



## The potential of management accounting and control in global operations

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## **The potential of management accounting and control in global operations-profitability-driven service business development**

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### **Abstract**

**Purpose:** This paper focuses on identifying the financial potential of new service businesses in the context of a global machinery manufacturer. The objective is to examine the supportive role of management accounting and control in service business development, which has not been empirically examined previously.

**Design/methodology/approach:** The paper takes advantage of an interventionist case study at a global machinery manufacturer and is empirically based on a comprehensive examination of the service business potential in the selected product category in different market areas. The researchers were actively involved in the accounting development activities underlying this paper.

**Findings:** The results suggest that the development of a global service business is necessary to build on market area characteristics. An analysis should combine financial information and equipment fleet information across product lines and organizational units.

**Research limitations/implications:** Management accounting and control practices tend to require significant development to actually support the process of identifying and capturing the service business potentials. As the findings are limited to one case environment, further studies should address the longitudinal evolution of management accounting and control, and the choice and utilization of different performance measures, in similar contexts.

**Practical implications:** The paper provides managerial insights on how to utilize management accounting information and proposes ideas for performance indicators.

**Originality/value:** The process examined in this paper responds to the need for tools and techniques supporting service business development. Management accounting and control could provide a comprehensive understanding of the dynamics of service business profitability potential and support in identifying and prioritizing the possible avenues of realizing such potential.

## **Introduction**

This paper focuses on the identification and realization of the financial potential of new service businesses in the context of a global machinery manufacturer. For companies selling industrial equipment, product sales can be seen as a way to generate long-term revenue streams through different kinds of service offerings. However, many companies find it difficult to successfully exploit the financial potential of service businesses (Gebauer *et al.*, 2005). The profitability-driven development of new service businesses, despite its rationality, represents a challenge for the management control of globally operating manufacturing companies since there is a need to obtain a comprehensive understanding of profitability at different levels and to examine how various parts of a business might better fit together to improve companies' overall profitability. This study responds to the identified lack of tools and techniques for supporting service business design in manufacturing companies (Baines *et al.*, 2009). More particularly, Laine *et al.* (2012a) highlighted the need for suitable means to support the service business renewal process, from the justification and definition of the actions to the control of the gained results. Among those means, they introduced and examined different roles of management accounting (MA) within management control systems (MCSs) in different roles supporting service business development.

Globally operating organizations face particular problems in using MA and MCS to facilitate business decisions. There are challenges in managing interactions across heterogeneous local contexts at different organizational levels (Meyer *et al.*, 2011). In this context, Cruz *et al.* (2011) highlight that to achieve both local- and corporate-level objectives, local units can reshape or reconstitute the global MCSs. Additionally, the interplay between the formal and the informal domains of MA needs to be recognized in globally operating companies (Lukka, 2007). For example, formal development of accounting and control systems may sometimes be overrun by informal routines, thus adding the complexity of accounting development processes. As the structure and use of MA should continuously fit in the external environment and be in line with the current management priorities (Korhonen *et al.*, 2013), there might be a continuous need for new levels and dimensions of reporting, analysis, and

measurement of financial figures. For example, the business impact analysis (BIA) of new service offerings may require data on the combinations of different products and service categories across the business units. In general, producing the right MA information is ambiguous since the financial reporting lines, organizational structure, and different accounting practices across organizational units may not support the structure of target setting and the nature of the business objectives.

In the context of machinery manufacturers, substantial revenues can be generated from a large installed base of products with long lifecycles (e.g., Gebauer *et al.*, 2005). Companies should pay attention to the link between equipment deliveries and their impact on service business sales. Moreover, to obtain an overall view of the service business potential, the financial analyses should be supplemented with equipment fleet information. Rabetino *et al.* (2015) studied the concept of lifecycle service offerings and argued that to identify profitable service solutions, there is a need to quantify their potential financial value, such as the total costs of ownership and productivity increases among customers. In turn, Grönroos and Helle (2010) discussed how to measure and share mutually created value between suppliers and customers. They pointed out that to share the value between suppliers and customers, the business partners must have access to comprehensive accounting data. However, there is little empirical evidence on how to actually produce and use financial data to support the development of service businesses in globally operating manufacturing companies (Laine *et al.*, 2012b).

Altogether, detailed examinations of approaches for steering the exploitation of the service business potential in manufacturing companies are lacking in the existing literature. Indeed, there is substantial research on how machinery manufacturers should change their operational routines to develop service businesses (Kucza and Gebauer, 2011; Neu and Brown, 2008; Brax, 2005; Oliva and Kallenberg, 2003). Several studies have also investigated the relationship between the scale of service offerings and manufacturing firms' overall profitability (Kohtamaki *et al.*, 2015; Kastalli and Van Looy, 2013; Eggert *et al.*, 2014). In addition, Cheng and Shiu (2016) examined the link between service modularity and firm performance in the service industry. However, Araujo and Spring (2006) pointed out that increasing the variety of new services often entails significant costs, and thus companies should focus more on identifying the kinds of services that customers really need. Further, according to Shulver

(2005), new service development should be based on the idea of how the new offerings can resolve the problems in existing systems and processes. Despite the wide interest in the impact of industrial services on companies' overall performance (Cheng and Shiu, 2016; Kohtamaki *et al.*, 2015), there is limited empirical evidence regarding how manufacturing companies actually plan and control their service activities to achieve more profitable businesses with the help of MA (Laine *et al.*, 2012a; Araujo and Spring, 2006). In this context, the challenges arising from the multi-dimensional organizational structure in MA practices have not gained much attention.

The objective of this paper is to examine the supportive role of MA and control in service business development, which has not yet been empirically examined. The paper seeks to respond to the following research questions: 1) How can service business potential be understood through MA information and performance indicators? 2) How can service business development activities be selected and prioritized with the help of financial information?

The paper takes advantage of an interventionist case study at a global machinery manufacturer and is empirically based on a comprehensive examination of the service business potential in the selected product category, featuring different individual product types, different market areas, and different reporting practices. The researchers were actively involved in the entire process of accounting development underlying this paper. The contribution of the paper lies in the identification of the challenges in creating supportive management control practices and, more importantly, in the detailed description of overcoming these challenges in a real-life case. The paper is organized as follows. First, the literature review serves as the background of the empirical study, combining the findings on identifying and overcoming the challenges of MA and control in globally operating companies with the existing service business development and servitization literature. The third section presents the setting and findings of the empirical study. The implications of the findings are discussed and concluding remarks are presented in the final section.

## **Literature review**

### *Management control frames new service business development activities*

There are several definitions and classifications of MCSs, tools, and practices (e.g., Berry *et al.*, 2009; Tessier and Otley, 2012). Chenhall (2003) pointed out that the terms MA, management accounting systems (MASs), MCSs, and organizational controls (OCs) are sometimes used interchangeably, even

though they are different concepts with different meanings. To simplify, management controls include all the devices and systems that managers use to guide the behavior and decisions of their employees to ensure that they are consistent with the organization's goals and strategies (Malmi and Brown, 2008; Mundy, 2010). In this context, a goal refers to things that an organization wishes to achieve in a given performance area (markets, products, personnel, financial results) (Flamholtz, 1983). Malmi and Brown (2008) stated that management controls comprise all the rules, practices, values, and other activities management puts in place to direct employee behavior, and if these are complete systems, they should be called MCSs. In management control, the focus is not only on the provision of formal financially quantifiable data but also on assisting managerial decision-making with a broad scope of information related to, for example, markets, customers, and production processes (Chenhall, 2003).

There are several MCS peculiarities that need to be addressed in globally operating companies with multi-dimensional organizational hierarchy. According to Malmi and Brown (2008), one issue involves how the elements of management control relate to each other down the organizational levels and across organizational units. The organizational structure itself can also be seen as an example of management control (Flamholtz, 1983). Cruz *et al.* (2011) noted that in a global organization, the dispersed local units are usually compelled to adopt standard rules and procedures, which are elaborated upon at the headquarter level to increase the visibility of the local business processes and to align them to fit the global corporate strategy. However, in the context of globally operating companies, there are challenges in managing local operations in such a way that they completely fit the company-level framework (Meyer *et al.*, 2011). Hence, Cruz *et al.* (2011) also highlighted that in the global environment, each local unit has its own specific needs and environment, and thus it may be difficult and even unnecessary to apply a homogeneous set of practices across the company.

Developing new service businesses is a strategic initiative for machinery manufacturers, and an MCS is involved in such an initiative either actively or passively. When examining the interrelationship between MCS mechanisms and strategy, Kober *et al.* (2007) found that the interactive use of MCS mechanisms helps to facilitate a change in strategy, and that MCS mechanisms change to match a change in strategy. Regarding the MCS in service business development, there are different views on how manufacturing companies should distinguish between product and service businesses (Kucza and Gebauer, 2011). For example, Oliva and Kallenberg (2003) argued that service units should be separated from product organization. On the other hand, Neu and Brown (2005) recommended that to meet complex customer needs, product and service units should be integrated. Further, Oliva and

Kallenberg (2003) reported that service business development, or servitization, may change the business model and organizational concept from product oriented toward customer segment or relationship oriented. Regarding servitization, Brax (2005) noted that it is fundamental that the systems of the company are not purely transaction oriented when providing services for installed bases. Altogether, even the very basic structure of the global machinery manufacturer and thus the overall MCS is challenged by service business development. At a more detailed level, there is a potentially huge variety of different possible controls and control systems. To be effective, the production and use of financial information should fit the overall MCS and respond to the more detailed needs of servitization. Although Laine *et al.* (2012a) discussed the generic roles of MA in servitization, the actual fit between MA practices and the overall MCS in the service business development of machinery manufacturers has not been examined in the literature.

#### *MA in producing and using information for new service business development*

MA means producing and using financial information for managerial purposes. According to the Institute of Management Accountants (IMA), “Management accounting is a profession that involves partnering in management decision making, devising planning and performance management systems, and providing expertise in financial reporting and control to assist management in the formulation and implementation of an organization’s strategy” (IMA, 2008, p. 1). Tillmann and Goddard (2008) defined strategic management accounting (SMA) as the use of MA systems in support of strategic decision-making. Chenhall and Moers (2015) pointed out that MA has developed into MCSs comprising multiple controls and different styles of usage of MA practices. It has been suggested that MA should serve various managerial purposes, and through interactions within the organization and with its environment, the accounting information helps to facilitate strategic change in a proactive way by developing knowledge about the business environment as well as to prepare the organization for unknown future decisions and activities (Hall, 2010; Kober *et al.*, 2007).

In globally operating companies, MA may face challenges due to the fostering of multiple perspectives and the coordination of complexity and resource allocation (Dent, 1996). To organize and coordinate globally dispersed operations, global companies may force their local units to adopt standardized accounting practices (Cruz *et al.*, 2011). However, according to Chenhall (2003), formalized MA systems are ill suited when there is a high level of interdependency between local units. In this context,

Abernethy *et al.* (2004) pointed out that decentralization choices are an important determinant of MA practices. In addition, Lukka (2007) highlighted that the excessive standardization of MA practices in a globally operating company may not be necessary.

In general, MA practices are assumed to be based on relatively clear financial data and lines of responsibility within hierarchical structures (Chenhall and Moers, 2015). Moreover, companies' MA systems are usually strongly unidimensional, which means that they may, for example, emphasize the product line to the exclusion of inter-product synergies or regional performance to the detriment of global coordination (Dent, 1996). Thus, static and unidimensional reporting, which still prevails in many companies, limits the use of MA for supporting strategic changes such as servitization. In practice, the examination of information gathered across financial reporting lines and from multiple local units with heterogeneous accounting practices may be needed. In this regard, Tillmann and Goddard (2008) argued that the way a very diverse set of accounting information is used to make sense of strategic issues is at least as important as the specific techniques that are used. Further, Chenhall and Moers (2015) suggested that the development of strategies that focus on product and service innovations require that external factors be taken into account as well. It has also been noted that modest business consequences might not be due to the non-existence of service business potential but perhaps to the misalignment of the service business objectives with the business environment (Laine *et al.*, 2012a). Thus, service business potential needs to be examined case by case to unveil the dynamics underlying the potential profitability of those new service businesses.

To justify, define, and control service business renewal actions, there may be a need to produce accounting information that is not directly available in the systems but is able to support decision-making in regard to particular new service businesses, single new services, or even single service elements within the processes. Laine *et al.* (2012a) stated that justifying servitization requires the identification of the potential values and costs of such a change from various perspectives and thus enables managers to assess servitization against other strategic alternatives. In addition, Oliva and Kallenberg (2003) noted that entering the markets implies identifying a profit opportunity within the service field and setting up the structures and processes to exploit it. Hence, justifying the need for change requires a shared understanding about the current status and aims for new directions. According to Laine *et al.* (2012a), the servitization process may affect manufacturers at the corporate level, the customer relationship and product levels, and even at the level of single elements of business processes, therefore highlighting the need to rethink the unit of analysis. Traditionally, the focus in MA is on



product- and service-level analysis. The profitability implications of service business actions can be evaluated more broadly, for example, on the level of equipment fleets. In addition, the unit of analysis may be determined on the basis of the business line, business unit, or on a regional basis.

MA tools and techniques for unveiling service business potential exist. As after-sales service businesses typically generate long-term revenue streams, managerial analysis and decision-making should not focus only on per-transaction profitability (e.g., Cohen and Whang, 1997). The financial potential of product-related service businesses can be highlighted with the help of the lifecycle costing (LCC) approach, which focuses on the total costs/profits that occur during a product's life (see, e.g., Asiedu and Gu, 1998). According to Wise and Baumgartner (1999), to pursue downstream opportunities, the manufacturer has to look at the value chain through the customer's eyes, examining all the activities the customer performs when using and maintaining a product throughout its lifecycle from sale to disposal. By using the LCC approach, it is possible to turn into monetary terms the future maintenance procedures, the consumption of spare parts, and the need for upgrades. This is supported by Dekker *et al.* (2013), who highlighted that the demand for spare parts is often difficult to forecast only on the basis of historical data, and thus it is useful to manage and analyze the installed base data by following the lifecycle of a product.

To support managerial decision-making, the diverse consequences of a decision alternative should be translated into a single financial unit of measure (Wouters, 2002). Laine *et al.* (2012a) outlined that one aspect that guides managers in choosing a reasonable MA approach is consideration of the accounting object. The traditional role of MA is to measure and manage product and service profitability, for example, on the product category, market area, or customer segment levels. However, in the case where services are embedded in the goods, identifying the profitability of separate elements becomes challenging (Gremyr *et al.*, 2010). For example, new service offerings may lead to organizational arrangements and thus highlight a need to examine the costs of business processes. In turn, when providing customers with lifecycle service offerings, manufacturers should pay attention to the cost and profit implications over a long period of time (Rabetino *et al.*, 2015). More broadly, the focus can even be on the customer's revenues. For example, the development of performance contracts may be based on the understanding of the customer's earning logic. The viewpoint of the accounting information in a given situation needs to be intentionally chosen to aid the actual decision-making.

*Key performance indicators provide more in-depth insight into particular development avenues*

Accounting information is typically scrutinized into a set of performance indicators that can be used to guide the decisions made in companies. Indeed, one important aspect of management control is performance measurement that assigns numbers to represent aspects of organizational performance and behavior (Flamholtz, 1983). According to Dossi and Patelli (2008), performance measurement is one way to manage relationships between headquarters and subsidiaries. In globally operating companies, the multidirectional flows of products, capital, and knowledge among various units have an influence on the nature of planning and control (Gupta and Govindarajan, 1991). For example, Abernethy *et al.* (2004) discovered that if one division has interdependencies, for example, the focal division affects another division's performance, then the use of divisional summary measures becomes less important, and the use of company summary measures and specific divisional measures such as quality and product cost increases. This may be due to the fact that the division's unique contribution in achieving the business results could be difficult to define. However, within multinational companies, performance measurement is not only a way to report and monitor financial results but also an organizational mechanism that coordinates the behavior of local units (Dossi and Patelli, 2008).

In the service business development context, Neu and Brown (2008) argued that the implementation of a service strategy requires the revision of measurement systems. However, Kastalli *et al.* (2013) highlighted that steering product-service providers toward the successful implementation of service businesses is difficult, as companies fail to reflect the presence of service activities in their performance management systems. In turn, Shulver (2005) suggested that an effective way to measure the performance of service activities is to define the current level against the achievable level of performance and thus determine the undeployed potential. That kind of approach is applicable for measuring both the effectiveness of internal processes as well as the company's position in the markets. It could be possible to measure, for example, the invoiced service hours of the maintenance personnel in relation to the total hours. In turn, the market share in a certain region can be defined on the basis of the actually served and the total equipment fleet.

As noted earlier, an organization's structure frames the MCS, defines the distribution of accountability and responsibility, and thus has an effect on the establishment of the performance indicators. However, measurement practices should not be directly tied to an organization's structure. For example, Kastalli *et al.* (2013) highlighted that servitizing firms should explicitly acknowledge and monitor the interaction between product and service activities. In practice, that may require combinations of

financial and non-financial figures across business lines and units. What is noticeable is that performance measurement may lead to suboptimization between different organizational units and hinder the overall economic results. For example, the provision of lifecycle service offerings to industrial customers may require the involvement of several local units whose performance is reported separately, and the conflicting objectives at the subunit level prevent companies from achieving optimal results as a whole. Thus, according to Kuczaj and Gebauer (2011), the management's financial incentives may be based on criteria that, for example, focus on the performance of an interdependent cluster of organizational units.

### *Synthesis of the literature*

As discussed above, many different types of management controls exist, and accounting information and performance indicators could, in many ways, support new service business development. At the same time, there are many peculiarities related to MA and control in globally operating companies, particularly in the context of servitization. Regarding service business development, not much is known about the actual utilization of MA and control. Thus, the following points were identified for consideration in the profitability management of service business in global operations.

- Equipment fleet information – overall view of the business potential
- Multidimensional organizational structure – interactions across heterogeneous units (e.g., product/service) at different levels (e.g., global/local)
- MA and control – understanding of the financial impacts at different levels (e.g., product/service category, market area, customer segment) and from different viewpoints

In response to the research questions of the paper, MA and control with several detailed performance indicators are required to comprehensively understand the current service business and the dynamics of its profitability. The analysis of the business impact of service actions may require data on the combinations of different product and service categories across business units and market areas. In particular, information about equipment fleets is required to understand the service business potential from a given viewpoint. A key issue in global operations is how the elements of MA and control relate to each other across organizational levels and units. In addition, it may be challenging to maintain a balance in considering the global and local perspectives when determining the business structures, accounting practices, and key performance indicators.

The utilization of MA and control is not, however, limited to the analyses of the current status; rather, it should yield information for selecting and steering the actions to be taken in service business development. A detailed understanding of the dynamics of the profitability potential could even yield a prioritized list of development actions. Altogether, servitization and new service business development may require rethinking the traditional views of business and the existing control devices. These aspects have not been previously examined in the literature.

## **Empirical findings**

### *Research methods and materials*

The study is based on an interventionist research approach (Jönsson and Lukka, 2006; Suomala et al., 2014) and conducted in close cooperation with a globally operating machinery manufacturing company. As is typical in interventionist research, active researcher participation in the real-life development project provided a good opportunity to not only observe the flow of events and reactions but also facilitate analyses and reflections on the basis of the material produced by the researchers. As a starting point of the study, the case company is interested in expanding its spare parts business, and thus they have, for example, introduced an online application for spare parts sales. In the study, there was a practical – yet also theoretically relevant – need to figure out how the business potential could be understood through MA information and performance indicators and how to select and prioritize spare parts business development activities. Although the company would have been able to produce such MA information without the contribution of external experts, the expertise and resources provided by the researchers catalyzed the project and underlined its importance inside the company's global organization, thus building access and increasing the likelihood of relevant and interesting findings. The possibility to leverage the expertise of interventionist researchers has been consistently recognized in the prior literature (see, e.g., Suomala and Lyly-Yrjänäinen, 2011). Hence, the interventionist approach was selected because, by building on interventionist strategy, the researchers could build the access to and in-depth visibility of the ongoing business development project, and there was a clear demand for support to solve real-life problems. To achieve the research objectives, the researchers were actively involved with the entire process of accounting development and used accounting-related interventions to facilitate improvements within the case company.

As Jönsson and Lukka (2006) observed, it is crucial for the interventionist researcher to obtain a thorough understanding of the current situation in the case company from the viewpoint of the theme of the study at the outset of the empirical process. This is vital for designing interventions that best facilitate both the practical progress of the development project and the theoretical inquiry. The main interventions were financial analysis, ideas for new performance indicators, and profitability scenarios. Actually, those interventions inspired many of the discussions with company people and led to the accumulation of empirical materials.

In addition to actual interventions, many other strategies were employed in gathering the data. Due to the exceptional access to rich company data, it was possible to use several methods of data collection and analysis, as illustrated in Table 1. In the beginning of the research project, a meeting was conducted with the key company personnel in order to discuss and define the guidelines for the project execution. The main contact person was the business unit's spare parts manager responsible for global sales. Additionally, the business unit's director of performance and components and the manager responsible for developing the services concept at the company level were involved in the kick-off meeting.

*-Insert Table 1*

First, a meeting was conducted with the main contact person to gain an understanding of the global business, organizational activities, challenges, and future development targets. To get a comprehensive overview of the long-term evolution of the business unit's profitability, the financial figures of the equipment and service business were analyzed for a five-year period (2010–2014). An extensive amount of raw data was gathered across different reporting lines from the company's data warehouse system and modified to fit the framework of the analysis. The financial information as well as instructions for interpreting it were obtained from controllers representing two different business lines. In addition, data were collected on the delivered equipment, for example, based on the reference lists generated from the company's customer relationship management system. When the preliminary analysis of the financial figures and equipment fleet was complete, a meeting was held with the key company personnel to gain insight into managers' perceptions and development ideas. Furthermore, requirements were defined for the content and the formulation of financial information as well as the recognized control challenges.

Empirical data were also collected by interviewing the persons responsible for spare parts sales in different market areas. The interviews were semi-structured, and the questions were sent to the

interviewees beforehand. As indicated in Table 1, it was possible to get information regarding the characteristics of all five market areas. One of the interviews was carried out face to face with the respondent, and data were collected through written notes taken during the interview. A videoconference was held with one interviewee who had prepared a presentation to support the interview session. With another respondent, the interview was conducted by phone and supplemented with written answers sent afterwards. Yet another respondent submitted comprehensive written answers, and thus no personal interview was conducted. The themes covered in the interviews were the market area characteristics of the spare parts business, sales channels, and the served equipment fleet. Additionally, the managerial possibilities and challenges related to the new online application were discussed. The findings from the interviews were presented, and targets for project completion were reviewed in a meeting held with the key company personnel.

Overall, the meetings with the business unit's spare parts manager responsible for global sales played a key role in this study, providing knowledge regarding the applicability of the outlined ideas. The ideas for new performance indicators were tested with her, and as the study progressed, this resulted in insights regarding the profitability scenarios of the online system. Finally, the findings of the project were presented and reflected upon in a global meeting with all the market area representatives and other key individuals involved in the research project. In practice, the meeting was carried out as a videoconference. Before the meeting, the findings of the project were reviewed and agreed upon by the spare parts manager responsible for global sales. Based on the project findings, there was an active discussion about how to redirect the spare parts activities to improve profitability by taking into account the characteristics of different market areas.

### *Case overview*

The case company is headquartered in Europe and has plenty of factories and offices around the world. At the moment, the company is organized around four business lines and in five geographical areas. Further, there are separate service units and regional units within the business units. In 2015, the service business generated 40 percent of the company's total revenue. However, the majority of the revenue of the business unit under study is still based on equipment sales. The company is serving hundreds of customers globally, and its own installed base can be calculated in the hundreds of units. Typically, the company sells a spare parts package to a customer in connection with the equipment

sale to ensure the proper operation of equipment during the warranty period. However, the majority of its business comes from the transactional sales of spare parts. In addition, spare parts are often included in the maintenance offerings and in long-term service agreements.

The sale of spare parts is organized by four country/sales companies located on three different continents. Differences in the responsibilities and functions of the spare parts teams lead to challenges in the higher-level management and control of the teams. One of the teams is closely tied into the maintenance function, which enables it to seek business solutions that optimize overall profitability. In one of the country/sales companies, spare parts sales are organized entirely differently than in the others, as the team is responsible for the spare parts sales of all business lines in a certain market area. Thus, they have to cope with different kinds of technical issues and require support from other spare parts teams and technicians outside the team. A characteristic of one team is that they are acting as a “hub,” which means that they are a point of contact for customers, but another team takes care of the actual work. In practice, this leads to internal business transactions and complicates the management control practices. The global sales are coordinated and managed by the team located in the company’s home country. Because the capital sales projects are also managed from the same local unit, they naturally have the best knowledge regarding technical issues and thus provide considerable sales support to the other spare parts teams. The problem is that beyond the existing financial reporting structure, it is not possible to generate comprehensive and consistent accounting information to steer the spare parts business activities due to the several interfaces and peculiarities. For example, the interaction between equipment deliveries and service activities does not appear within the current reporting system. In addition, there are no solid installed base data available in aggregate form to support the analysis of the business potential stemming from customers’ equipment fleets.

#### *From a general understanding to specific profitability potentials*

To produce the necessary information for assessing the spare parts business potential of the case company, several steps had to be taken. First, the challenges of management control practices that stand in the way of developing global spare parts business activities with new earning logics and more effective procedures had to be determined. As discussed in the previous chapter, the business structures of the company were studied, and the following challenges in the management control practices were identified:

- Organizational structure in which heterogeneous local units have different roles, responsibilities, and accounting practices
- Financial reporting practice does not encourage interaction between machine deliveries and service activities
- Key performance indicators do not capture the comprehensive performance of the business

To develop a general understanding of the current profitability potentials, an analysis was first conducted on the business unit's financial figures on both the market area and country/sales company levels. On that basis, it was possible to examine the role of equipment sales and different service elements sales in the success of the business in different market areas. Regarding this, an interesting finding was that the responsible persons in charge of the service business were not accustomed to examining equipment and service sales figures combined in the same report. They pointed out that these functions work independently from each other, and thus their efforts are not coordinated centrally.

Further, to estimate the business potential that the company has in its current equipment fleet, the financial analysis was supplemented with installed base information. The analysis of market area characteristics illustrated in Table 2 revealed that the business potential stemming from the equipment fleet varies significantly between the market areas. Thus, based on the analysis, it is possible to estimate whether an increase in the spare parts business profitability can be achieved primarily through sales growth or rather by reducing costs through a more cost-effective spare parts sales process.

***-Insert Table 2***

Within Market area 1, the installed base of the company's own equipment is relatively small, and the company has quite a high market share in the spare parts business. Thus, its strategic focus has been placed on competitors' equipment, meaning that it is now serving an equipment fleet that is approximately two times its own installed base size. It became very clear in the interviews that the company personnel are analyzing the business environment very carefully to determine the business potential of their own and their competitors' equipment.

In Market area 2, in turn, the business is largely dependent on its own installed base and large key customers. Presumably, this is at least partly due to the fact that the spare parts team is serving all the business lines, and in their business environment analysis, the focus is on customer-specific figures. Increased profitability can likely be achieved by acquiring new customers through equipment sales



and by reducing costs. It became evident in the interviews that especially in this market area, warehousing policies and procedures play a key role in making businesses successful. Thus, more effective sales processes and cost reductions through procurement process improvement and inventory management could be seen as a way to reduce costs.

As indicated in Table 2, one characteristic of Market area 3 is that the equipment fleet is large and diverse. However, there is no coherent view of the fleet and the business potential stemming from the fleet in the company. It was mentioned in the interviews that the two teams responsible for sales to this particular market area do not have sufficient resources to collect and analyze the data that could support the exploitation of business potential. In this market area, the potential to increase profitability arises from the equipment fleet and from more efficient ways of working. The company personnel indicated that there is considerable sales potential in the fleet that has not been fully exploited. Moreover, a high sales volume enables the company to achieve savings through more effective procedures in sales and procurement.

In Market areas 4 and 5, the equipment fleet is growing fast, and thus the potential to increase the profitability in spare parts sales stems mostly from the current and future equipment fleet. However, there are no local sales organizations, and daily business routines are handled by a spare parts team that is located geographically far away from the customers. Consequently, the business potential of the equipment fleet has not been fully exploited. It was highlighted in the interviews that in those two market areas, the teams are not selling actively but rather waiting and handling customer orders. Thus, in these market areas, a key issue is to reach the customers who have already bought equipment from them.

The final project meeting reviewing the results of the project revealed that the company personnel's perceptions of the market area characteristics were in line with the findings presented in Table 2. In this context, the discussion turned toward the ability to sell spare parts for competitors' equipment. The company people highlighted that a certain kind of sales approach is needed to take the market share from competitors' equipment. In practice, they have to offer modernizations to equipment manufactured by competitors at affordable prices, with the assumption that this will lead to spare parts sales in the future. This can be linked to the issues that were highlighted regarding service business development. First, to understand the business potential, there is a need to collect information on the competitors' equipment fleet. Second, this kind of sales approach requires interactions between maintenance and spare parts units. Finally, there is a need to analyze the financial impacts at different

levels and from different perspectives. It was highlighted that even though that kind of sales approach has improved the company's overall profitability, it does not appear to be an attractive strategy from the maintenance function's point of view.

### *Defining specific performance indicators to steer service business development*

The servitization initiative highlighted the need to rethink the performance measurement practices in the case company. Its current key performance indicators only reflect the performance of spare parts sales processes in terms of on-time deliveries and quotation lead times. Financial reporting, in turn, focuses on traditional units of analysis, such as product sales in market areas or the country/sales company level. In addition, when refining and validating the preliminary findings of the study with the company personnel, it became apparent that the financial performance of the market areas and country/sales companies' operations could not be analyzed directly based on data taken from the systems. Moreover, in the interviews, insights were obtained on the varying financial reporting practices and internal business transactions. Thus, to get more detailed and specific knowledge to redirect spare parts activities towards more profitable business, there was a need for the new kind of performance indicators illustrated in Table 3 as well as a more detailed analysis of the figures.

### ***-Insert Table 3***

To identify the undeployed potential of service activities, it was suggested that the equipment fleet information be utilized when measuring the current level and potential of the spare parts business in different market areas. First, as indicated in Table 3, spare parts sales were measured against the equipment fleet in different market areas. Second, the market share was defined by calculating the sales figures in contrast with the sales potential of each market area. The sales potential was estimated on the basis of the equipment fleet size and the potential sales per equipment. Potential sales per equipment, in turn, were determined based on the figures of the most successful market areas. In this way, it was possible to identify the theoretical market share for each market area. However, several challenges arose related to equipment fleet-driven measures since, at least in some market areas, the strategic focus is increasingly on competitors' equipment, and thus determining the fleet size is not unambiguous. Moreover, it was highlighted in the interviews that it is not always easy to determine the original manufacturer of equipment because of the long lifecycles, including rebuilds and modifications. Despite the recognized deficiencies illustrated above, the company personnel indicated

that the equipment fleet measures could provide insights into the type of actions and resources needed in different market areas.

Because the company is evaluating the business potential of new sales channels, it was necessary to measure the cost-effectiveness of the current spare parts sales activities, as described in Table 3. First, it was necessary to define how much each team generates in net sales per employee. The needed data were quite unambiguously and easily available in the systems. Second, the unit costs of the current order processing system were determined by calculating the personnel costs of the spare parts teams against the number of transactions. In this case, reprocessing the data taken directly from the systems was required because there is significant sales support between the teams, which does not appear in the figures. The data on internal transactions were analyzed and supplemented with interview data to determine the yearly output and required resources of the teams. The final meeting reviewing the results of the project showed an interest among company personnel in this type of approach and revealed that they have not previously defined this kind of metric.

In addition, it seemed that the measures reflecting the customer segmentation could provide insights into the nature of business transactions as well as supporting data for channeling the sales actions. Thus, the customer base of each market area was divided into three different groups according to annual purchasing volume, as illustrated in Table 3. The analysis showed that nearly the same logic applies in all market areas, meaning that a small number of customers generate most of the net sales. On the other hand, the majority of customers order only a few times each year. The company personnel indicated that a similar type of analysis was done previously for only one country/sales company. Thus, the analysis across all the country/sales companies provided them with new information about business transactions.

#### *Overcoming challenges and identifying the avenues to increase profitability*

Gaining a comprehensive understanding of the current spare parts business profitability and the characteristics of market areas with the help of new MA information and new performance indicators enabled the creation of scenarios for realizing the spare parts business potential, specifically in regard to the new online system for spare parts sales. While the online system is a channel to reach new customers and increase sales, it may also result in a more cost-effective sales process for spare parts and thus increase profitability. However, introducing the system entails significant costs in terms of

importing the customer-specific information into the system. Thus, estimating the business potential of the system requires assessment of the setup costs in relation to the gained monetary benefits.

Customer-driven performance measures indicated that it might be necessary to create different kinds of content for different customer segments. For customers who are buying large amounts of spare parts, it is worth creating a purchasing system that is more sophisticated than the one for customers buying only small amounts. Thus, the cost factors of setting up systems for different customer segments were examined. It was supposed that due to the new system, the order processing practices would change, as the customers would be taking charge of activities previously performed by the company. Moreover, it can be assumed that the efficiency of order processing depends on the customer-specific content in the system. For example, customers having the most advanced information available are able to buy spare parts directly via the system. The smallest customers, in turn, may only be able to send inquiries. Thus, the unit costs of order processing for different customer segments were defined based on the current performance indicators and assessments of the effectiveness of the new processes.

The analysis of the market area characteristics and the equipment fleet-driven metrics helped in assessing the achievable monetary benefits of the system. For example, assumptions were made regarding the number of existing customers that would have access to the system in the coming years. The number of new customers that could be acquired with the new system was also estimated. The main idea was that in market areas where there is significant potential in the equipment fleet and small local sales organization, the system would probably be a channel for reaching new customers. In contrast, the areas with a high market share would benefit from the system mainly due to the more streamlined order process. In turn, the metrics of customers' business transactions were helpful when estimating the annual amounts of orders for different customer segments. Overall, the profitability scenarios of the online system would not have been possible without a thorough understanding of the current state of the profitability and potential of the equipment fleet in different market areas.

## **Discussion**

Although there has been wide interest in service business profitability implications (e.g., Cheng and Shiu, 2016; Kohtamaki *et al.*, 2015), the need for more detailed and systematic profitability management has been highlighted in the literature (Laine *et al.*, 2012a; Araujo and Spring, 2006). Thus, the paper provides insights into a process where MA and control practice were examined and

refined in order to more comprehensively understand and capture the service business potential of global machinery manufacturers. During the process, several challenges regarding MA and control were identified and overcome, stemming from the complexity of the global operations, differences in MA practices, and the lack of accounting information from different viewpoints. This process paved the way for a more detailed understanding of the actual consequences of the selected service business development activities. Indeed, MA and control could support steering and controlling the profitability of a new service businesses, especially by providing a more comprehensive view of the business potential and identifying and prioritizing the possible avenues for realizing such potential. The profitability management of service businesses requires considering the equipment fleets, interactions in multidimensional organizations, and MA and control practices that can enhance the understanding of the financial impacts at different levels and from different viewpoints. More particularly, this paper focuses on the following research questions:

*1) How can service business potential be understood through MA information and performance indicators?*

This study shows that the analysis of service business potential with the help of MA information and performance indicators may require data on the combinations of different product and service categories across the complex global organization structures. Thus, it is suggested that MA can facilitate service business development activities through collecting and consolidating the scattered financial data. In addition, non-financial equipment fleet and customer base information is needed to gain a comprehensive understanding of the market area characteristics and service business potential from different viewpoints.

*2) How can service business development activities be selected and prioritized with the help of financial information?*

The paper highlights that in global companies, the development of service business is necessary to build on country/sales company- and market area-specific financial information and performance indicators because the circumstances may substantially differ across areas, particularly in regard to the equipment fleet and customer characteristics. Hence, this paper suggests that learning from differing local contexts with the help of MA information and performance indicators is crucial when seeking avenues to increase profitability. To assess and justify the profitability potential of new business activities, a company must intimately understand its current processes and the costs behind them. In

turn, metrics reflecting the customer segmentation and potential stemming from the equipment fleet could provide supporting data for channeling the business actions in different market areas.

Overall, the process examined in this paper can be used as a point of reference for profitability-driven service business development both in research and in practice. In other words, the paper responds to the academic and practical need for tools and techniques supporting service business development and servitization.

### *Theoretical implications*

First, based on Dent (1996), the financial reporting structure of the case company was analyzed. Based on that analysis, it was argued that companies' MA systems still tend to emphasize product-line reporting at the expense of recognizing the synergies between equipment and service businesses. However, in turn, the servitization literature (Kastalli and Van Looy, 2013; Oliva and Kallenberg, 2003; Gebauer et al., 2005) has strongly emphasized the linkage between equipment and service operations because equipment sales can be seen as a way to generate long-term revenues through different kinds of service offerings. Thus, an essential point of this paper is that to paint an overall picture of service business potential, the interactions between equipment and service activities should be acknowledged in financial reports as well as in management control. This study suggests that if the interaction does not appear within the financial reporting lines, a consolidation needs to be performed with MA information. Further, it is proposed that MA practices should be developed to more comprehensively and flexibly capture all the viewpoints that are needed to examine how various parts of a business would better fit together to improve a company's overall profitability.

In line with observations in the MA literature (Tillmann and Goddard, 2008; Lukka, 2007; Cruz et al., 2009), and as a contribution to the servitization literature stream, this study indicates that MA practices in global companies are often highly complex activities, which tend to require significant development to support the servitization initiatives under specific circumstances. More specifically, there are challenges stemming from the multidimensional organizational structure and differing MA practices in local units. In fact, this study suggests that the development of a global service business must be built on an analysis combining financial information and equipment fleet information across product lines and organizational units. Thus, the paper argues that servitization highlights the need for change in various forms (see, e.g., Lukka, 2007) in MA practices, and the initiative to change is likely to come

from outside the financial functions of the company. To contribute to the MA literature, it might be worth further studying how servitization has led to changes in the MA practices of machinery manufacturers.

This study supports previous literature (Flamholtz, 1983) that the organizational structure itself can be seen as an example of management control, highlighting that the lines of responsibilities and reporting may hinder various parts of a business from working together in a way that could improve the overall profitability of the company. Moreover, as suggested in the MA literature (Gupta and Govindarajan, 1991; Abernethy et al., 2004), this study illustrates that multidirectional flows of products, capital, and knowledge among various units have an influence on the nature of control in globally operating companies. Hence, it is proposed that higher-level management and control of local units should not be based solely on figures taken from the systems if the units are heterogeneous in terms of responsibilities and accounting practices. This is in line with earlier observations (e.g., Cruz *et al.*, 2011) that the harmonization of local practices may be difficult and unnecessary in the global environment.

The literature has indicated that there is a lack of measures reflecting the market performance of companies providing products and services (Kastalli and Van Looy, 2013). One of the main messages of this paper is that machinery manufacturers could utilize equipment fleet information more comprehensively when exploring the business potential of service activities. The paper proposes that companies could assess the business potential of service actions by measuring their figures against equipment fleets. Based on the equipment fleet information, it is possible to define indicators reflecting the market share and identify the undeployed potential of service activities (cf. Shulver, 2005). Thus, this study complements Laine et al.'s (2012a) suggestion that different kinds of metrics are needed in the service business renewal process, from the justification of the actions to the control of the results obtained.

Providing services requires machinery manufacturers to rethink their organizational principles, structures, and processes (Oliva and Kallenberg, 2003). It has been illustrated in this study that when a customer is taking charge of activities previously performed by the manufacturer, the value chain changes (see, e.g., Brax, 2005), and the costs of the processes may also change. In addition, this study supports the previous literature (Laine et al. 2012a) by demonstrating that justifying servitization requires the identification of the potential values and costs of changes from various perspectives. As highlighted by this study, manufacturing companies developing new kinds of service offerings need

measures that could help them to orient their actions according to different market conditions. This is in line with the literature (Araujo and Spring, 2006; Shulver, 2005), indicating that rather than increasing the variety of new services, companies should focus more on customers' needs and using comprehensive financial analysis as a starting point for service business development.

### *Managerial implications*

The approach presented in this paper provides managers of machinery manufacturers insight into how to overcome the challenges of MA practices that could be hindering them from gaining a comprehensive understanding of their service business potential. The paper suggests that the characteristics of equipment fleets should be considered when seeking avenues for service business development and for defining new kinds of performance indicators that could support such development. In sum, the paper highlights that the managers of global machinery manufacturing companies should take into account the overall profitability implications of development actions rather than simply focusing on their own areas of responsibility.

### *Limitations and implications for further research*

The findings of this study are limited to one case environment with a focus on the development of new accounting and control tools. Further studies should address the longitudinal evolution of MA and control in similar contexts. The generalizability of the findings could be enhanced by gaining evidence from more cases across different industries. However, the in-depth involvement with one case company provided a comprehensive understanding of the topic and identified the most relevant practical issues to study.

The paper suggests that one approach for measuring service business potential is to utilize equipment fleet information. However, the way to approach this matter has only been presented in general terms, and further validation of the proposed measurement method should be undertaken. Thus, further development of the performance indicators reflecting the business potential stemming from current and future equipment fleets is encouraged. Moreover, further research could consider, for example, how to exploit the LCC approach when estimating future service business potential.



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Date	Situation	Topic	Functions present	Data type
03/2015	Project meeting	Project planning	Spare part management, general management	Written notes
04/2015	Project meeting	Business overview	Spare part management	Written notes
04/2015	Project meeting	Financial figures	Finance, spare part management	Financial data, Written notes
06/2015	Project meeting	Analysis of financial figures	Finance, spare part management	Written notes
06/2015	Project meeting	Steering of results	Spare part management, general management	Written notes
08/2015	Project meeting	Financial figures	Finance, spare part management	Financial data, Written notes
08/2015	Interview	Market area characteristics	Spare part sales (market areas 3,4,5)	Written notes
08/2015	Interview	Market area characteristics	Spare part sales (market area 1)	Written answers
09/2015	Interview	Market area characteristics	Spare part sales (market area 2)	Written notes
09/2015	Interview	Market area characteristics	Spare part sales (market area 3)	Written notes
09/2015	Project meeting	Interview results	Spare part management, finance	Written notes
10/2015	Project meeting	Analysis of an online system	Spare part management	Written notes
11/2015	Project meeting	Steering of results	Spare part management, general management	Written notes
02/2016	Project meeting	Analysis of an online system	Spare part management	Written notes
02/2016	Project meeting	KPI measures	Spare part management	Written notes
03/2016	Project meeting	Results of the study	Spare part management, general management, spare part sales (market areas 1,2,3,4,5)	Recorded field notes

Table 1 Data collection methods

	Market area 1	Market area 2	Market area 3	Market area 4	Market area 5
Share of the equipment sale	< 5%	15 %	55 %	< 5%	25 %
Share of the spare part sale	30 %	25 %	40 %	< 5%	< 5%
Equipment fleet size	Medium	Medium	Large	Small	Medium
Market trend	Mature	Increasing	Mature	Increasing	Increasing

Table 2 Market area characteristics

Viewpoint	Level	Indicator	Data source
Equipment fleet	Market area	Net sales €/equipment Market share %	Financial figures, installed base information
Service operations	Country/sales company	Net sales €/employee Order processing costs €/order	Financial figures, business transactions, interviews
Customer logic	Market area	Customer base divided into groups based on their annual purchase volumes	Financial figures, business transactions

Table 3 Ideas for new performance indicators