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Identifying service strategies in product manufacturing companies by exploring environment–strategy configurations

Heiko Gebauer *

University of St. Gallen, Switzerland

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Abstract

Higher market complexity and increasing competitive intensity are forcing traditional product-manufacturing companies to change their position in the goods–services continuum by continuously extending the service business. However, the existing literature tends to be somewhat vague in defining service strategies for manufacturing companies wishing to move along the continuum. The purpose of this study is to identify service strategies that correspond with specific environment–strategy fits. Using an exploratory factor and cluster analysis for testing Western European firms, the study highlights four different service strategies. The four service strategies include after-sales service providers (ASPs), customer support providers (CSPs), outsourcing partners (OPs), and development partners (DPs). After-sales service providers concentrate on cost leadership and ensure proper functioning of the product. Customer support providers form a unique value proposition by investing in a strong product and service differentiation. Outsourcing partners combine cost leadership with service and product differentiation to offer attractive prices for operational services. Their goal is to assume the operating risk and full responsibility for the customer's operating processes. Development partners provide research and development services to create a situation in which customers benefit directly from their development competencies.

Keywords: External environment; Environment–strategy configurations; Service strategy; Product-manufacturing companies

1. Introduction

Increasingly, more comprehensive customer needs, higher competitive intensity, and the need to exploit new growth potential force Western European product-manufacturing firms to extend their service business (Anderson, Fornell, & Rust, 1997). Increasing competitive intensity with a corresponding erosion of product margins refers to the fact that achieving product differentiation is currently in a stage of maturity. In the machine and equipment-manufacturing industry, for example, product margins have dropped to no more than 1 or 2% over the last couple of years. In contrast, typical after-sales services such as repair, spare parts, or maintenance offer margins of more than 10% (Cohen, Agrawal, & Agrawal, 2006). Faced with stagnating product sales, services also offer additional growth potential. Sawhney, Balasubramanian, and Krishnan (2004) indicate that considerable growth potential is manifest in both the primary customer activity chains and comprehensive or adjacent customer activity chains. This growth potential can be exploited either by adding *new* activities to a primary or adjacent activity chain or *reconfiguring* the structure and control of activities within the primary or adjacent activity chain. According to Wise and Baumgartner (1999), such potential in the field of service revenue often exceeds three or four times the magnitude of annual product revenue. On the customer side, pressure to downsize so as to create more flexible firms, use narrower definitions of core competencies, and increase technological complexity are driving forces behind the rise of service outsourcing. Additionally, customers wish to reduce the capital employed in their production sites. Instead of investing in an air compressor, for example, they want an "opportunity" to pay for xm^3 of compressed air (Windahl, Andersson, Berggren, & Nehler, 2004).

Anecdotal evidence on the extension of the service business and the corresponding service infusion in manufacturing firms can be found in Jack Welch's statement that "the [service]

* Tel.: +41 71 224 72 40.
E-mail address: heiko.gebauer@unisg.ch.

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market is bigger than we ever dreamt" (Slater, 1999, p. 183), SIEMENS' goal to generate 50% of total revenue through services (Simon, 1993), and IBM's success in mutating itself from a pure mainframe manufacturer toward an outstanding service provider. Oliva and Kallenberg (2003) conceptualize the extension of service business through the transition line and/or the goods–services continuum. At the one extreme point of the continuum, firms achieve a competitive position as a product manufacturer. They produce essentially core products, with services purely as add-ons. Profits and revenue are generated mainly through the company's core products and the contribution of services is quite low in terms of revenue, profit, and customer satisfaction. Services are only one of the main differentiating factors in the product-marketing strategy. At the other extreme point, products are merely an add-on to the services. Products represent only a small part of total value creation. The dominant share of total value creation stems from services.

Moving along the transition line creates additional competitive advantage for product-manufacturing companies, leading to a different competitive positioning. Although such positioning has been discussed extensively in the literature, and formed the basis of numerous classification schemes (Porter, 1980; Galbraith & Schendel, 1983; Robinson & Pearce, 1988), existing research remains silent with respect to various service strategies needed to move into a new position on the transition line. Common patterns of competitive positioning have included, among others, overall cost leadership, product differentiation, marketing differentiation, and focus (Kim & Lim, 1988). However, such patterns do not fully capture the extension of the service business as a response to decreasing product margins and changing customer expectations within Western Europe's manufacturing industry. Morrison and Roth (1992), for example, argue that customer service is a typical dimension of the quality reputation of manufacturing firms. However, current service offerings in typical manufacturing companies do not only capture customer service. According to Oliva and Kallenberg (2003), service offerings also include services for the installed base, process-oriented services, professional services, and operational services. This extended breadth of service offering has not been included in the debate on service strategies in manufacturing companies.

Neu and Brown (2005, p. 5) argue that "firms that successfully develop B2B service will align strategy with conditions of the service business unit's external environment and adapt several factors of organization to align with the newly formed [service] strategy". That means organizational performance of manufacturing companies moving along the transition line depends on the proper alignment between environment, strategy, and factors in organizational design. The present study concentrates on explaining specific environment–strategy configurations to explore service strategies in manufacturing companies. It focuses on the following research questions:

- What strategy–environment configurations exist in the manufacturing industry?
- What service strategies can be identified with respect to these strategy–environment configurations?
- What performance level can be achieved through a service strategy?

2. Conceptual framework

2.1. Research on strategy–environment fit

In developing the framework, this study draws on research in the area of strategy–environment fit. This research addresses how strategy and external environment influence each other. According to contingency theory, for example, organizational performance depends partly on the strategy–environment fit (Mintzberg, 1979). Organizational theory has established several dimensions of environmental characteristics: uncertainty, directness, change, dynamism, homogeneity, complexity, and munificence (Aldrich, 1979; Andrews, 1996; Duncan, 1972]. Research on the external environment started with Dess and Beard's discussion (1984) of the various dimensions of organizational task environments. They distinguish between the following three factors characterizing the external environment: munificence, complexity, and dynamism. Munificence relates to the scarceness of environmental resources that support firms' growth within a given industry. Environmental complexity reflects the heterogeneity and concentration of environmental elements. Environmental dynamism refers to the rate of change and degree of instability of the environment. Rapid change, short product life cycles, and processes of creative destruction are typical characteristics of dynamic environments. Dynamic environments make current products and services obsolete, and require new competences to be developed (Dess & Beard, 1984). Miller (1987) uses the term *environmental competitiveness* to reflect the number of competitors, and of areas in which there is competition. Jaworski and Kohli (1993) use the term *competitive intensity,* which reflects the behavior, resources, and ability of competitors to differentiate their products or services. The market orientation view argues that organizational activities are not only influenced by competitors, but also by market turbulence in terms of changing customer product preferences. Kohli and Jaworski (1990), for example, propose a philosophy that directs firms' activities toward understanding changing customer preferences and designing a strategy to satisfy those needs.

Strategy research has typically concentrated on exploring different strategy taxonomies. Starting with Porter's (1980) classification of cost leadership, differentiation, and focus strategy, the existing literature provides a broad range of taxonomies. Kim and Lim (1988), for example, specify Porter's model by distinguishing between product and marketing differentiations. Miller and Roth (1994) differentiate between various types of manufacturing strategies. Their taxonomy includes caretakers, marketers, and innovators. These strategies differ in their potential for creating competitive advantages such as low price, design flexibility, volume flexibility, speed, after-sales service, etc. Interestingly, after-sales service plays a critical role for marketers and innovators, but not for caretakers. Morrison and Roth (1992) argue that strategies for competition in global industries can be clustered into domestic product specialization,

exporting high-quality offerings, international product innovation, and quasi global combination. Customer service is that part of quality reputation, which represents critical competitive factors for exporting high-quality offerings. In other words, customer service supports firms in augmenting their product offering, facilitating sales at the general level (Kyi & Kyi, 1989; Lovelock, 1994), and increasing the general quality of interaction between the buyer and seller (Parasuraman, 1998).

Research on service strategies stresses that the sources of competitive advantages can differ between the service and manufacturing industries (Bharadwaj, Varadarajan, & Fahy, 1993; Bowen & Ford, 2002; Matthyssens & Vandenbempt, 1998; Thomas, 1978). Nevertheless, the taxonomies on service strategies are quite similar to those on manufacturing strategies. Lovelock (1994) argues that strategies in the service sector can be also divided into those relating to differentiation, costs, or focus. Researchers in the field of service management concentrate more on explaining how types of services differ in their impact on marketing strategy (Lovelock, 1983). Bowen (1990) develops a taxonomy of services for gaining strategic marketing insights. In the field of industrial services, Boyt and Harvey (1997) distinguish between three service categories: elementary, intermediate, and intricate. Elementary services are related to products that are purchased frequently and not essential to the industrial customers' primary functions. Intermediate services require a more elaborate set of service components. Typical examples of intermediate services are equipment repair, leasing, or transportation. Intricate services require the most intensive service level and customer attention. This category of services, for example, consulting, design, and so on reflects high levels of credence properties, requires personal delivery, is highly complex, and has a low replacement rate. The three service categories require different promotional and pricing strategies.

2.2. Fit as gestalts as a concept of fit in strategy research

In general, research addressing the issue on strategic fit can be classified into six perspectives: fit as moderation, fit as mediation, fit as matching, fit as gestalts, fit as profile deviations, and fit as covariation (Venkatraman, 1989; Venkatraman & Camillus, 1984). Each perspective differs in the key characteristics such as the underlying conceptualization of fit, verbalization of strategy proposition, analytical schemes for testing fit, and so on. The fit as moderation, for example, assumes that strategic fit will lead to an interaction effect of strategy and environmental characteristics that has implications for performance. Analytical schemes for testing fit include structural equation modeling (SEM) or moderated regression analysis. The perspective of the strategy fit in this present paper is most similar to *fit as gestalts*. The underlying conceptualization of fit is internal congruence. It means that the nature of internal congruence among the set of environmental and strategic variables differs for "high" and "low" performance business. Fit as gestalts requires cluster analysis as analytical approaches for testing fit (Venkatraman, 1989). Illustrative references that guided the present research effort refer, for instance, to Miller and Friesen (1984), Hambrick (1984), and Morrison and Roth (1992).

Descriptive and predictive validity are the major analytical issues in the context of regarding fit as gestalts (Venkatraman, 1989). To improve the descriptive validity of the resulting environment–strategy configurations, the selection of the input variables should be guided by theory. Predictive validity is important for establishing the performance implications of the environment–strategy configurations, and for demonstrating the positive effect of the service strategies on the company performance.

2.3. Framework

Fig. 1 presents the conceptual framework on which the research is based. The framework combines the outlined research on external environment and strategies. The business environment is conceptualized through the following underlying constructs: competitive intensity in the product fields, competitive intensity in the service field, market growth, price sensitivity of customers, and strategic choices of customers. The first two derive directly from the literature on market orientation. Market growth and price sensitivity of customers reflect the two aspects of market turbulence, a traditional dimension of the business environment (Jaworski & Kohli, 1993). Market growth refers to the growth rate of total sales in a business unit's principal market segment. A high market growth in the product field denotes a more favorable environment for manufacturing companies (Slater & Narver, 1994). Price sensitivity captures customer attitudes toward prices (Janiszewski & Lichtenstein, 1999). Market turbulence, as operationalized by Jaworski and Kohli (1993), also covers the changing customer product preferences. In this context, customer product preferences are interpreted as changes in strategic choices on how to operate the

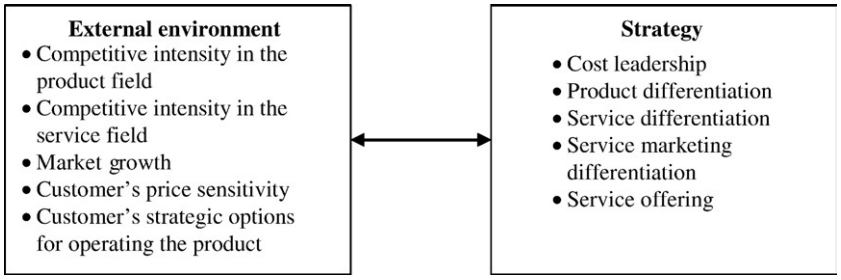

Fig. 1. Conceptual framework.

products. Outsourcing the product maintenance represents such a strategic option. Other strategic options refer to ensuring only proper product functioning or optimizing the efficiency and effectiveness of the product within the customer process. Customers following different strategic options probably have different customer needs.

From the perspective of strategies in manufacturing companies, the conceptualization of strategy focuses on constructs that are needed for formulating a strategy. Key service strategy factors typically involve the actual service offering and competitive positioning (Homburg, Fassnacht, & Guenther, 2003). Competitive positional advantage can be construed broadly as cost leadership and differentiation advantages. The latter entails customers perceiving a consistent difference in important attributes between a firm's business activities and those of its competitors. In this context, three sources of differentiation advantages are captured: product differentiation, service differentiation, and service marketing differentiation. Product and service differentiation are well documented in Porter's generic strategy alternatives (Porter, 1980). The use of a service marketing differentiation is consistent with Miller's (1987) findings that the differentiation strategy has two variations: product and marketing differentiation. Additionally, Homburg et al. (2003) argued recently that to achieve a more effective service orientation within the corporate strategy, it is important to examine the emphasis placed on services. This emphasis relates to the degree to which a company actively offers services to its customers. In this context, the emphasis on service offers is conceptualized as a *service marketing differentiation*.

The service offering itself is clearly an important facet of a service strategy (Homburg et al., 2003). Both the type and breadth of services a manufacturing company offers undoubtedly influence the ability to augment the core product offering. This is similar to the product type and breadth of product range, which are considered to constitute key strategic decisions in the field of product management (Lehmann & Winer, 1997). The literature offers little conceptualization of service offerings as a key dimension in the service strategy at the corporate level. Services in manufacturing companies are far from homogeneous, and differ substantially in their ability to achieve a differentiation. For instance, Simon (1992) considers that services, which directly enhance the value of the product, are more effective in creating competitive advantages than services of a more general nature. However, the existing literature concentrates mainly on the impact of different service types on promotional, marketing, and pricing strategy (Bowen, 1990; Bowen, Siehl, & Schneider, 1989; Boyt & Harvey, 1997; Lovelock, 1994). Only Homburg et al. (2003) offer a conceptualization of the service offerings. The service orientation of a strategy is conceptualized in two dimensions: (1) the number of services offered, and (2) how strongly these services are emphasized to customers. The latter is already included in the conceptualization of the service marketing differentiation. For that reason, the framework reflects different types of services, including presales, sales, and aftersales services, as well as services for the installed base, process-oriented services, professional services, and operational services (Oliva & Kallenberg, 2003).

3. Research methodology

3.1. Data sample

To identify service strategies by exploring the strategy–environment configurations, data was obtained from Western European manufacturing companies in business-to-business markets. The products of the participating companies require a high level of investment on the part of customers. Because of data confidentiality, the real names of the participating companies are not revealed. However, the study includes well-known international companies such as ABB, BOSCH, COMAU, ERICSSON, HILTI, ROCHE DIAGNOSTICS, SCHINDLER, SIEMENS, and TETRA PAK. Additionally, "hidden champions" such as AGIE CHARMILLES, BERTRAMS, BYSTRONIC, CRYPTO, ELCOTEQ, FESTO, FRAISA, KÖRBER, NEXANS, RIETER, SAURER, TRUMPF, UNAXIS or ZUMTOBEL were also included. The unit of analysis was a strategic business unit (SBU). This level was selected, because different SBUs within one manufacturing firm can pursue a number of different strategies (Govindarajan, 1989), and can differ from corporate strategy in terms of competitive positioning (Gupta & Govindarajan, 1984). Nevertheless, the various taxonomies of competitive positioning can be also applied to the level of business units (Kotha & Orne, 1989; Morrison & Roth, 1992). In this context, it is assumed that different SBUs within one manufacturing firm can follow a number of different service strategies. All investigated SBUs seek to position themselves in the goods–service continuum and reflect specific environment–strategy configurations.

Based on interviews with experts from different manufacturing industries, the sample was divided into SBUs that were highly successful in their alignment between environment and strategy, leading to overall profitability (operating margins) of more than 5% in the last three years, and SBUs that were less successful. The level of 5% was selected because it represents the average margin in Western European manufacturing industries. Altogether, 108 SBUs achieving an operating margin of more than 5% and 87 SBUs achieving less than 5% participated in the study. In total, 195 SBUs were investigated by interviewing executive managers in each SBU. In general, small, medium, and large SBUs are included (less than 100 employees = 39 SBUs; 100 to 249 employees = 73 SBUs; 250 to 999 employees = 74 SBUs; more than 1000 employees = 9 SBUs) and so are different product categories [machine and equipment manufacturing companies (28.6%), measuring, analyzing, and controlling instruments (17.5%), electronic and other electrical equipment and components (38.7%), and others (5.2%)]. The entire study started in 2004 and ended in spring 2007.

Because of the concerns expressed in previous research about using key informants (Phillips, 1981), a two-step approach was conducted to ensure the quality of information obtained. First, each interviewee was contacted personally through telephone to verify that he/she was knowledgeable about the subject being studied or could identify another more suitable person in the organization. Second, three questions were used to check the quality of information provided by the

respondents (Kumar, Stern, & Anderson, 1993). The questions assess the informant's knowledge of key aspects of the service business. Respondents were first asked to indicate the amount of time they had spent in the company, how knowledgeable they were about the intended goals and purposes of environment–strategy configurations; then, they were asked to assess the extent of their work experience in the service organization. The last two items were measured on a three-point scale anchored by "low knowledge" and "high knowledge". The respondents averaged 10.14 (std. deviation = 4.87) years of employment with their firm, thus indicating an adequate amount of experience and knowledge of the key informants for the purposes of the study. The mean responses to the last two items were 2.72 (std. deviation = 0.80 and 2.23 (std. deviation = 0.53). It seems reasonable to assume that the respondents had considerable expertise. Key informant bias is therefore not an issue in this study.

3.2. Data collection

Data was collected by means of a questionnaire that was used as part of face-to-face interviews. The interviews were conducted through the author and an assisting team of PhD students. The questionnaire consisted of two types of questions. A subset of unstructured questions allowed interviewees to explain various characteristics of the external environment, service strategies, and performance indicators. The structured questions took the form of a typical questionnaire and reflected the conceptual framework. Interviews typically ranged from 60 to 90 min with about one-third of the time being devoted to the unstructured questions, and the remaining time to the structured questions.

3.3. Data analysis

Because external environment, strategy, and service-related performance outcomes may vary by size of SBUs and the product category, the data analysis started with a *t*-test for comparing the various sizes and groups of product categories. No significant item differences ($p < 0.05$) existed either among the four categories on SBU size, or among the four product categories.

Cluster analysis was used to analyze the data (Ketchen & Shook, 1996). In the context of strategy research, cluster analysis can provide descriptions of configurations of variables representative of manufacturing, financial, and market strategies as well as of environmental characteristics. However, the use of cluster analysis in strategic management research has been the object of frequent criticism (Ketchen & Shook, 1996). For instance, researchers using cluster analysis have to be aware that its sorting ability is powerful enough to provide clusters, even if no meaningful groups are embedded in the sample. Thus, the cluster analysis has the potential to offer inaccurate depictions of the groupings in a sample, and can impose groupings where none exists. The second major concern when using cluster analysis is the inherently extensive reliance on the subjective judgment of the researcher. Despite these concerns, the existing research provides useful and comprehensive recommendations for using cluster analysis (Ketchen & Shook, 1996; Punj & Stewart, 1983). Some of these recommendations were integrated into the cluster analysis. For instance, because cluster analysis groups variables to maximize the distance between groups along all variables, variables with large ranges are given more weight in defining the cluster solutions. Thus, the clustering variables were standardized.

In addition, high correlation among clustering variables can be problematic because it may overweigh one or more underlying constructs. Thus, researchers need to correct multicollinearity through subjecting variables to factor analysis (specifically, principal component analysis with orthogonal rotation) and using the resultant uncorrelated factor scores for each observation as the basis for clustering (Ketchen & Shook, 1996; Punj & Stewart, 1983).

In general, both exploratory and confirmatory factor analysis (CFA) are well suited to reduce the number of factors to a few manageable numbers. Recent developments and research suggest that CFA is a more rigorous and precise test of unidimensionality than traditional techniques such as exploratory factor analysis (Anderson, Gerbing, & Hunter, 1987; Anderson & Gerbing, 1988). CFA allows a stricter interpretation of unidimensionality than can be provided by an exploratory factor analysis. CFA provides different conclusions about the acceptability of scales (Anderson & Gerbing, 1988). In terms of the critical issue of avoiding multicollenarity, both approaches produce similar results. Despite these advantages, CFA has one specific disadvantage in the present context. Although the exploratory factor analysis as a principal component model treats constructs as a perfect linear combination of its measures, the CFA in the context of SEM literature offers two different measurement models: principal factor (reflective) model and composite latent variable (formative) model. Both differ according to the direction of causality between constructs and measures. The direction of causality is from construct to measure in the case of the reflective model. For formative model, the direction of causality is vice versa (Jarvis, MacKenzie, & Podsakoff, 2003). In this context, the causality between constructs and measure is not without debate. For example, in the later-explored after-sales services scale, many of the items could be entirely uncorrelated; yet, together they are important for building an index of the quality of after-sales service. This would lead to a formative scale. However, formative and reflective measurement models and scales are basically used in the SEM context. The fact that SEM is not recommended as the analytical approach for the present underlying perspective on strategy fit (fit as gestalts) and the challenges for deciding whether the scales and measurement models are reflective and/or formative led to the decision of using an exploratory factor analysis. The consequences of this decision on the limitations of this study and on future research are discussed in the last section.

The exploratory factor analysis was used to reduce a large set of items from the structured questions to a few manageable factors. Because contingency theory suggests that there is coherence between constructs characterizing the external environment

and constructs capturing the various dimensions of a service strategy, two separate factor analysis were conducted (Hambrick, 1984). The first focuses on reducing the items referring to the external environment to a few manageable factors. The second concentrates on the strategic dimensions. The various items were subjected to a factor analysis using principal component analysis with varimax rotation (Hair, Anderson, & Tatham, 1987). The resulting factors were used as inputs for two separate cluster analysis. Clustering the environment variables led to four clusters. Four clusters could be also identified for strategic dimensions. The combination of environment and strategy clusters were explored by comparing successful and unsuccessful SBUs. This means that the differences between "high" and "low" performance business in their internal congruence among the set of environmental and strategic variables are explored by using cross-classified tables.

3.4. Measurement development and validation

Following Churchill's (1979) recommendation for developing valid and reliable scales, item generation for the various constructs was based mainly on existing concepts of strategic and service management. A few scales such as scales for different service offerings and number of customer needs were newly developed. Consistent with the conceptualization of competitive intensity in the product and service fields, two scales with four items covering the general competitive situation, price competition, competitive reactions to new market introductions, and intensity of price discounting were used (Jaworski & Kohli, 1993). Market growth was assessed using an item, which measures the growth rate of total sales in a business unit's principal market segment (Slater and Narver, 1994). Customer price sensitivity was operationalized using three items, which refer to aspects of the price significance for customers, attitude, and comparison. The strategic options were operationalized through customer needs. If the customers only concentrated on outsourcing the maintenance activities, the number of customer needs was very low. In contrast, the number of customer needs was interpreted as high, if customers followed different strategic options. Based on a review of the (limited) literature on customer needs in the field of manufacturing companies (Sharma & Lambert, 1994; Schuh, Friedli, & Gebauer, 2004), a comprehensive list was identified of 14 needs, which cover the range of customer needs that reflect different strategic options for operating the product.

The operationalization of the different competitive positioning is based mainly on Kim and Lim (1988) and Dess and Davis (1984). The construct of cost leadership was operationalized using items which refer to aspects of manufacturing efficiency, competitive pricing, and economies of scale. The construct of product differentiation was assessed using three items, which relate to the degree of product differentiation, intensity of new product development, and price of the product. Service differentiation was operationalized similarly with product differentiation, and was assessed by the degree of service differentiation, new service development, and price level of services. The service marketing differentiation was operationalized with three items, which refer to service sales, intensity of service marketing, and emphasis on offering services.

The service offering was conceptualized through a comprehensive list of 18 services, which covered several service categories. These included basic services to augment the firm's product offering (information, documentation, and so on), services for the installed base (e.g., basic training, spare parts, inspection/diagnosis, repairs maintenance services), operational services (taking over customer maintenance functions and customer operating processes), and professional services (process-oriented R&D and design and construction services). A dichotomous scale (with "0 = not offered" and "1 = offered") indicated whether or not a service was offered (Homburg et al., 2003) for each of the 18 industrial services. All other items were measured on a five-point scale (1 = lowest score, 5 = highest

Table 1
Results of the exploratory factor analysis (external environment)

Factors and Items	Factor loading	Cronbach Alpha
Competitive intensity in the product field		0.90
General competitive situation fir products	0.76	
Price competition for products	0.85	
Competitive reactions to new product introductions	0.82	
Intensity of price discounting fir products	0.88	
Competitive intensity in the service field		0.92
General competitive situation for service	0.66	
Price competition fir services	0.81	
Competitive reactions to new service introductions	0.84	
Intensity of price discounting for services	0.85	
Price Sensitivity		0.94
Price importance	0.84	
Price attitudes	0.88	
Price comparison	0.86	
Ensuring proper functioning of the product		0.86
Availability of spare parts	0.80	
Quality of repairs and inspections	0.79	
Quick trouble shouting	0.77	
Optimizing efficiency and effectiveness of the product in the customer process		0.91
Optimized yield of the customer process	0.82	
Optimized up -time of the product within the customer process	0.66	
Maximized mean-time between repairs and failure (MTBR and MTBF)[a]	0.78	
Minimized mean-time to recover (MTTR)[b]	0.78	
Collaborative innovation for customer's operating processes		0.95
Technical advice to reconfigure existing customer processes	0.90	
Technical support to innovate new customer processes	0.89	
Reduction in the initial investments		0.81
Reduction of the capital employed	0.79	
Change from fix to variable costs	0.74	

[a] Mean-time-between4ikre (MTBF) and Mean-time-between-repair (MTBR) is the "average" time between product failures and repairs.

[b] Mean time to recovery (MTTR) is the average time that a product will take to recover from a non-terminal failure.

score). Tables 1 and 2 summarize the operationalization of the constructs according to the framework presented earlier.

In terms of measurement validation, all multi-item constructs for the external environment were then subjected to an exploratory factor analysis. The test result for sphericity was large at 4176.508, and the associated significance level lower than 0.001. The result of the Kaiser–Meyer–Olkin (KMO) measure was 0.85 and, therefore, provides further support for the factor analysis. No items exceeded cross-loadings with other factors by more than 0.35. The final factor solution contained seven interpretable factors, accounting for 77.74% of the common and unique variance and 22 items with communalities ranging from 0.66 to 0.90. Therefore, the degree of confidence of the factor solution was permissible. As indicators of internal reliability, the Cronbach's alpha values range from 0.81 to 0.95, and are at an acceptable level. Interestingly, the various customer needs do not load on only one factor. Indeed, the factor analysis suggests four different factors. These can be interpreted as ensuring a proper functioning of the product, optimizing the efficiency and effectiveness of the product in the customer process, leading to collaborative innovation in customer's operating processes, and reducing the initial investments. The latter reflects the reduction of capital employed. Collaborative innovation for customer's operating processes includes technical advice to reconfigure existing customer processes and technical support to innovate new customer processes. Optimized yield and uptime, together with the maximized mean-time-between-repairs and failures and minimized mean-time-to-recover, load on the factor for optimizing the efficiency and effectiveness of the product in the customer processes. Ensuring proper functioning of the product reflects the availability of spare parts, basic training and inspections/diagnosis, and repair/troubleshooting.

Table 2
Results of the exploratory factor analysis (service strategy)

Factors and Items	Factor loading	Cronbach Alpha
Cost leadership		0.84
Manufacturing efficiency	0.67	
Competitive pricing	0.84	
Economies of scale	0.89	
Product differentiation		0.94
Degree of product differentiation	0.87	
New product development	0.77	
Price level of the product	0.83	
Service differentiation		0.80
Degree of service differentiation	0.62	
Price level of the services	0.67	
New service development	0.80	
Emphasis on service offering	0.69	
Extension of service sales	0.71	
Intensity of service marketing	0.66	
After-sales services		0.83
Spare parts	0.71	
Repair/trouble-shouting	0.64	
Basic training	0.85	
Inspections/diagnosis	0.86	
Process-oriented services		0.92
Maintenance contracts	0.84	
Process optimization	0.89	
Process consulting	0.80	
Advanced operator training	0.79	
Research and development		0.76
Design and construction services	0.87	
Process-oriented R&D	0.85	
Operational services		0.84
Taking over customer maintenance function	0.79	
Taking over customer operating processes	0.89	
Taking over customer's logistics	0.65	

The same procedure was applied to the multiitem constructs for the strategy. The test result for sphericity yielded a high score at 4410.968 and the associated significance level was lower than 0.001. The result of the KMO measure was 0.78 and, was therefore, classed as meritorious, providing further support for factor analysis. The factor for customer service did not exceed an eigen value (latent root criterion) of 1 and was considered nonsignificant (Hair et al., 1987). Thus, the items for customer service were removed from the final factor solution. The final factor solution contained seven interpretable factors accounting for 74.2% of the common and unique variance and 25 items with communalities ranging from 0.62 to 0.89. As shown in Table 2, items for the service marketing differentiation and service differentiation load on the same factor. This finding is consistent with the broad range of literature on the inseparability of production and consumption of services (Zeithaml, Parasuraman, & Berry, 1985), which implies that the company's employees and customers interact directly on a regular basis. The high importance of personal interaction in delivering services (Bitner, Booms, & Tetreault, 1990) makes it difficult to separate service differentiation and service marketing differentiation. The Cronbach's alpha value ranges from 0.76 to 0.94 and is at an acceptable level. Altogether, the degree of confidence of the factor solution is permissible. Compared to the conceptualization, the service offering does not load on only one factor. The different service offerings form four factors. The first includes spare parts, repair, troubleshooting/diagnosis, and inspections. This factor is interpreted as typical after-sales services (Lalonde & Zinszer, 1976). The second factor reflects Oliva and Kallenberg's (2003) notion of process-oriented services. It includes maintenance contracts, process optimization, process consulting, and advanced training. The third factor includes design and construction services and process-oriented research and development, and can be interpreted as research and development services. The last factor covers services such as taking over the customer maintenance function, operating processes, and the customer's logistics. Based on Oliva and Kallenberg's (2003) as well as on Mathieu's (2001) classification of services, this factor is interpreted as operational services.

4. Results

Based on the contingency view, Hambrick (1984) argues that the fact that different types of environments call for different kinds of strategies seems to require separate development of environmental taxonomies and strategy taxonomies. Thus, two

Table 3
ANOVA tests associated with both cluster analysis

Constructs/factors	*F*-test	*p*-value
External environment		
Competitive intensity in the product field	24.320	0.000
Competitive intensity in the service field	8.452	0.000
Market growth	1.891	0.136
Price sensitivity	64.010	0.000
Ensuring proper functioning of the product	7.292	0.012
Optimizing efficiency and effectiveness of the product in the customer process	58.604	0.000
Collaborative innovation for customer's operating processes	15.562	0.000
Reduction in the initial investments by paying for performance	2.946	0.036
Strategy		
Cost leadership	14.118	0.000
Product differentiation	10.689	0.000
Service differentiation	11.665	0.004
After-sales services	47.126	0.000
Process-oriented services	59.365	0.000
Research and development services	5.925	0.001
Operational services	12.132	0.000

different cluster analyses have been conducted. The first includes the seven factors and the single-item construct on market growth characterizing the external environment. The second cluster analysis includes the seven factors characterizing the strategy. They were used as the discriminating variables in a cluster analysis to determine types of strategies. In both cases, the cluster analysis yielded four clusters. The ANOVA tests shown in Table 3 confirm that all variables differentiate significantly across the four clusters on strategic dimensions and seven out of eight variables differentiate across the four clusters on external environment. Only the market growth was not found to discriminate between the four clusters. Table 4 depicts the cluster means of the discrimanting variables. The four clusters are described as follows:

4.1. External environment

4.1.1. Cluster 1: highly competitive and very price-sensitive customers

This group of 80 members is dominated by the high competitive intensity for products and services, very price-sensitive customers, and high demand for ensuring the proper functioning of the product. The means of these four factors are significantly higher than clusters 2 and 4. Competitive intensity for products and services and customers' price sensitivity are on a similar level as cluster 3. Cluster 1 is confronted mainly with customers demanding simply the proper functioning of the product. Very little attention is paid to optimizing efficiency and effectiveness of the products in the customer process, collaborative innovation for customer's operating processes, and reduction in the initial investments by paying for performance.

Table 4
Cluster means of discriminating variables ($n=195$)

	Constructs/factors	Cluster 1: highly competitive and very price sensitive customers ($n=80$)	Cluster 2: low competitive intensity and concentrating on optimizing customer processes ($n=54$)	Cluster 3: highly competitive and stung interest in reducing the initial investments ($n=28$)	Cluster 4: low competitive intensity and concentrating on collaborative innovations ($n=33$)
External environment	Competitive intensity in the product field	0.92	0.29	0.83	0.28
	Competitive intensity in the service field	0.86	0.25	0.86	0.23
	Market growth	0.21	0.34	0.11	0.45
	Price Sensitivity	0.92	0.37	0.88	0.35
	Ensuring proper functioning of the product	0.71	0.54	0.42	0.62
	Optimizing efficiency and effectiveness of the product in the customer process	0.23	0.72	0.41	0.57
	Collaborative innovation for customer's operating processes	0.13	0.16	0.21	0.77
	Reduction in the initial investments	0.14	0.17	0.89	0.27
		Cluster 5: Cost leadership and after-sales services ($n=63$)	Cluster 6: Service and product differentiation and process-oriented services ($n=83$)	Cluster 7: Cost leadership and operational services ($n=23$)	Cluster 8: Service and product differentiation and research & development services ($n=26$)
Strategy	Cost leadership	0.80	0.25	0.74	0.21
	Product differentiation	0.21	0.83	0.56	0.60
	Service differentiation	0.30	0.89	0.32	0.67
	After-sales services	0.95	0.43	0.40	0.56
	Process-oriented services	0.22	0.77	0.31	0.63
	Research and Development	0.08	0.24	0.24	0.93
	Operational services	0.10	0.17	0.74	0.24

4.1.2. Cluster 2: low competitive intensity and concentrating on optimizing customer processes

Cluster 2 consists of 54 members. Its mean is the highest for optimizing efficiency and effectiveness of the product in the customer process. Similar to cluster 1, collaborative innovation for customer's operating processes and reduction in the initial investments by paying for performance are of little importance. Cluster 2 mean for the factor of ensuring the proper functioning of the product is significantly lower than cluster 1. In terms of competitive intensity and price sensitivity, cluster 2 is similar to cluster 4. Both clusters are confronted with a very low competitive intensity and price sensitivity.

4.1.3. Cluster 3: highly competitive and strong interest in reducing the initial investments

Cluster 3 has 28 members. It achieves the highest degree in reducing the initial investments. In terms of competitive intensity and price sensitivity, the means are higher than clusters 2 and 3, but are very similar to cluster 1. Ensuring the proper functioning of the product and optimizing the effectiveness and efficiency of the products are on a medium level. The mean for the factor of ensuring proper functioning is below clusters 1, 2, and 4. Optimizing the effectiveness and efficiency is significantly lower than clusters 2 and 4, but higher than cluster 1. Customers' interest in collaborative innovations is on a similar level as clusters 1 and 2. The mean for this factor is significantly lower than cluster 4.

4.1.4. Cluster 4: low competitive intensity and concentrating on collaborative innovations

Finally, cluster 4 represents a group of 33 members. Cluster 4 is dominated by the high interest in collaborative innovations for customer's operating process. In terms of competitive intensity, cluster 4 is similar to cluster 2, but significantly lower than clusters 1 and 3. The same argumentation applies for customer's price sensitivity. The interest in ensuring proper product functioning and in optimizing efficiency and effectiveness of the product in the customer process is on a medium level. In the case of ensuring proper product functioning, the mean of cluster 4 is higher than clusters 2 and 3 and lower than cluster 1. The mean of cluster 4 for optimizing efficiency and effectiveness of the product is significantly higher than clusters 1 and 3 and lower than cluster 2.

4.2. Taxonomy of strategies

As shown in Table 4, four distinct clusters emerged among the strategic variables. The four clusters contained 63, 83, 23, and 26 cases, respectively. All SBUs were classified into one of the four groups.

4.2.1. Cluster 5: concentrating on cost leadership and after-sales services

Cluster 5 is conscientious about cost leadership and after-sales services. The means for both variables are significantly higher than clusters 6, 7, and 8. In contrast, the means of the other strategic variables are lower than clusters 6, 7, and 8. Consequently, this cluster does not put emphasis on process-oriented services, research and development services, and operational services. In addition, member of this cluster do not follow a product and service differentiation.

4.2.2. Cluster 6: high service differentiation and process-oriented services

This cluster uses product and service differentiation to seek for competitive advantages. The means of both variables are significantly higher than clusters 5, 7, and 8. Compared to those clusters, this one puts the highest emphasis on process-related services. The other types of services such as after-sales services, research and development, and outsourcing services are not offered very actively. The mean for after-sales service is lower than clusters 5 and 8, and on a similar level as cluster 7. Research and development services achieve much less importance as in cluster 8. They are on a level equal to cluster 7, and more important than in cluster 5. The emphasis on outsourcing services in cluster 6 is similar to clusters 5 and 8, but is significantly lower than cluster 7.

4.2.3. Cluster 7: cost leadership and operational services

This cluster gives little consideration to service differentiation through superior after-sales services, process-oriented services, and research and development services. It puts only significantly higher emphasis on outsourcing services than clusters 5, 6, and 8. Additionally, members of this cluster focus on cost leadership. The mean of cost leadership is significantly higher than clusters 5 and 8. This cluster uses product differentiation intermediate to that in clusters 5 and 6 and is quite similar to cluster 8.

4.2.4. Cluster 8: differentiation and research and development services

Finally, cluster 8 puts the highest emphasis on research and development services. It also uses product and differentiation services intermediate to that of customers of 5, 6, and 7. The same applies for after-sales and process-oriented services. Means of both variables are higher than clusters 5 and 7, but significantly lower than cluster 6. Cluster 8 also pays intermediate intention to after-sales service and process-related services. The emphasis on after-sales services is lower than cluster 5, but significantly higher than clusters 6 and 7. Cluster 7 outperforms cluster 8 in terms of emphasis on process-oriented services. However, cluster 8 puts significantly more emphasis on these services than clusters 5 and 6.

4.3. Testing the predictive and descriptive validity

To test descriptive and predictive validity, a cross-classified table between the four clusters on environment and the four clusters on strategic dimensions was created. As illustrated in Table 5, the horizontal axis contains the four clusters on environment taxonomies; whereas the vertical axis represents the four clusters on service strategy. Of the 108 high-performance SBUs, 100 belong to four specific environment–strategy configurations. In contrast, only 10 of the 77 low-performance

Table 5
Environment–strategy configurations (bold- high performance SBUs, cursive- low performance)

	Cluster 1: highly competitive and very price sensitive customers ($n=80$)		Cluster 2: low competitive intensity and concentrating on optimizing customer processes ($n=54$)		Cluster 3: highly competitive and strong interest in reducing the initialinvestments ($n=28$)		Cluster 4: low competitive intensity and concentrating on collaborative innovations ($n=33$)	
Cluster 5: cost leadership and after-sales services ($n=63$)	After-sales service provider							
	42	*1*	**1**	*13*				*6*
Cluster 6: service and product differentiation and process-oriented services ($n=83$)			Customer support service provider					
	2	*34*	**33**	*3*	***2***	*2*		*7*
Cluster 7: cost leadership and operational services ($n=23$)					Outsourcing partner			
			1	*3*	**11**	*4*		*4*
Cluster 8: service and product differentiation and research and development services ($n=26$)							Development partner	
	1				**1**	*8*	**14**	*2*

SBUs belong to the same four configurations. The majority of low-performance SBUs form different combinations between environment and strategy. Consequently, the membership in the four environment–strategy configurations serves as a predictor for the SBU performance. Table 5 depicts the results of the classification matrix. 90.8% of all SBUs are correctly classified and only 9.2% are misclassified. The ability of the environment–strategy configurations to predict performance better than random chance was, therefore, confirmed. The Tau statistic indicated that significantly fewer errors had occurred than would be expected by random chance. In addition, *t*-test confirmed that the performance of the four environment–strategy configurations created higher performance than other environment–strategy configurations.

Based on these tests, the four configurations can be interpreted as environment–strategy fits that improve overall performance. The four environment–strategy fits can be interpreted as service strategies in manufacturing companies, for example, *after-sales service providers (ASPs)*, *customer support providers (CSPs)*, *outsourcing partners (OPs)*, and *research partners (RPs)*. The value proposition of each service strategy and the links between environment and strategy variables are explained in the next paragraphs.

4.4. Service strategies

4.4.1. After-sales service providers

After-sales service providers (ASP) consist of 43 members by combining clusters 1 and 5. Cost leadership and concentrating on after-sales services correspond strongly with a highly competitive environment and very price-sensitive customers who *only* expect a properly functioning product. ASPs compete mainly through attractive prices for products and services; price discounting is used very frequently as a source of competitive advantage and concentration is mainly on cost leadership. Cost leadership means concentrating on achieving substantial economies of scale and high manufacturing efficiency. Predictably, the low prices cause deficits in product reliability, leading to sporadic breakdowns. This explains why customers not only invest in products, but also request support to ensure that the products function well. In the event of any breakdown or failure, ASPs offer customers after-sales services such as spare parts, repair, inspection, a hotline, and basic training. To conform to a cost leadership strategy, these after-sales services are standardized and predefined. The prices for these services are not integrated into the product price. Rather, they are priced individually according to the unbundling pricing approach (Guiltinan, 1987).

Sophisticated service needs such as the optimization of efficiency and effectiveness of the product in the customer process, collaborative innovation in customer's operating processes, and a reduction in the initial investments by paying for product performance are only minor issues. This explains why ASPs place very little emphasis on more sophisticated services such as process-oriented services or even research and development and operational services.

ASPs create a unique value proposition by providing products at attractive prices and guaranteeing reliable product functioning through after-sales services. The creation of such a value proposition leads to the following level of service-related outcomes and overall profitability: overall profitability (5.1%, standard deviation of 1.1%), direct service profitability (14.2%, 4.5%), the share of service revenue (15.6%, 3.7%), customer satisfaction (72.2%, 16.4%), customer loyalty in terms of repurchasing rate (67.5%, 11.3%).

4.4.2. Customer support providers

Customer support providers (CSPs) consist of a group of 36 members. CSPs form a unique value proposition by investing in a strong product and service differentiation. High product reliability leads to a sound reputation for quality, the creation of sustainable competitive advantages, and a less intensive competitive situation. This means that it is still possible to maintain some technological superiority and product differentiation in

terms of high product quality and reliability, which form a lasting strategy. CSPs supplement product differentiation through outstanding process-oriented services, leading to service differentiation. In accordance with the product differentiation in terms of quality, the goal of the comprehensive process-oriented services is to prevent breakdowns of the product in the first place. This means that CSPs' service goal conflicts with that of ASPs' whereas ASPs' objective is to react to breakdowns and product failures as soon as possible, CSPs' intention is to prevent breakdowns altogether. CSPs customize and bundle their service elements according to customer needs. The price of the services is not integrated into the product price. Services are bundled into customized packages and the customer pays a fixed price (Guiltinan, 1987). Overall, CSPs yield the following service-related outcomes and overall profitability: overall profitability (6.5%, 2.7%), direct service profitability (10.0%, 2.6%), share of service revenue (26.4%, 4.3%), customers satisfaction (82.1%, 16.5%), customer loyalty (75.8%, 12.0%).

4.4.3. Outsourcing partners

Outsourcing partners (OPs) is the most appropriate interpretation of the group of 15 members combining cost leadership, medium degree of product and service differentiation, customers' expectation of reducing both the initial investment, and high level of operational services. From the perspective of competitors, this means that buying product performance corresponds with a high competitive intensity in terms of price competition and price discounting. From the customer perspective, buying performance outcome is equivalent to customer attitudes toward comparing prices for performance, instead of value, technical features, or better services. OPs do not seem to be very sophisticated in the context of customer expectations in terms of ensuring the proper functioning of the product, optimizing the effectiveness and efficiency of the product within the customer processes, and innovating new solutions for customer processes. Mainly, operational services are definitely pushed. Other kinds of services are not important, and have only a very low score.

OPs combine cost leadership with service and product differentiation to offer attractive prices for operational services. Their goal is to assume the operating risk and full responsibility for the customer's operating processes. The value proposition of OPs is simply based on reducing the customer's capital employed and managing the corresponding risks. In contrast to CSPs, OPs do not create customized service packages. Operational services are standardized and focus on efficiency, economies of scale, and the belief that service customization is costly. However, offering attractive prices for the performance of the outsourced process without a sufficient product and service quality is insufficient. If the product breaks down frequently, troubleshooting, repairs, and spare parts will increase service costs, leading to a possible erosion of overall profitability. The latter explains why OPs perceive the importance of products and services as essentially higher than ASPs.

By offering operational services and being paid for performance, OPs are "pure" service companies. Overall profitability and service profitability are one and the same. The share of service revenue is 100% and the average overall profitability is 5.7% (1.3%). On an average, 89.0% (12.7%) of customers are more than just satisfied. Average customer loyalty, measured through the repurchasing rate, is very high at 95.1% (12.1%). The high repurchasing rate and customer loyalty indicate that OPs establish a strategic partnership with their customers.

4.4.4. Development partner

Development Partner's (DP) value proposition is based on the following key features. DPs provide research and development services to support customers to achieve outstanding process performance for the customer. By offering these services, DPs create a situation in which customers benefit directly from their development competencies. These competencies are co-produced between DPs and the customer, serve as a resource-acquisition barrier and can be translated into an entry barrier for competitors. DPs create a situation in which the competency position directly and indirectly makes it more difficult for competitors to catch up. Both DPs and their customers possess a unique and hard-to-imitate competency position, leading to sustainable competitive advantages (Dierickx & Cool, 1989; Wernerfelt, 1984). Because customers often use service provider identity and reputation as a proxy when evaluating new services, past successes in the service offerings can play an important role in reducing the perceived risk of customers when they consider the purchase of new service innovations (Storey & Easingwood, 1998). In this context, customers use DPs' past successes in typical after-sales services, process-oriented services, and product reliability as proxy when evaluating a possible collaborative innovation of customer process. This explains why DPs' value proposition also entails a considerable breadth of after-sales services and process-oriented services, contributing to the service differentiation, and requires a medium degree of product differentiation. Based on this argumentation, competitive equality has not been reached in the field of products and services, leading to intermediate competitive intensity. Price discounting and product imitations are not used very intensively as a means of creating competitive advantages.

DPs achieve the following performance outcomes: overall profitability (7.5%, 1.2%); direct service profitability (8.4%, 1.3%); share of service revenue (21.1%, 2.3%); customer relationship (94.1%, 7.9%); and customer loyalty (93.0%, 8.1%).

5. Conclusion

5.1. Theoretical implications

The findings explored four environment–strategy fits and the corresponding service strategies. This robustness of the result depends on the selection of clustering algorithms, because the rules or procedures for sorting observations are critical to the effective use of cluster analysis (Punj & Steward, 1983). Thus, the cluster analysis was conducted with different clustering algorithms. The different clustering algorithms supported these results. Needless to say, determining the number of clusters is not without bias. As suggested by Ketchen and Shook (1996),

confidence in the number of clusters is greater when multiple methods converge. Specifically, change in the agglomeration coefficient and observing breaks in the dendogram were used. Both methods yielded four clusters for environment and strategy. Using multiple methods and clustering algorithms ensured the reliability of the derived clusters.

The four service strategies offer a complementary perspective on strategy configuration in manufacturing companies. The broad range of existing literature typically includes services as a competitive priority in manufacturing–strategy configurations. Manufacturing innovators concentrate on quality, flexibility, service, and price. Caretakers simply focus on prices. Marketers try to optimize flexibility, quality, service, and product variety (Frohlich & Dixon, 2001; Miller & Roth, 1994). The role of services has not been described in more detail in the context of the manufacturing strategy configuration. The results explain specific service strategies and highlight how service strategies supplement competitive positioning and correspond with the external environment. Additionally, instead of generally confronting manufacturing firms with the question of what position they should occupy on the tangible goods–services continuum, the results indicate four specific environment–strategy configurations that function as specific service strategies. The four service strategies outlined here are not intended to be exhaustive, but rather to highlight potential directions that can make a theoretical contribution to strategic management research in the context of the transition from products to services.

5.2. Managerial implications

The four specific service strategies serve as managerial navigators, indicating the consistent configuration of environment and strategy. Additionally, the specific report of overall profitability and service-related performance outcomes can serve as benchmarks. Managers can use the benchmarks to indicate whether or not they fully exploit the opportunities provided by the different service strategies. Needless to say, the degree of performance outcomes also depends on organizational design factors. However, the implementation of these factors is beyond the scope of this work, which concentrates only on the environment–strategy fits and corresponding service strategies.

To exploit the opportunities of services successfully, manufacturing firms have to establish the appropriate alignment between the external environment and strategy. This means that there is no one way of positioning on the transition line. Only if managers understand the characteristics of the company's external environment are they able to identify and formulate the right service strategy. Consequently, one key factor for success appears to be a managerial orientation toward markets. Market and customer orientations are key factors in forming the four service strategies. Identifying the alignment of strategy and environmental characteristics seems to present both the major challenges and the primary implications for managers. Managers considering formulating the customer-support service strategy, for example, should be aware of the importance of establishing product and service differentiation as a lasting strategy that creates a low competitive intensity and corresponds with the low price sensitivity of customers. Formulating the outsourcing partner service strategy requires substantial managerial effort with respect to strong cost leadership, and only medium product and service differentiation. After-sales service providers should concentrate on achieving cost leadership. A research partner should emphasize product and service differentiation. These are just few examples of the main managerial implications.

5.3. Limitations and future research opportunities

As with any research, this study has limitations, too. The study is based on factor and cluster analysis. The reliability and descriptive and predictive validity were, for example, demonstrated, but the external validity of the clusters could not be assessed. External validity can only be achieved by analyzing both the sample of interest and a similar sample, and by assessing the similarity of the results. As in many studies, a "hold out" sample is not available in this context (Ketchen & Shook, 1996). Thus, future research would benefit from insights obtained from the second sample. The distinction between companies that are highly successful (less successful) in their alignment between environment and strategy based on overall operating margins of above (below) 5% may be subject to debate. Future studies can use different ways to split the sample. The researcher can either draw on different performance measures (e.g., share of service revenue, direct service profitability, and so on) or use the median to split the sample.

In addition, using the perspective fit as gestalts with it underlying analytical approaches exploratory factor analysis and cluster analysis is not without debate. Future studies on environment–strategy configuration in the context of service strategies in product manufacturing companies would benefit from the use of different perspectives such as fit as moderation, fit as mediation, etc. Specifically, using a confirmative factor analysis would support the existing results. The discussion on whether the scales are formative or reflective would contribute to the existing theory on measurement scales and models for obtaining fit and configurations in the context of service strategies in product manufacturing.

Although key informant bias is not an issue in this study, using single informants might cause concerns. Environment–strategy configurations cover a broad range of aspects and it seems questionable that one interviewee is knowledgeable about all of them. Future research, which is not limited to using single informants, should prove useful to substantial the findings. In addition, involving firms with extensive direct experience with different service strategies is surely essential for collecting high-quality data. As pointed out by Neu and Brown (2005), future research might also benefit from other sources, including customers or industry experts. The study is also limited by concentrating on Western European companies. Applying the results to other regions could further enhance the transferability and generalizability of the results.

The preliminary conceptual framework (Fig. 1) guided the semistructured data collection. Because of the unstructured questions, the framework was regarded as flexible and new

insights emerged, that can be explored further. Specifically, a firm's strategic position was highlighted as a key factor, enabling the successful implementation of service strategies. In addition to product and service differentiation, strategic partnerships and relation-specific views were reported to aid the formulation of the outsourcing and development partner strategy. Future research, which investigates the role of strategic cooperation and partnership, should prove useful.

Finally, the study deals only with service strategies for the primary customer activity chain. There are also service opportunities in the supplementary or adjacent customer activity chains. These service strategies are beyond the scope of this article. Nevertheless, the increasing importance of services for the adjacent customer activity chain (Sawhney et al., 2004) should provide promising research prospects.

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