as a lasting strategy (Mathieu, 2001). Services seem to be a potential competitive force to compensate the lack of product differentiation (Bowen *et al.*, 1989; Vandermerwe and Rada, 1988). Service strategies provide strong differentiation opportunities (Mathieu, 2001), because they are more labor-intensive and, when services are combined with products, the offerings become more difficult to compare (Simon, 1993; Malleret, 2006).

Second, the increasing complexity of customer needs drive companies to identify the need for change. The complexity of customer needs involves customers who increasingly differ on how they want to satisfy their needs (Neu and Brown, 2005). For example, confronted with the pressure to create more flexible firms, customers apply narrower definitions of their core competencies and have a rising need for service outsourcing. Some customers even wish to reduce the capital employed for buying capital goods. Instead of owning the equipment, they would like to pay for its usage (Windahl *et al.*, 2004).

The third driver refers to the huge cumulative installed base of capital goods currently used by customers. The installed base is reported to raise revenue substantially and yields attractive service revenue (Cohen *et al.*, 2006; Potts, 1988; Wise and Baumgartner, 1999). Owing to the fact that services are a more stable source of revenue than products, capital goods manufacturers sense the opportunity to compensate the volatile product business through more resistant and counter-cyclical service revenue (Simon, 1993).

Identifying these three triggers is limited by managerial cognition. Managers, for example, overemphasize obvious and tangible characteristics (Kahneman *et al.*, 1982) and tend to sense the more obvious product opportunities in favor of the less tangible and obvious service opportunities (Gebauer *et al.*, 2005). Furthermore, managers may not believe in the economic potential of an extended service business, because the existing cost structure of considering services as fixed and not as variable costs makes it difficult to accurately estimate service profit (Mathieu, 2001). Managers often prefer less risky outcomes from investing resources in products to more uncertain outcome of investing in services (Einhorn and Hogarth, 1986; Gebauer and Fleisch, 2007). Managers behaving risk averse would therefore deliberately reallocate resources from the service to the product business.

Seizing service opportunities and formulating a strategic response

Seizing opportunities refers to the formulation of a strategic response. Considering Mintzberg's and Waters' (1985) strategy continuum, where "deliberate – realized as intended" and "emergent – realized but not intended" form the two ends of the continuum, Gebauer *et al.* (2006, p. 381) argue that "this [service strategy] [. . .] functions as a deliberate strategy".

The decision to seize the service opportunities is associated with concrete planning of the entry into the service market. Decision makers tend to be more planners than entrepreneurs (Mintzberg, 1973, 1978). Seizing service opportunities is, therefore, considered as formulating deliberate (planned) service strategies.

Relevant service strategies include, for example:

- systems integration;
- operational services; and
- business consulting (Davies, 2004).

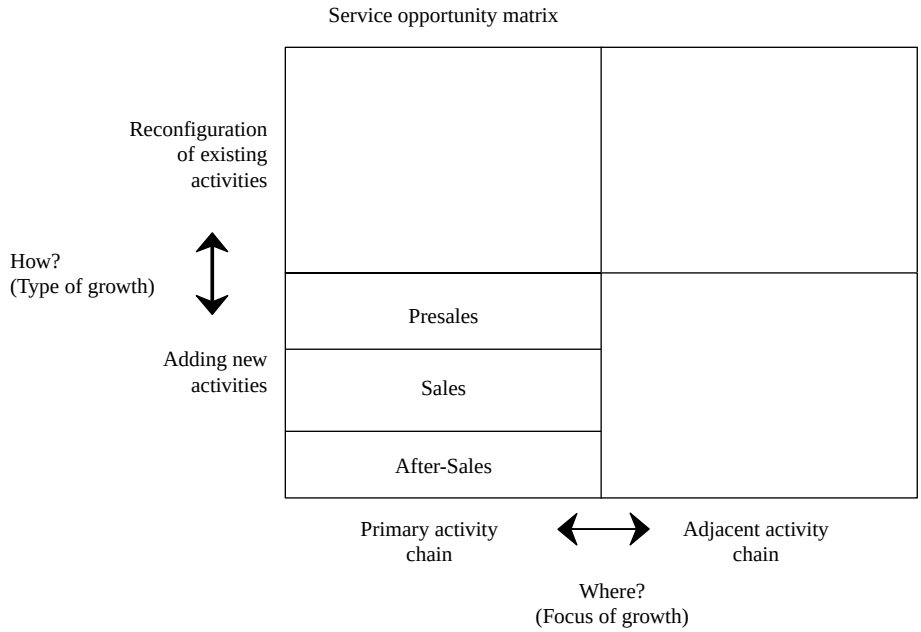
Systems integration means integrating components into a functioning system. It includes business process integration and technical application integration. Business process integration refers to seizing customer value by integrating business processes of the customer. Technical application integration refers to fine-tuning the technical solution to the specific needs of the customer (Matthyssens and Vandenbempt, 2008).

Closely related to business process integration is the notion of operational services. These include services for operating and maintaining products (Davies, 2004). Operational service strategies can either focus on offering services to the customer in the event of any breakdown or failure (Mathieu, 2001; Gebauer, 2008) or on increasing customer efficiency and effectiveness through tailoring maintenance services to individual customer needs.

Business consulting involves services to advise customers on designing, financing, purchasing, maintaining and operating the capital goods (Davies, 2004; Kotler, 1994; Davies *et al.*, 2007). By offering design services, customers benefit directly from the company's development competencies. Both the company and its customers collaborate with each other and share intimate knowledge. This creates a situation in which the competency position directly and indirectly makes it more difficult for competitors to catch up (Dierickx and Cool, 1989; Wernerfelt, 1984).

Common to these service strategies for seizing opportunities is their strong focus on the customer's primary activity chain. The customer's primary activity chain is related directly to the usage of the capital good. Companies can address the primary activity chain by either adding services (temporal expansion) or reconfiguring existing services and structures (temporal reconfiguration) (Sawhney *et al.*, 2004). Typical illustrations of temporal expansion are adding technical advice in the pre-sales phase, information service and financing in the sales phase, and repair and maintenance services in the after-sales phase. Temporal reconfiguration includes changing the structure and control of the primary activity chain, for example, through providing outsourcing services where companies take over the responsibility for customer processes. The four central strategic options to address service opportunities are known in Figure 1.

The various service strategies neglect seizing opportunities in the adjacent, complementary customer activity chain. These activities are not directly related with



Note: The four elements of the service opportunity matrix include, (1) temporal expansion: growth from services that add new activities to a primary activity chain, (2) spatial expansion: growth from services that add new activities to an adjacent chain, (3) temporal reconfiguration: growth from services that change the structure and control of activities within the primary chain, and (4) spatial reconfiguration: growth from services that change the structure control of within an adjacent chain
Source: Sawhney *et al*. (2004)

Figure 1.
Service opportunity matrix

activities arising around the product, but can be best considered as post-sales or post-purchase. Sawhney *et al.* (2004) argue that these opportunities can be also seized by either adding services to the adjacent customer activity chain (spatial expansion) or reconfiguring the control and structure within the adjacent activity chain (spatial reconfiguration). The various terms (i.e. temporal expansion, temporal reconfiguration, spatial expansion and spatial reconfiguration as well as primary and adjacent customer activity chain) have their origin in Sawhney *et al.*'s (2004) service opportunity matrix.

Whereas literature is rich on describing potential service strategies, it remains silent on issues related to the actual necessary activities for strategy formulation and implementation. To the best of the authors' knowledge, there are only three exceptions:

(1) Neu's and Brown's (2005) description of decision-making authority as a key for business-to-business service development.

(2) Paiola *et al.*'s (2009) investigation of small and medium enterprises approaching the service business.

(3) Oliva and Kallenberg (2003) raising the question on how the change towards services should take place (gradually or in leaps) (Oliva and Kallenberg, 2003, p. 162).

Referring to the latter, the literature agrees that services challenge the conventional ways of thinking in the capital goods industry. Nevertheless, it remains unclear whether the challenges can be best dealt with by approaching the service business in an incremental or a radical way (Brax, 2005; Matthyssens and Vandenbempt, 1998; Stremersch *et al.*, 2001).

Neu and Brown (2005) argue that successful companies decentralize their decision-making authority during the formation of service strategy. Information processes such as acquiring external and internal information, inter- and intra-firm sharing of information, conceptual utilization of information and instrumental utilization of information (Kohli and Jaworski, 1990; Neu and Brown, 2005) are reported to play a key role in the companies' move towards services. Their interrelation and characteristics depend on the value chain position (supplier or original equipment manufacturer) or sales model (indirect sales model through distributors or direct sales model through subsidiaries) (Paiola *et al.*, 2009).

Reconfiguring and matching service strategy and organizational design

Reconfiguring capability means matching and managing the bilateral dependence between service strategy and organizational design to achieve strategic fit (Teece, 2007). The relevant organizational factors for re-orienting capital goods manufacturers towards services can be classified into four dimensions (Matthyssens and Vandenbempt, 1998; Neu and Brown, 2005; Oliva and Kallenberg, 2003; Gebauer *et al.*, 2005; Johnstone *et al.*, 2008; Galbraith, 2002; Shah *et al.*, 2006; Mintzberg and Westley, 1992):

(1) corporate culture;

(2) human resource management;

(3) organizational structure; and

(4) service development process.

In the context of reconfiguration, Oliva and Kallenberg (2003) suggest that service business development starts with consolidating product-related services (services related to goods), proceeds with entering the installed base service market, continues with expanding to relationship-based services or to process-centered services, and ends with taking over the end-user's operation. Moving along these four phases is described as transitioning from product manufacturers towards service providers. According to Davies (2003), manufacturers proceed gradually through the stages from:

(1) manufacturing to;

(2) systems integration, then to;

(3) integrated solutions in which services are added to systems, and further to; and

(4) operational services and even intermediary services.

Nevertheless, the literature rarely recommends how to achieve strategic fit. A strategic fit refers to the congruence between the aspects of a given service strategy (including strategic market offering) and the aspects of a given organizational design. Strategic fit leads to coalescence, where service strategy and organizational factors are internally consistent, complementary and mutually reinforcing. It enables companies to achieve above-average company performance.

However, there are two exploratory studies on the potential strategic fit. One refers to the investigation of strategy-structure configurations in the service business of manufacturing companies (Gebauer *et al.*, 2010b) and the other focuses on the investigation of the interrelationship among patterns of service strategy changes and organizational design elements (Gebauer *et al.*, 2010a). According to the findings, managers have to learn about how they align organizational elements with different service strategies. The implementation of operational services focusing mainly on maintenance services requires, for example, a separation between product and service business, whereas offering basic services is more successful if companies integrate the service organization into the product-oriented business units. Similar recommendations are made with regard to the service orientation of corporate culture, human resources, organizational structures and service development (Gebauer *et al.*, 2009; Homburg *et al.*, 2003; Bowen *et al.*, 1989).

Strategic fit among activities is fundamental to sustainability of competitive advantage (O'Reilly and Tushman, 2008). But outdated fit might make it more difficult to change strategy and to move into a different strategic fit or internal congruence between service strategy and organizational design.

In summary, dynamic capabilities have been little used in the context of service business development. To build a solid theoretical base for the further analysis, the literature review tried to link existing research on services in manufacturing companies to strategic management literature on dynamic capabilities using Teece's (2007) disaggregation of dynamic capabilities into sensing, seizing and reconfiguring capabilities. We discussed three major drivers for sensing service opportunities and the need for change (decreasing product profitability, increasing complexity of customer needs, huge cumulative installed base of capital goods) which is, however, limited by managerial cognition that tends to favor sensing the more obvious and tangible product opportunities. Seizing service opportunities is described as the formulation of deliberate (planned) service strategies as strategic response, rather than emergent ones (Mintzberg and Waters, 1985). Service strategies in the literature strongly focus on the customer's primary activity chain but neglect seizing opportunities in the adjacent, complementary customer activity chain (Sawhney *et al.*, 2004). Reconfiguring capabilities refer to achieving strategic fit between service strategy and organizational design (Teece, 2007). Despite much research on organizational factors for re-orienting capital goods manufacturers towards services, the literature rarely recommends how to achieve strategic fit.

Research methodology

Since dynamic capabilities are difficult to imitate, their complex nature makes it also hard to identify them for research purposes. Thus, the study relied on an interpretative multiple-case study approach across a range of capital goods industries with different firm sizes and in two countries (Switzerland and Germany) (Table I). Analyzing different industries, firm sizes and countries is especially important since these are subject to different environmental demands that may affect the way that firms approach the development of the service business. The research activities were conducted between 2000 and 2008. Table I illustrates the time frame for each case study. As service business development is a long-term organizational change, the time frame covers various years.

Case studies	Number of employees	Time frame	Industry	Products	Service business development
A	1,200	2004-2005	Automotive, aerospace	System solutions for tool and mold making	A established services to increase its customers' efficiency and effectiveness in the tool- and mold-making process. Service offerings include spare and wear parts, consumables, repair, inspections, maintenance services and process optimizations
B	1,100	2005-2006	Manufacturing technology and assembly automation	Machinery and systems for large volume production	B established an after-sales service business including spare parts, repairs, inspections, hotlines, installations, commissioning based on unbundling the pricing of products and services. B's service organization was set up in such a way that it can quickly and reliably react to product faults
C	8,000	2004-2006	Production and medical industries	Machine tools, power tools, laser and medical technology	C moved towards providing customer-support services that prevent product faults and lead to an increase in product availability within the customer process, such as preventive maintenance, process optimization or extensive user training
D	7,600	2000-2006	Food processing	Production systems and process technology	D extended its range of rather reactive after-sales services to include preventive maintenance contracts and customer-support services to increase efficiency and effectiveness of its customers' processes
E	1,600	2005-2007	Metal processing	Systems and solutions for bending, laser and waterjet cutting	E's service offering includes spare parts provision, repairs, inspections, preventive maintenance, and customer trainings. Responding to competitors' service offerings, E also developed customer-specific maintenance packages

(*continued*)

Table I.
Overview of case companies

Table I.

Case studies	Number of employees	Time frame	Industry	Products	Service business development
F	700	2001-2006	Power generation, aerospace, automotive, other production	Machining centers and flexible manufacturing systems	F's service offering includes a broad range of after-sales and customer-support services such as spare parts provision, repairs, inspections, preventive maintenance, and customer trainings. Responding to customer needs, F also developed a special capacity support service with which F offers its customers additional production capacity to deal with demand peaks
G	1,800	2004-2005	Metal processing	Fineblanking and automation technology, compound parts	G professionalized providing basic services such as spare parts, repairs, inspections and maintenance for its metal processing machines through more active marketing and selling services which were mostly add-ons to product sales
H	4,500	2001-2007	Food processing, healthcare, personal care, pharmaceutical	Handling and packaging systems, robotics	H established a separate service business unit as a profit center to promote and further develop its service business. The service offering includes product-related after-sales services and customer-support services such as sophisticated maintenance contracts, service level agreements and process optimization
I	200	2004-2007	Automotive and construction	Systems and solutions for glass processing	I extended its service business successively to become a development partner for its customers. Apart from traditional product-related after-sales and preventive maintenance services, I offers its customers process and productivity consultancy as well as individual machinery development and construction services in a separate profit center for services

(*continued*)

Case studies	Number of employees	Time frame	Industry	Products	Service business development
J	330	2003-2006	Metal processing	Die casting machines	J traditionally offered a broad range of services related to its products which are part of integrated die casting cells including robots, transfer line, and heating and cooling equipment. To respond to customer requirements for integrated solutions, E developed design and construction services for the entire die casting process to improve the match of die cell concept and component design
X	550	2003-2004	Machining	Precision cutting tools	X developed a holistic tool care service concept to address customer requirements of supplementary activities such as financing tools, optimizing the range of tools, and assuming logistics tasks
Y	20,400	2001-2007	Construction	Professional power tools	Y developed an integrated service concept for managing its customers' tool fleets which involves taking over the administrative customer processes including services such as repairs and device exchanges. The development of the new service concept led Y to completely redefine its business model
Z	61,000	2006-2008	Automotive	Automotive components and systems	Z changed from a product-oriented to a service-oriented business model based on leasing its products and making business with services for the final user. The change included a redefinition of the entire network of business relationships

Table I.

The study is based on inductive data inquiry in 13 companies. We selected these companies because they have a substantial history of providing capital goods and services. All companies were known to have high-performing business service initiatives. Senior-level managers served as key informants for each case study and supported us in conducting site visits and interviewing key executives. A site visit protocol consisting of the description of data collection procedures and interview guides was developed to guide our research (Yin, 1994). In each company, we interviewed between three and six informants from functions such as product sales, service sales, product management, logistics, controlling and human resources. The informants were asked to give a detailed account of their experiences in attempting the service business development. The subjects provided illustrations of dynamic capabilities.

The interviews were semi-structured. Consistent with the narrative approach (Miles and Huberman, 1994), follow-up questions were used to explore capabilities driving service business development, as well as common themes around dynamic capabilities (sensing, seizing and reconfiguring). At the end of each interview, informants were asked for further comments on the service business development. Additional insights into dynamic capabilities therefore emerged inductively from the fieldwork. The interviews and follow-up questions for future interviews were recorded on the visiting protocol (Miles and Huberman, 1994). These detailed written accounts were also developed to integrate findings across different informants. Each key informant reviewed the corresponding case study. By allowing informants to review their case studies on service business development, we were able to eliminate some of the bias associated with retrospective interviews.

To assure validity of data analysis, manual and computer-aided content analyses were used, based on QSR NUD*IST (NVivo 7.0©) procedure (Strauss and Corbin, 1998). The analysis started with a within-case analysis of each company. The idea was to become familiar with each case as a stand-alone entity. In addition, we assumed that this procedure would help us become familiar with each case that, in turn, accelerates the cross-case comparison. The within-case study analysis allowed the dynamic capabilities to emerge before we transferred findings during the cross-case analysis (Eisenhardt, 1989).

Closely coupled with the within-case analysis is the cross-case analysis. During the cross-case analysis, we looked for similarities and differences in the role of dynamic capabilities. By applying the within- and cross-case analysis, we do not primarily take a grounded theory approach (Drumwright, 1994; Gilly and Wolfinbarger, 1998), but rather develop primary organizing themes with supporting propositions around the dynamic capabilities. In other words, since our study was guided by the disaggregation of the dynamic capabilities, we allowed specific sensing, seizing and reconfiguring capabilities to emerge inductively from the fieldwork. As they did, we turned to the research outlined in the Dynamic capability perspective on service business development: a literature review to help to conceptually define the dynamic capabilities and develop our understanding of how they are interrelated with service business development.

Service business development in capital goods companies

The discussion of the results begins with a distinction between two approaches for service business development. The section then focuses on each approach, describing the phases which characterize the approaches.

Exploitation or exploration: two distinct approaches for service business development

The findings reveal two different approaches to service business development. The first approach can be described as exploitation of service opportunities through temporal expansion of the service business along the primary customer activity chain. Ten of the 13 case companies adopted the exploitation approach. Exploiting service opportunities along the primary customer activity chain continuously increases the share of revenue attributed to services. Over a period of about ten to 12 years, the share of service revenue of the exploiting companies grew from about 10 to 27 percent. In these cases, the business logic incrementally became more service-oriented through specific value-adding services (Möller, 2006). Exploiting service opportunities focuses on efficiency of capital goods in customer processes, increasing service productivity, controlling the access to the installed base, certainty of financial service revenues and profits, and reducing the variance of competitors' reactions by creating a dominant design in the total offering (O'Reilly and Tushman, 2008). Exploiting companies are primarily driven by increasingly comprehensive customer needs within the primary customer activity chain and the desire to differentiate the total offering from competitors.

The second approach mainly focuses on exploration of service opportunities through spatial expansion and reconfiguration along the adjacent customer activity chain. In other words, it is about searching and discovering new service business opportunities by enhancing the autonomy to innovate new services. By exploring service business opportunities, companies embrace strategic variation (O'Reilly and Tushman, 2008).

The evidences imply that these companies "jump" to a new strategic state, which focuses on services addressing the customers' adjacent activity chain. For example, the tool care concept of the manufacturer of precision cutting tools formed a new value constellation. The cutting tool manufacturers learn that the customers' handling costs exceeded the purchasing costs of the products. Of course, handling activities (storing, ordering, administering or controlling) were not part of the customers' primary activities of using the precision tools (using, repairing or maintaining), but were interpreted as offering attractive market potentials.

Participants in our study used the term "radical" to describe their service business development efforts. The leap towards the new strategic state is evident in the share of service revenue. In contrast to the exploiting companies, companies following the exploration approach increased their share of revenue attributed to services from less than 20 percent to more than 40 percent within a relatively short period of about five years. The latter not simply added services for their customers' adjacent activities, but rather concentrated on reconfiguring the responsibilities within the value chain. By "jumping" into the adjacent customer activity chain, the companies transferred their initial success with corresponding services for the customers' primary activity chain. This change process may include major reconfiguration of the organizational arrangement, value-creating processes, business relationships and roles of the participants, and even the whole business model. Exploration forms a new value constellation based on services, which makes the former way of how companies competed with each other obsolete.

Needless to say, exploration is not free from exploitation activities. Participants considered the first approach as purely exploitative. Instead, the second approach rather emphasizes ambidexterity (O'Reilly and Tushman, 2008), which is the ability of a firm to simultaneously exploit and explore. However, the key issue of the second approach was exploration, hence named as such. Table II illustrates both approaches

Table II.
Characteristics of the exploitation and exploration approaches

Characteristics	Approaches for service business development Exploitation	Exploration
Type of organizational change	Incremental improvements of the existing strategic stage	Radical, jump towards new strategic stage
Primary addressed service opportunity (customer activity chain)	Temporal expansion within the primary customer activity chain	Spatial reconfiguration within the adjacent customer activity chain
Value constellations	Value-adding to existing value constellations	Defining new value constellations
Service-oriented performance improvements	10-27% of share of service revenue within a period of ten to 12 years	From less than 20% to more than 40% share of service revenue within about five years

and summarizes their key characteristics. The next two sections describe the main phases on both approaches in more detail.

Exploitation of service opportunities

Exploitation consists of three phases:

(1) integrating the basic services into the product price;

(2) separating product and service business to extend service profit and revenue; and

(3) making use of the service expansion along the primary customer activity chain.

Table III summarizes the three phases and highlights the main sensing, seizing and reconfiguring capabilities.

In each phase, there are dedicated capabilities for sensing, seizing and reconfiguring. The results focus on the similarities across the ten cases and are mostly reported if there are not any differences among the companies. However, there are also some exceptions, which prevent generalization and transferability. Space considerations do not permit us to illustrate the exceptions in every detail, but we will highlight a few anomalies that might be interesting for future research.

Phase 1: integrating the basic services into the product price. For exploitation, the market structure is considered exogenous, while service opportunities are determined by competitor offerings and obvious customer needs. Based on comparing service offerings with competitors' offerings, companies exploit value opportunities whenever competitors introduce new services to the market.

The sensing activity relies on using services to differentiate the total offering and integrating them into the product price. As explained below, this type of the total offering can be interpreted as the early dominant design of the total offering, where service profit is embedded into the product price. Adding new services to the total offering would, therefore, facilitate the differentiation of the product and create additional service costs. Once the new service has been introduced to the market, companies reconfigured their service processes and structures to achieve minimum operational costs. The typical organizational setup was to integrate the service business as a cost center into the product organization (Noch, 1995). In essence, companies strived to create a business model that builds cost advantages in the service infrastructure and to protect the installed base, and thereby imitated competition itself.

	Phase 1: integrating basic services into the product price	Phase 2: separating product and service business to extend service profit and revenue	Phase 3: making use of the service expansion along the primary customer activity chain
Sensing capabilities	Focus on identifying service opportunities to differentiate total offering and which can be integrated into the product price Information-gathering routines to observe competitors' service offerings and behavior Information-gathering routines to observe obvious customer needs Fast and reliable information-processing capacity to prepare strategic response and quick reaction to competitors' service activities	Sense service opportunities by combining obvious customer needs, adding services to customers' primary activities and the possibility to charge for services Processes and routines to identify service profit opportunities from services which can be charged Information-gathering and information-filtering mechanisms for service opportunities for customers' primary activities Capacity to exploit existing knowledge on customer requirements in customers' primary activities Customer sensing capability in terms of assuming customers' perceived risk of service purchase	Information-gathering and information-processing routines to constantly generate intelligence about customers' expressed needs in the primary activity chain Sensing capability narrowed to services that can be added to the core product offering (either embedded or charged for separately) and that do not change the dominant design
Seizing capabilities	Routines of quick and timely decisions to create a dominant design of the total offering Capacity to form a dominant design (tactical choices on bundling and charging goods and services)	Routines of quick and timely decisions to adapt strategy to charge customers for services Exploit service profit opportunities by charging for services which were previously offered for free Capacity to commercialize services that were originally included in the product prices and communicate changes to customer	Capacity to satisfy customers' expressed needs in the primary activity chain and to formulate strategic responses Formulate "planned strategies" for service business development involving a rigid scenario planning Articulate intended strategies early and clearly to direct information-gathering/information-filtering and to focus management attention

(*continued*)

Table III.
Dynamic capabilities for exploiting service opportunities

		Phase 1: integrating basic services into the product price	Phase 2: separating product and service business to extend service profit and revenue	Phase 3: making use of the service expansion along the primary customer activity chain
Reconfiguring capabilities	Capacity to redesign service processes and structures to achieve minimum operational costs (set up cost center in product organization) Procedures and routines to minimize service costs to achieve service profits embedded in product prices		Ability for deliberate strategy planning and execution to create a distinct professional service business (business manager qualities) Ability to turn service activities into a professional business and make it profitable (business manager qualities) Managerial awareness of potential threats from formulating a deliberate profit-oriented service strategy and ability to deal with threats Capacity to overcome internal resistance and conflicts Capacity and resources to set up a separate strategic business unit for services with own profit-and-loss responsibility	Strategic vision that articulated strategies respond to the development of customer needs and competitors' service offerings Routines to reconfigure assets and resources to protect the spare parts business from imitation Routines include maximizing the ratio between manufactured and purchased parts, controlling the parts supply chains and optimizing parts logistics Capacity to reconfigure technical assets to ensure remote access to the installed products for condition monitoring, service activities and use of copied parts

Table III.

Once the service infrastructure was aligned to be cost efficient, the only remaining uncertainty referred to whether competitors followed a similar service path. Accelerated by the significance of competitor service offerings for exploitation activities, the management focused on quick and timely decisions to create a dominant design of the total offering. Forming a dominant design includes tactical choices on how to bundle capital goods and services and how to charge them (Malleret, 2006). The intention was to be first to design the total offering and the underlying revenue and profit streams. Once a dominant design begins to emerge, competitors' choices to offer additional services or to charge for services in a different way become much more limited.

At the beginning, a typical emerging dominant design referred to the integration of basic services into the price for capital goods. This means that basic services such as training, installations, inspections, repairs or maintenance activities were not charged for separately, but were offered for "free" to the customers. On the one hand, customers were driving the emerging dominant design to evolve because it reduced their risks of unpredictable service costs. On the other hand, in times of attractive product margins in the capital goods industry, services were interpreted as add-ons to products for the mere purpose to facilitate product sales. There was no strong need for services to contribute to company revenues and margins. By minimizing service costs, service profits could be embedded in the product prices. Altogether, there was only one exception to this early dominant design on integrating services into the product price. One company never integrated services into the product prices, but charged services separately from the beginning.

Seizing and reconfiguring this early dominant design and reconfiguring the internal organization (e.g. service organization as cost centers within the product-oriented business units) to achieve a strategic fit created an unanticipated side effect (Oliva and Kallenberg, 2003; Gebauer *et al.*, 2009). Looking at services from the cost advantage perspective did not lead internal processes and routines to look beyond obvious customer needs. The attention was focused on customer requirements in terms of ensuring the functionality of the capital goods.

Phase 2: separating product and service business to extend service profit and revenue. Confronted with eroding margins, the early dominant design was getting obsolete. Prices got highly under pressure and there was no remaining margin to embed service profits. Thus, companies' sensing activities started to look for new service profit pools (Reinartz and Ulaga, 2008).

Applying quick and timely decision routines, the management focused on services already offered to customers. New service profit pools were seen in charging separately for services which were originally included in the product prices. Sensing, seizing and reconfiguring activities concentrated on exploiting these profit pools. Reconfiguring their organizational structure, companies set up a separate strategic business unit for services with profit-and-loss responsibility. This forced these service units to sell services separately and to increase profits and revenues attributed to services (Auguste *et al.*, 2006; Oliva and Kallenberg, 2003).

As a separate strategic business unit, the service organization controls service sales, delivery and innovation activities (Gebauer *et al.*, 2009). To succeed quickly in these activities, sensing and seizing capabilities concentrate on obvious customer needs and value opportunities of adding services to the customers' primary activities combined with the opportunity to charge for services. The rationale for concentrating

the attention and information gathering and filtering processes on the customers' primary activity chains results from the familiarity with this type of activities. Managers simply argued that they had already established a cumulative knowledge on customer requirements for their primary activities and wanted to exploit this knowledge rather than exploring new opportunities for customers' adjacent activities (O'Reilly and Tushman, 2008; March, 1991). Managers assumed that customers used product reputation as a proxy when evaluating services for customer activities related to operating and maintaining their product. The perceived risk of customers when they considered the purchase of a service from a capital goods manufacturer with a superior product reputation was assumed to be relatively low.

To successfully launch and run the strategic service business units, internal procedures and activities needed to be changed from administering the service costs and reacting to customer complaints towards managing the service business in a professional and profitable way. Business managers were best suited to plan and execute the strategy to run the service business unit.

The separation of product and service business was also driven by managerial awareness on potential threats. If managers formulate a deliberate strategy to sell more services and to increase service revenue, the authority, expertise, responsibilities or resources of traditional product sales will change (Ashforth and Lee, 1990). This potential threat for the sales organization leads to internal resistance to formulating a service strategy and high political costs for overcoming the resistance. To minimize political costs and to avoid resistance, managers tend to set up a separate business unit for services.

Managerial awareness of emerging threats from keeping product and service business integrated was accelerated by the risk to lose customers to more efficient core-value producers in the product or service business. Separate business units for products and services were often argued to be the optimal response to competitors only concentrating on products or specialized service providers.

There are two exceptions to the separation of product and service business. One company followed the separation, but after changes in the geographical distribution of the revenues favoring Asian markets, the company decided to re-integrate product and service business units. Another company acquired a company with separate product and service business. This acquisition convinced the company to keep both product and service business separated after few adjustments in the degree of separation. These adjustments focused on forming customer-focused business units that function as a matrix organization overlapping the product and service business units.

Phase 3: making use of the service expansion along the primary customer activity chain. The service expansion included subsequent changes in the total offering. The first change included ensuring the functional capability for the period in which the customer uses the product. In the event of any failure, services were offered to the customer. The total offering included standardized, predefined services such as spare parts, repair, inspection, a hotline and basic training, which were priced and charged for individually as a markup for labor and parts (Oliva and Kallenberg, 2003). The next change led to individual maintenance service packages. To make the individual service package more attractive to customers, the services were priced on the basis of typical performance measures such as machine availability (up-time) and yield and not based on costs of performing scheduled maintenance services (Oliva and Kallenberg, 2003).

The final change captured R&D-oriented services in the pre-sales phase, where companies designed or constructed the product in line with customer-specific technical requirements. The design and construction services were charged for separately. If the customer purchased the product designed, the service price was then refunded.

Indeed, the information gathered and communicated inside the companies following the exploitation had mainly decision relevance when it came to pricing issues. The product sales gathered information on services that should be embedded in the product price and services that were charged for separately and communicated it internally. The goal was to communicate the impact of charging for service on the product prices, but not to reconsider the dominant design of the total offering with its underlying revenue and profit streams. The difficulty to break through the dominant design is evident in the fact that companies even sell their products at cost-price level to increase their market share of the installed base leading to increased revenue and margins from their service business.

The narrowness of sensing activities was accelerated by the methods and procedures applied to peer through the information. Making sense of the gathered and filtered information was directed through early articulating the intended service strategy by top management or central business development. Thus, the articulated service strategies for service business development (e.g. after-sales service or customer-support service strategy) became a filter on management attention. For that reason, management attention was not diverted to every service opportunity. Rather, it was focused on the deliberately articulated service strategies, which were not validated and challenged with alternative strategic avenues. The deliberate service strategy was more like a rigid scenario planning that only involved one scenario on how customer needs and competitors' service offerings will be developing, similar to Mintzberg's and Waters' (1985) "planned strategy".

Owing to the fact that companies considered only one scenario for service business development, there were very few different investments paths for service innovations. Here again, the only remaining uncertainty referred to whether competitors followed a similar service innovation path. The prevalent path to service innovations started with services for the installed base, then continued with maintenance services and finally led to R&D-oriented services. Within this prevalent path, the capability to constantly generate intelligence about the customers' expressed needs in the primary activity chain and about how to satisfy these needs is essential to continuously create superior customer value (Slater and Narver, 2000).

An exception arising from the data analysis refers to service innovation around logistic services embedded in delivery spare and wear parts as well as consumables. These parts categories are necessary to operate the machines offered to the customers. Few companies innovated logistic services to provide consumables on a just-in-time and Kanban bases.

Additionally, the success of this path depended on whether companies could reconfigure their assets and resources to protect the spare parts business. Spare parts were argued to be the foundation of exploiting this path, because, on the one hand, they still remained relatively free from imitation and made it difficult for external service providers or competitors to provide repair, inspection and maintenance services for the installed base. On the other hand, after separating service and product businesses, the spare parts were an important component for bridging both businesses.

Thus, to protect their service business, companies concentrated on protecting their spare parts business from imitation. Typical routines referred to maximizing the ratio between manufactured and purchased parts, controlling the parts supply chains and optimizing parts logistics. In addition, we observed that companies reconfigured their technical assets to ensure remote access to the installed products for condition monitoring, potential authorized and non-authorized service activities as well as the replacement of original parts with copied parts.

Exploration of service opportunities

Altogether three companies could be identified as exploring service opportunities. Their service business development can be described through three distinct phases. The first and the last phase share similarities with the first and last phases of exploitation. Strong differences occur in the second phase. The resulting exploration phases can be described as:

(1) integrating the basic services into the product price;

(2) creating a new value constellation; and

(3) making use of the service expansion along the adjacent customer activity chain.

The second phase resembles a sudden, short burst that fundamentally alters the industry. Because of the various similarities in the first and third phases, our description concentrates mainly on the second phase and offers only short paragraphs on the first and third phases (Table IV).

Phase 1: integrating the basic services into the product price. In the first phase, companies employed similar sensing, seizing and reconfiguring capabilities as associated with exploitation. They formed an early dominant design by integrating basic services into the product price.

Phase 2: creating a new value constellation. Different to exploitation, the companies learned to consider the market structure endogenous as result from innovation and learning. Managers deliberately did not accept the service market as given, but rather emphasized the decomposition of market players and customer needs (Jaworski *et al.*, 2000). They were open to substitute the embedded theory-in-use for service markets with something fundamentally new through generative learning (Slater and Narver, 1995; Senge, 1990).

Relevant for companies' sensing activities was the fact that companies emphasized the capability to even create markets and new customer value opportunities, to drive the structure of the market or to shape market behavior. Companies were also aware of the tendency that within the primary customer activity chain, customer and competitor behavior as well as companies' past competitive behavior most probably functioned as successive hurdles for re-shaping market structure and service business development. Instead of sensing new service profit pools by charging for services separately which were initially integrated in the product price, sensing activities were opened up towards adjacent customer activity chains, new value constellations resulting from reconfiguring the whole value chains and beyond industry borders.

Routines and procedures supporting the extensive sensing were regular benchmarking and investigation of other industries, observing customers and non-customers and mapping comprehensively all related activities. In addition, investigating other industries and transferring those key insights required companies to master analogical thinking for

Table IV.
Dynamic capabilities for exploring service opportunities

	Phase 1: integrating basic services into the product price	Phase 2: creating a new value constellation	Phase 3: making use of the service expansion along the adjacent customer activity chain
Sensing capabilities	Identify service opportunities to differentiate total offering and which can be integrated into the product price Information-gathering routines to observe competitors' service offerings and behavior Information-gathering routines to observe obvious customer needs Fast and reliable information-processing capacity to prepare strategic response and quick reaction to competitors' service activities	Emphasis on capability to create markets and new customer value opportunities, to drive the structure of the market or shape market behavior Awareness that within the primary customer activity chain, customer and competitor behavior as well as companies' past competitive behavior most probably function as successive hurdles for re-shaping the market structure Sensing activities opened up towards adjacent customer activity chains and new value constellations beyond traditional value chain logic and industry borders Routines and procedures such as regular benchmarking and investigation of other industries, observing customers and mapping comprehensively the customer activities Master analogical thinking for problem solving to investigate other industries and transfer key insights	Information-gathering and information-processing routines to continuously generate intelligence about how to offer utility to customers' adjacent and primary activity chains
Seizing capabilities	Routines of quick and timely decisions to create a dominant design of the total offering	Service management with strategic vision of new value opportunities rather than establishing a dominant design, willing to take risks in exploration and empowered to drive strategy formulation	Capacity to serve and support customers' primary and adjacent activity chains and to formulate strategic responses

(*continued*)

Table IV.

	Phase 1: integrating basic services into the product price	Phase 2: creating a new value constellation	Phase 3: making use of the service expansion along the adjacent customer activity chain
	Capacity to form a dominant design (tactical choices on bundling and charging goods and services)	Sophisticated and disciplined approach to decision making under high uncertainty Formulate and articulate "umbrella strategies" for the new value constellations, i.e. provide only behavioral guidelines as boundaries and let strategy emerge within boundaries through trial-and-error processes Allow various scenarios to emerge within "umbrella" to deal with uncertainty High degrees of managerial flexibility and open-mindedness within strategy formulation to explore a broad range of different business opportunities Set up cross-functional team for exploration provided with sufficient resources and flexible time frames Entrepreneurial mindset of managers for exploration activities including visioning and risk-assessing skills to anticipate new value creation logic Risk management routines to incorporate remaining risks into billing model for the new business logic	Establish routines and procedures to stabilize the new value constellation Once the new value constellation is established, formulate "planned strategies" for service business development involving more rigid scenario planning Strategic vision that articulated strategies respond to the development of customer needs and competitors' offerings

(*continued*)

	Phase 1: integrating basic services into the product price	Phase 2: creating a new value constellation	Phase 3: making use of the service expansion along the adjacent customer activity chain
Reconfiguring capabilities	Capacity to redesign service processes and structures to achieve minimum operational costs (set up cost center in product organization) Procedures and routines to minimize service costs to achieve service profits embedded in product prices	Reconfigure internal organizational design factors to implement service strategies Reconfigure business relationships with external resources such as customer, suppliers and partners in the value-creating processes Integrate or re-integrate service and product activities within organizational structure Managerial belief that was customers buy and value is not a product or service but utility	Continuously adapt the operational capabilities to the new value constellation Reconfigure assets and resources to stubilize and protect the new business model

Table IV.

problem solving (Gavetti and Rivkin, 2005; Gavetti *et al.*, 2005, Reeves and Weisberg, 1994). For example, the tool care concept of the manufacturer of precision cutting tools was a transfer from embedding fixing and assembly materials including screws, screw accessories, dowels and plugs into comprehensive logistics services for small value, high volume parts and formed a new value constellation. The new value constellation allowed the cutting tool manufacturer to learn that the customers' handling costs exceeded the purchasing costs of the products. Of course, handling activities (storing, ordering, administering or controlling) were not part of the customers' primary activities of using the precision tools (using, repairing or maintaining), but were interpreted as offering attractive market potentials.

The cognition of these opportunities and the associated new value constellation is confronted with potential biases. For example, providing services for the adjacent customer activity chain can be far beyond a company's existing core competencies. It is also questionable to use the existing reputation as a proxy degree to evaluate the purchase probability of services addressing supplementary customer activities. Overcoming such biases requires a cognitively sophisticated and disciplined approach to decision making. Compared to exploitation, the decisions are less timely and quick. The operational procedures and routines do not focus on establishing a dominant design where services are charged for separately, but rather try to sense, seize and reconfigure new value constellations.

Owing to higher uncertainty in new value constellations, strategies were formulated and articulated as what Mintzberg and Waters (1985) called "umbrella strategies", i.e. general guidelines for behavior only defining the boundaries of the strategies. The boundaries were left open to primary and adjacent customer activity chains as well as potential value constellations downstream and upstream in the value chain. They even included to move from cooperation with customers to potential competition with existing customers or suppliers as well as to enter new industries and value chains.

Aware of the uncertainty that one scenario inherent in the "umbrella strategies" for the new value constellation might collapse, the exploration approach was based on allowing numerous scenarios to emerge. For example, the manufacturer of gearboxes for the automotive industry developed three scenarios for service business development. The first scenario included selling the gearbox to the commercial vehicle manufacturer, re-buying it from the user of the commercial vehicle and leasing it back to him. The leasing fee is a substitute for revenues and profits associated with aftermarket services around the gearbox and other components or systems. The second scenario included providing the commercial vehicle manufacturer with the gearbox for free, which thus remains property of the supplier, and focusing on a performance-based service-oriented business with the end-user. The third scenario was about establishing a center of competence for most vehicle components including products of other companies and progressively developing services for the whole commercial vehicle. Data confidentiality does not allow us to describe all options comprehensively; we rather concentrate on the major content.

The discussion of various scenarios was beneficial, because it facilitated managerial cognition of a broad range of different business opportunities. Throughout the strategy process the managers were observed to be more variable and flexible as well as more open to discuss new aspects of the service business. Of course, due to the fact that management attention and resources are limited, considering different scenarios could

lead to potential bottlenecks and time lags when it comes to the implementation. The companies exploring service opportunities avoided these bottlenecks by sufficient resources and realistic time frames. They even considered time not critical for the implementation of a new value constellation and allowed very flexible time schedules.

To successfully launch the exploration of service opportunities, internal procedures and activities required an entrepreneurial mindset and not a business manager's mindset as in the exploitation approach. Thus, managers with a strong entrepreneurial thinking guided the exploration activities. As entrepreneurs, strategy was not planned and executed, but rather emerged through trial-and-error processes within the potential scenarios and strategic avenues.

The innate uncertainty and novelty of exploration involves dealing with many risks, which has to be considered in the strategy formulation process. This requires specialized visioning and risk-assessing skills. For example, taking over the customer's tool management processes, as the power tool manufacturer did, means taking over all the responsibility and risks from the customer. The leasing model of the gearbox manufacturer needs comprehensive financial and legal skills, which represents an entirely new field of expertise. Additionally, despite developing different scenarios, there is still a large amount of risk involved in service business development. The remaining risk has to be incorporated into the new value constellation. Risk estimate and pricing form a key part of the scenario. However, even though exploring new service opportunities naturally involves serious risk management considerations and developing different scenarios may facilitate to face the uncertainty of exploration, managers are more willing to accept risks than in exploitation. Therefore, they need certain competences to foresee the value production logic of the changed business and to anticipate how the change would influence the roles of actors and their value-creating processes (Möller, 2006).

Reconfiguring a company's intangible and tangible assets also differs for both approaches. Besides reconfiguring internal organizational design factors to implement service strategies, exploration also involves reconfiguring the relationships with external resources such as customers, suppliers and partners in the value-creating processes.

Contradictory to the argument that separation of service and product business is important for getting momentum to extend service revenue and profitability, all three companies employing exploration still integrated their service and product activities. Rather than totally separating these activities, products and services are seen as essential components of service business development both forming the basis of the solutions offered.

Therefore, reconfiguring the organizational structure seemingly refers to integrating service and product activities, or even reintegrating them as the case may be. Managers following an exploration strategy did not see the risk to lose customers to more efficient core-value producers in the product or service business. The threat recognized by the managers was on thinking about markets in terms of the product and service offerings they sell and not on customer value. Managers believed that what customers buy and value is never a product or service but always utility from the product or service.

Phase 3: making use of the service expansion along the adjacent customer activity chain. After setting up the new value constellation in phase 2, the companies turned towards making use of the service expansion and reconfiguration along the adjacent customer activity chain. Dynamic capabilities are needed for stabilizing the new value

constellation. This is connected to changing the operational capabilities to benefit from the new value constellation.

Additionally, the necessary dynamic capabilities are similar to phase 3 of the exploitation approach. Thus, as a side effect, companies may be able to exploit the service opportunities within the primary customer activity chain by following the sequence of service extensions outlined in the exploitation approach. Space considerations do not permit us to repeat the sensing, seizing and reconfiguring capabilities. We simply illustrate them in Table IV along with phases 1 and 2.

Development of propositions

Based on the key evidences, we are able to formulate a set of interesting propositions. Whereas existing literature either suggests that the move towards service involves a radical change in strategy (Windahl, 2007) or raises the question "How should change take place (gradually or in leaps)?" (Oliva and Kallenberg, 2003, p. 162), companies favor the exploitation of service opportunities. Only few companies seem to employ an exploration strategy. This is counter-intuitive, because the service-oriented performance measures illustrated earlier would suggest that exploration is more successful in achieving attractive shares of service revenues. In addition, exploration seems to require elaborated sensing, seizing and reconfiguring capabilities. In contrast, exploitation is less interrelated with the sensing, seizing and reconfiguring capabilities. Future research could explore the two following propositions as well as the assumptions and consequences:

P1. Companies can either approach the service business through exploitation or exploration, but the majority of companies most likely chooses exploitation.

P2. Exploration requires more elaborated dynamic capabilities than exploitation.

Furthermore, service business development with its underlying sensing, seizing and reconfiguring capabilities is strongly embedded in the market orientation of companies. The type of market orientation functions as a discriminating factor between exploitation and exploration. It can be described as "market-driven" and "market-driving". Market-driven refers to exploitation because sensing and seizing capabilities indicate the acceptance of the market as given, while market-driving emphasizes proactive business logic which involves changing the composition of market players and indicates exploration (Jaworski *et al.*, 2000). Thus, we propose:

P3. The exploitation strategy corresponds with a reactive (market-driven) market orientation while the exploration strategy corresponds with a proactive (market-driving) market orientation.

Understanding in detail the various unanticipated side effects offers further promising propositions. The effect of separating the service from the product business for exploitation seems surprising. Certainly, the assumption to separate seems to be in line not only with respect to alternative business models, which are recommended to be spun off into a separate organization where path dependent constraints are less likely to exist (Christensen, 1997; Teece, 2007), but also with the literature on the transition from products to services (Oliva and Kallenberg, 2003; Auguste *et al.*, 2006). However, separating the service organization limits the exploration and sets up a path constraint towards exploitation. This tendency is even evident in the role of IBM's Global Service

Division, which is often referred to as a major driver of IBM's move towards service business. Despite its separations, IBM argues to emphasize integration activities through the "integration & values team" which is a group of 300 key leaders. These activities are corporate-wide strategic efforts (e.g. issues that require cross-organization interdependence). Another illustration is IBM's "On Demand Business" campaign which is about taking the next step by transforming IBM from a set of conventional silos (e.g. hardware, software and services) to an integrated structure oriented around providing solutions to customer needs (Harreld *et al.*, 2007).

When it comes to exploration, companies rethink their organizational structure to satisfy customer needs related to products and services. Exploration forces companies not to think about markets in terms of the product and service offerings they sell. They think what customers buy and value is never a product or service but always utility, that is, what a product and service does for the customers (Drucker, 1973; Sawhney *et al.*, 2004). Exploring new value constellations for customers are easier to address when companies put emphasis on the integration of products and services. Common themes around dynamic capabilities for exploration are most probably related to the argumentation in strategic and value innovation literature. Against this background, we offer the following proposition:

P4. An early separation of product and service business is likely to create momentum to increase service revenues and profits and leads to exploitation, but at the same time hinders exploration.

Another promising proposition arises from the role of cognition. The diversity of managerial cognition seems to be especially beneficial to develop the service business. Without critical reflection of the existing product-oriented business model, it is difficult to approach the service business. This line of reasoning can be substantiated with O'Reilly's and Tushman's (2008) argument on how IBM succeeds with dynamic capabilities and their quotation of IBM's former CEO, Lou Gerstner, who argued that under the old IBM "All of [our] capabilities were of a business model that had fallen wildly out of step with marketplace realities". Without adequate cognition and interpretation, IBM would not have been able to recognize that their capabilities were not in line with market demand and the competitive environment. Thus, cognitive diversity is essential to sense the need to develop the service business. For further research, we propose:

P5. The degree of cognitive diversity is most likely to facilitate a company's ability to explore and exploit new service opportunities.

The final proposition is related to the observation that a deliberately formulated and articulated strategy is associated with exploitation, while an emergent umbrella strategy is associated with exploration (Mintzberg and Waters, 1985). We argue that the umbrella strategy with the corresponding numerous scenarios and strategic avenues was beneficial, because it facilitated managerial cognition of a broad range of different business opportunities. Throughout the strategy process, the managers were more variable and flexible as well as more open to discuss new aspects of the service business. Facilitating managerial cognition through an umbrella strategy is most probably beneficial for exploration, but is less productive for exploitation and its underlying deliberate strategy:

P6. An early employment of a deliberate strategy is likely to be productive for exploitation, whereas an emergent umbrella strategy is more in line with exploration.

Conclusion

Theoretical implications

The research reveals that the strategic move towards services challenges the conventional ways of thinking in capital goods industry and requires dynamic capabilities (Matthyssens and Vandenbempt, 1998; Stremersch *et al.*, 2001). As set out in the introduction, we first identified a relation between dynamic capabilities and the way in which capital goods manufacturers develop the service business. As our findings indicate, coping with the challenge requires more than just operational capabilities to earn the expected service profits and revenues (Gebauer *et al.*, 2005; Oliva and Kallenberg, 2003). Dynamic capabilities are needed to guide the move towards a service-oriented business model. They are necessary for both approaches. Nevertheless, as discussed in *P2*, dynamic capabilities are more interrelated to exploration than exploitation.

Second, we identified common themes around sensing, seizing and reconfiguring capabilities for service business development via exploitation or exploration. The description of dynamic capabilities reveals insights that are neglected in the literature. Dynamic capabilities associated with the exploitation supplements existing knowledge on the transition line from products to services (Oliva and Kallenberg, 2003). The necessary dynamic capabilities for exploration extend existing theory and look beyond the existing assumptions (e.g. separating product and service business, concentrating on primary activity chains and so on). Additionally, knowledge from strategy literature is found useful in better addressing the service business in manufacturing companies.

Third, around the description, unanticipated yet interesting side effects for service business development appear in the role of separating the service business from the product business and the strong interdependence between temporal expansion and spatial reconfiguration in the service opportunity matrix, and the way for exploiting and exploration. The side effects can be linked with the literature on path dependence theory to explain the drivers of developments that cause the run of events (e.g. Schreyögg and Kliesch-Eberl, 2007; Sydow *et al.*, 2009). The side effects seem to create a history of the service organization, where the current approach of service business development is shaped by the patterns that evolved from the past side effects.

Fourth, considering the existing literature on case studies around exploitation and exploration reveals that our results add an important theoretical contribution. Case studies arising from the strategic management literature describe both exploitation and exploration and combine them through the construct named ambidexterity. The examination includes how exploration and exploitation can jointly influence firm performance (He and Wong, 2004). Whereas the research conducted in this field concentrates on the interaction between exploitation and exploration, our case is more suitable to study exploitation and exploration isolated from each other. Previous cases concentrating on service business development focus only on exploitation. The three cases on exploration add a signification contribution to the literature and suggest that service business development should also be investigated from the perspective of strategic and value innovation.

Finally, we explored six propositions for further research on exploitation and exploration of service opportunities.

Managerial implications

A number of managerial implications can be drawn from the findings. First, to make capital goods manufacturing more service-oriented, we have suggested that strategic changes are needed. The typical common themes for succeeding in the strategic change appear around sensing, seizing and reconfiguring activities associated with dynamic capabilities. In the shift towards services, the necessary sensing, seizing and reconfiguring activities presented in Tables III and IV can provide ideas for guiding manager on how the strategic change is influenced by dynamic capabilities.

Second, sensing, seizing and reconfiguring activities must be changed to facilitate a focus on service business. Information gathering and filtering activities must be, for example, in place to sense service business opportunities. Managers must persuade the establishment of strategic fit and set up an alignment between competitive environment, strategy and organizational design. As an example, companies need to consider the separation of product and service business to achieve the necessary strategic fit.

Third, by discussing the differences in dynamic capabilities for exploitation and exploration, we guide managers in finding the approach best suited for their companies. Companies more comforted with incremental strategic changes can focus on sensing, seizing and reconfiguring illustrated in Table III. Companies, which favor radical approaches, can concentrate on the issues illustrated in Table IV.

Fourth, the findings suggest what managers should be aware of the side effects created by setting up a separate strategic business unit for services and by formulating deliberate service strategies. It is important to understand that this separate business unit creates strong initial momentum by moving into the service business, but could be also in mid-term a limitation to explore business opportunities. When it comes to more integrated solutions spanning both primary and adjacent customer activity chain, managers might reconsider the initial separation and re-integrate product and service business. Besides the separation of the service business, the exploitation showed that companies had developed an array of new operational service competencies, but that rigidity in existing processes and management's inability to explore the service opportunities in the adjacent customer activity chain and new value constellation stopped them from successfully applying the exploration. In contrast, the findings on the exploration offer a detailed account of how the companies were able to form new value constellations. For both approaches, we identified management's ability to develop dynamic capabilities as a key for the service business development.

Limitations and future research

Although this study has its merits, it also has some limitations. First, since the study is based on case studies, the external validity (generalizability) could not be assessed accurately. The findings derive from limited site visits to 13 companies including various interviews. Inevitably, this can only provide a snapshot into such a complex phenomenon as dynamic capabilities for service business development. More detailed research is needed to reveal the experiences of capital goods manufacturers in this area. Thus, future research would benefit from insights obtained from additional qualitative

or quantitative data. In addition, as pointed out by Neu and Brown (2005), future research might also benefit from other sources, including customers or industry experts.

Second, our results show how dynamic capabilities enable the development of the service business in capital goods industries. Dynamic capabilities are believed to be a significant factor in service business development, but the dynamic capabilities investigated in this study are not meant to be exhaustive. They rather highlight potential strategic directions for future research.

Third, the distinction into exploitation and exploration does not capture ambidexterity, which is the ability of a firm to simultaneously exploit and explore. However, our distinction does not imply that companies should either focus on exploitation and exploration. We believe that company performance can benefit from ambidexterity in the long term. Our intention was merely to understand the approach to develop the service business and not company performance.

Finally, studying dynamic capabilities together with operational capabilities might be beneficial, but operational capabilities were considered to be beyond the scope of this study. Nevertheless, understanding how dynamic capabilities interact with operational capabilities and how they contribute to the success of the service business offers interesting future research opportunities.

References

Ashforth, B. and Lee, R.T. (1990), "Defensive behavior in organizations: a preliminary model", *Human Relations*, Vol. 43, pp. 621-48.

Auguste, B., Harmon, E. and Pandit, V. (2006), "The right service strategies for product companies", *McKinsey Quarterly*, Vol. 1, pp. 40-52.

Bowen, D.E., Siehl, C. and Schneider, B. (1989), "A framework for analyzing customer service orientations in manufacturing", *Academy of Management Review*, Vol. 14 No. 1, pp. 75-95.

Brax, S. (2005), "A manufacturer becoming service provider – challenges and a paradox", *Managing Service Quality*, Vol. 15 No. 2, pp. 142-55.

Brown, S., Gustafsson, A. and Witell, L. (2009), "Beyond products", *Wall Street Journal/MIT Sloan*, 22 June.

Cepeda, G. and Vera, D. (2007), "Dynamic capabilities and operational capabilities: a knowledge management perspective", *Journal of Business Research*, Vol. 60, pp. 426-37.

Christensen, C. (1997), *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail*, Harvard Business School Press, Cambridge, MA.

Cohen, M., Agrawal, N. and Agrawal, V. (2006), "Winning in the aftermarket", *Harvard Business Review*, Vol. 84 No. 5, pp. 129-38.

Davies, A. (2003), "Are firms moving 'downstream' into high-value services?", in Tidd, J. and Hull, F.M. (Eds), *Service innovation, Series on Technology Management*, Imperial College Press, London, Vol. 9, pp. 21-34.

Davies, A. (2004), "Moving base into high-value integrated solutions: a value stream approach", *Industrial and Corporate Change*, Vol. 13 No. 5, pp. 727-56.

Davies, A., Brady, T. and Hobday, M. (2007), "Organizing for solutions: systems seller vs. systems integrator", *Industrial Marketing Management*, Vol. 36 No. 2, pp. 183-93.

Dierickx, I. and Cool, K. (1989), "Asset stock accumulation and the sustainability of competitive advantage", *Management Science*, Vol. 35 No. 12, pp. 1504-11.

Dilk, C., Gleich, R., Kochen, J.C. and Staiger, T. (2008), *Wachstumspotenziale im Maschinenbau*, VDMA-Verlag, Frankfurt am Main.

Drucker, P.F. (1973), *Management: Tasks, Responsibilities, Practices*, Harper & Row, New York, NY.

Drumwright, M.E. (1994), "Socially responsible organizational buying: environmental concern as a noneconomic buying criterion", *Journal of Marketing*, Vol. 58 No. 3, pp. 1-19.

Einhorn, H.J. and Hogarth, H.M. (1986), "Behavioural decision theory: process of judgment and choice", *Annual Review of Psychology*, Vol. 32, pp. 53-88.

Eisenhardt, K.M. (1989), "Building theories from case study research", *Academy of Management Review*, Vol. 14 No. 4, pp. 532-50.

Eisenhardt, K.M. and Martin, J.A. (2000), "Dynamic capabilities: what are they?", *Strategic Management Journal*, Vol. 21, pp. 1105-21.

Galbraith, J.R. (2002), "Organizing to deliver solutions", *Organizational Dynamics*, Vol. 31 No. 2, pp. 194-207.

Gavetti, G. and Rivkin, J.W. (2005), "How strategists really think", *Harvard Business Review*, Vol. 83, pp. 54-63.

Gavetti, G., Levinthal, D.A. and Rivkin, J.W. (2005), "Strategy making in novel and complex worlds: the power of analogy", *Strategic Management Journal*, Vol. 26, pp. 691-712.

Gebauer, H. (2008), "Identifying service strategies in product manufacturing companies by exploring environment – strategy configurations", *Industrial Marketing Management*, Vol. 37 No. 3, pp. 278-91.

Gebauer, H. and Fleisch, E. (2007), "An investigation of the relationship between behavioral processes, motivation, investments in the service business and service revenue", *Industrial Marketing Management*, Vol. 36 No. 3, pp. 337-48.

Gebauer, H., Fischer, T. and Fleisch, E. (2010a), "Exploring the interrelationship among patterns of service strategy changes and organizational design elements", *Journal of Service Management*, Vol. 21 No. 1, pp. 103-29.

Gebauer, H., Fleisch, E. and Friedli, T. (2005), "Overcoming the service paradox in manufacturing companies", *European Management Journal*, Vol. 23 No. 1, pp. 14-26.

Gebauer, H., Friedli, T. and Fleisch, E. (2006), "Success factor for achieving high service revenues in manufacturing companies", *Benchmarking: An International Journal*, Vol. 13 No. 3, pp. 374-86.

Gebauer, H., Edvardsson, B., Gustafsson, A. and Witell, L. (2010b), "Match or mismatch: strategy-structure configurations in the service business of manufacturing companies", *Journal of Service Research*, Vol. 13 No. 2, pp. 198-215.

Gebauer, H., Pütz, F., Fischer, T. and Fleisch, E. (2009), "Service orientation of organizational structures", *Journal of Relationship Marketing*, Vol. 8 No. 2, pp. 103-26.

Gilly, M.C. and Wolfinbarger, M. (1998), "Advertising's internal audience", *Journal of Marketing*, Vol. 62 No. 1, pp. 69-88.

Harreld, B., O'Reilly, C. and Tushman, M. (2007), "Dynamic capabilities at IBM: driving strategy into action", *California Management Review*, Vol. 49 No. 4, pp. 21-43.

He, Z. and Wong, P. (2004), "Exploration vs. exploitation: an empirical test of the ambidexterity hypothesis", *Organization Science*, Vol. 15 No. 4, pp. 481-94.

Helfat, C.E. (1997), "Know-how and asset complementarity and dynamic capability accumulation: the case of R&D", *Strategic Management Journal*, Vol. 18, pp. 339-60.

Helfat, C.E., Finkelstein, S., Mitchell, W., Peteraf, M.A., Singh, H., Teece, D.J. and Winter, S.G. (2007), *Dynamic Capabilities: Understanding Strategic Change in Organizations*, Blackwell, London.

Homburg, C., Fassnacht, M. and Guenther, C. (2003), "The role of soft factors in implementing a service-oriented strategy in industrial marketing companies", *Journal of Business-to-Business Marketing*, Vol. 10 No. 2, pp. 23-51.

Homburg, C., Hoyer, W. and Fassnacht, M. (2002), "Service orientation of a retailer's business strategy: dimensions, antecedents, and performance outcomes", *Journal of Marketing*, Vol. 66 No. 4, pp. 86-101.

Jaworski, B., Kohli, A. and Sahay, A. (2000), "Market-driven versus driving markets", *Journal of the Academy of Marketing Science*, Vol. 28 No. 1, pp. 45-54.

Johnstone, S., Dainty, A. and Wilkinson, A. (2008), "In search of 'product-service': evidence from aerospace, construction, and engineering", *The Service Industries Journal*, Vol. 26 No. 6, pp. 1-14.

Kahneman, D., Slovic, P. and Tversky, A. (1982), *Judgement Under Uncertainty: Heuristics and Biases*, Cambridge University Press, Cambridge, MA.

Kindström, D., Kowalkowski, C. and Sandberg, E. (2009), "A dynamic capabilities approach to service infusion in manufacturing", in Stauss, B., Brown, S.W., Edvardsson, B. and Johnston, R. (Eds), *QUIS 11: Moving Forward with Service Quality*, Ingolstadt School of Management, Wolfsburg, pp. 331-40.

Kohli, A.K. and Jaworski, B.J. (1990), "Market orientation: the construct, research propositions and managerial implications", *Journal of Marketing*, Vol. 54, April, pp. 1-18.

Kotler, P. (1994), *Marketing Management: Analysis, Planning, Implementation and Control*, 8th ed., Prentice-Hall, Englewood Cliffs, NJ.

Leonard-Barton, D. (1992), "Core capabilities and core rigidities: a paradox in managing new product development", *Strategic Management Journal*, Vol. 13, pp. 111-25 (summer special issue).

Malleret, V. (2006), "Value creation through service offers", *European Management Journal*, Vol. 24 No. 1, pp. 106-16.

March, J.G. (1991), "Exploration and exploitation in organizational learning", *Organizational Science*, Vol. 2 No. 1, pp. 71-87.

Martin, C.R. Jr and Horne, D.A. (1992), "Restructuring towards a service orientation: the strategic challenges", *International Journal of Service Industry Management*, Vol. 3 No. 1, pp. 25-38.

Mathieu, V. (2001), "Service strategies within the manufacturing sector: benefits, costs and partnership", *International Journal of Service Industry Management*, Vol. 12 No. 5, pp. 451-75.

Matthyssens, P. and Vandenbempt, K. (1998), "Creating competition advantage in industrial services", *Journal of Business & Industrial Marketing*, Vol. 13 Nos 4/5, pp. 339-55.

Matthyssens, P. and Vandenbempt, K. (2008), "Moving from basic offerings to value-added solutions: strategies, barriers and alignment", *Industrial Marketing Management*, Vol. 37 No. 3, pp. 316-28.

Meiren, T. (2006), *Service Engineering im Trend*, Fraunhofer IRB Verlag, Stuttgart.

Miles, M.B. and Huberman, A.M. (1994), *Qualitative Data Analysis: An Expanded Sourcebook*, 2nd ed., Sage, Thousand Oaks, CA.

Mintzberg, H. (1973), "Strategy making in three modes", *California Management Review*, Vol. 16 No. 2, pp. 44-53.

Mintzberg, H. (1978), "Patterns in strategy formation", *Management Science*, Vol. 24 No. 9, pp. 934-48.

Mintzberg, H. and Waters, J. (1985), "Of strategies, deliberate and emergent", *Strategic Management Journal*, Vol. 6 No. 3, pp. 257-72.

Mintzberg, H. and Westley, F. (1992), "Cycles of organizational change", *Strategic Management Journal*, Vol. 13, pp. 39-59.

Möller, K. (2006), "Role of competences in creating customer value: a value-creation logic approach", *Industrial Marketing Management*, Vol. 35 No. 8, pp. 913-24.

Neu, W.A. and Brown, S.W. (2005), "Forming successful business-to-business services in goods-dominant firms", *Journal of Service Research*, Vol. 8 No. 1, pp. 3-17.

Neu, W.A. and Brown, S.W. (2008), "Manufacturers forming successful complex business services: designing an organization to fit the market", *International Journal of Service Industry Management*, Vol. 19 No. 2, pp. 232-51.

Noch, R. (1995), *Dienstleistungen im Investitionsgüter-Marketing – Strategien und Umsetzung*, FGM, München.

Oliva, R. and Kallenberg, R. (2003), "Managing the transition from products to services", *International Journal of Service Industry Management*, Vol. 14 No. 2, pp. 160-72.

O'Reilly, C.A. and Tushman, M.L. (2008), "Ambidexterity as a dynamic capability: resolving the innovator's dilemma", *Research in Organizational Behavior*, Vol. 28, pp. 185-206.

Paiola, M., Gebauer, H. and Edvardsson, B. (2009), "Service infusion in manufacturing: the case of small and medium enterprises", in Stauss, B., Brown, S.W., Edvardsson, B. and Johnston, R. (Eds), *QUIS 11 – Moving Forward with Service Quality*, Ingolstadt School of Management, Wolfsburg, pp. 480-9.

Potts, G.W. (1988), "Exploiting your product's life cycle", *Harvard Business Review*, Vol. 66 No. 5, pp. 32-5.

Prahalad, C.K. and Hamel, G. (1990), "The core competence of the corporation", *Harvard Business Review*, May/June, pp. 79-91.

Reeves, L.M. and Weisberg, R.W. (1994), "The role of content and abstract information in analogical transfer", *Psychological Bulletin*, Vol. 115, pp. 381-400.

Reinartz, W. and Ulaga, W. (2008), "How to sell services more profitably", *Harvard Business Review*, Vol. 86 No. 5, pp. 90-6.

Sawhney, M., Balasubramanian, S. and Krishan, V. (2004), "Creating growth with services", *Sloan Management Review*, Vol. 45, pp. 34-43.

Schreyögg, G. and Kliesch-Eberl, M. (2007), "How dynamic can organizational capabilities be? Towards a dual-process model of capability dynamization", *Strategic Management Journal*, Vol. 28 No. 9, pp. 913-33.

Senge, P. (1990), *The Fifth Discipline: The Art and Practice of the Learning Organization*, Doubleday Currency, New York, NY.

Shah, D., Rust, R.T., Parasuraman, A., Staelin, R. and Day, G.S. (2006), "The path to customer centricity", *Journal of Service Research*, Vol. 9 No. 2, pp. 113-24.

Simon, H. (1993), *Industrielle Dienstleistungen*, Schäffer-Poeschel, Stuttgart.

Slater, S.F. and Narver, J.C. (1995), "Market orientation and the learning organization", *Journal of Marketing*, Vol. 59 No. 3, pp. 63-74.

Slater, S.F. and Narver, J.C. (2000), "Intelligence generation and superior customer value", *Journal of the Academy of Marketing Science*, Vol. 28 No. 1, pp. 120-7.

Strauss, A.L. and Corbin, J.M. (1998), *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory*, Sage, Thousand Oaks, CA.

Stremersch, S., Wuyts, S. and Frambach, R.T. (2001), "The purchasing of full-service contracts: an exploratory study within the industrial maintenance market", *Industrial Marketing Management*, Vol. 30 No. 1, pp. 1-12.

Sydow, J., Schreyögg, G. and Koch, J. (2009), "Organizational path dependence: opening the black box", *Academy of Management Review*, Vol. 34 No. 4, pp. 689-709.

Tallman, S. (2003), "Dynamic capabilities", in Faulkner, D.O. and Campbell, A. (Eds), *The Oxford Handbook of Strategy: A Strategy Overview and Competitive Advantage*, Vol. 1, Oxford University Press, Oxford.

Teece, D.J. (2007), "Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance", *Strategic Management Journal*, Vol. 28 No. 13, pp. 1319-50.

Teece, D.J., Pisano, G. and Shuen, A. (1997), "Dynamic capabilities and strategic management", *Strategic Management Journal*, Vol. 18 No. 7, pp. 509-33.

Vandermerwe, S. and Rada, J. (1988), "Servitization of business: adding value by adding services", *European Management Journal*, Vol. 6 No. 4, pp. 314-24.

VDMA (2005), *So klingt der Erfolg – Preisstrategien für Ersatzteile und Serviceverträge*, VDMA-Verlag, Frankfurt am Main.

Wernerfelt, B. (1984), "A resource-based view of the firm", *Strategic Management Journal*, Vol. 5 No. 2, pp. 171-80.

Windahl, C. (2007), *Integrated Solutions in the Capital Goods Sector: Exploring Innovation, Service and Network Perspectives*, LiU-Tryck, Linköping.

Windahl, C., Andersson, P., Berggren, C. and Nehler, C. (2004), "Manufacturing firms and integrated solutions: characteristics and implications", *European Journal of Innovation Management*, Vol. 7 No. 3, pp. 218-28.

Winter, S.G. (2003), "Understanding dynamic capabilities", *Strategic Management Journal*, Vol. 24 No. 10, pp. 991-6.

Wise, R. and Baumgartner, P. (1999), "Go downstream: the new imperative in manufacturing", *Harvard Business Review*, Vol. 77 No. 5, pp. 133-41.

Yin, R.K. (1994), *Case Study Research: Design and Methods*, 2nd ed., Sage, London.

Zahra, S.A. and George, G. (2002), "Absorptive capacity: a review, reconceptualization, and extension", *Academy of Management Review*, Vol. 27 No. 2, pp. 185-203.

Further reading

Grönroos, C. (1990), *Service Management and Marketing: Managing the Moments of Truth in Service Competition*, Lexington Books, Lexington, MA.

Simon, H. (1992), "Service policies of German manufacturers: critical factors in international competition", *European Management Journal*, Vol. 10 No. 4, pp. 404-11.

Teece, D.J. (1986), "Profiting from technological innovation", *Research Policy*, Vol. 15 No. 6, pp. 285-305.

Corresponding author

Heiko Gebauer can be contacted at: heiko.gebauer@unisg.ch

To purchase reprints of this article please e-mail: **reprints@emeraldinsight.com**
Or visit our web site for further details: **www.emeraldinsight.com/reprints**