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Management accounting roles in supporting servitisation: Implications for decision making at multiple levels

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Abstract

Purpose: The objective of this paper is to analyse the potentially supportive roles of management accounting (MA) in the servitisation of manufacturers.

Design/methodology/approach: The paper is a conceptual analysis supported by empirical examples.

Findings: The potentially supporting roles of MA are here connected to the process of justifying, defining, and controlling servitisation. The potential units of analysis for MA in such a process are explored by going through the different viewpoints regarding service. The actual roles of MA within the process are examined both conceptually and in light of empirical experience. The paper acknowledges MA as a social phenomenon, taking multiple roles in supporting decision making. Essentially, MA can be used as a source of restricting and enabling, and the roles of MA may range from that of “answer machine” to the subjective and interactive use of MA information.

Research limitations/implications: The paper represents a starting point for studying the variety of roles of MA in the servitisation process and it also outlines an agenda for further research.

Managerial implications: The paper examines a variety of roles of MA in servitisation. The discussion of the choice and enactment of the relevant accounting objects holds practical value.

Originality/value: The roles of MA in servitisation are discussed in more detail in light of the existing literature. Moreover, treating MA as a social phenomenon sheds light on the unaddressed sides of the control in the servitisation context. This supplements the existing service literature, which is dominated by mechanistic cost-system considerations.

Keywords: management accounting (MA); servitisation; service; accounting object(s).

Conceptual paper

1. Introduction

This paper discusses the justification, definition, and control of servitisation among manufacturers¹ from the viewpoint of management accounting (MA).² Firstly, recent

¹ “Servitisation” refers here to the process of an intended change by a manufacturer with the objective of increasing the importance of the service business in the manufacturer’s business. In practice, the share of service revenue and profit may increase or the servitisation may result in a rethinking of the business objectives of the manufacturer (or a part of the business of the manufacturer).

technological developments, which enable new services for the existing machinery fleet, and the growing interest of customer needs among manufacturers are stated as drivers of the servitisation process (Mathieu, 2001; Malleret, 2006). However, the justification of servitisation, based on the contextual factors in a given business environment, has not yet been thoroughly addressed (except by Wise and Baumgartner, 1999). Secondly, alternative scopes for service business and activities to realise the service business potential have been suggested (Oliva and Kallenberg, 2003; Penttinen and Palmer, 2007). For instance, the primary emphasis can be put either on the development of new service products (for example, maintenance and business advisory services) or on the development of customer relationships (that is, from transactions to partnership relationships). At a general level, these routes take time and require a strong awareness of the customers' businesses to be able to capture a new role in that business (Holmström *et al.*, 2010; Laine *et al.*, 2010). However, as Araujo and Spring (2006) stated quite reasonably, "Recent contributions suggesting that the balance should be swung towards services have shied away from examining why, how and when particular [products] should be deployed to address particular types of demand." This highlights the need for defining the service business, along with the objectives of a given company and choosing the primary actions.

Thirdly, regarding control over the service business consequences, despite the impressive results of the forerunner companies (for example, Dell, IBM, and Caterpillar, as seen in Mathieu, 2001), the servitisation process has quite often turned out to be challenging (Brax, 2005) and the expected economic consequences seem to have been only rarely achieved (Gebauer *et al.*, 2005). The 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. There seems to be a need for a set of managerial actions and supportive devices that fit and will support the process from the justification of the servitisation to the control of the gained results.

MA in general aims to support the managers in fulfilling business objectives through the processes of planning and control (Horngren *et al.*, 2006), thereby potentially filling the managerial gap outlined above. The use of MA information may take different roles during the process of servitisation, ranging from rough estimates for planning purposes to more exact calculations in order to control the business consequences (Burchell *et al.*, 1980; Chapman, 1997)³. The unit of analysis, that is, the accounting object, may range from network-wide analysis to company-, customer-, product-, and process-level analyses on a case-by-case basis.

In fact, only a few studies exist on the employment of MA in services, with a focus on the characteristics of the service context (Modell, 1996; Brignall, 1997; Chenhall, 2003). The existing literature focuses on a yet more fragmented set of themes, such as the characteristics of management control in different service settings (in terms of

² Management accounting (MA) refers to the production and use of financial information for (a variety of) managerial purposes within the processes of planning and control.

³ The different roles of MA in supporting managerial decision making have been widely discussed. Typically, the different roles of MA are connected to the level of uncertainty regarding the objectives and consequences in a decision-making situation (Burchell *et al.*, 1980; Chapman, 1997). The use of MA in an intended change has been addressed in the literature, typically at the company level (Abernethy and Brownell, 1999; Chenhall and Euske, 2007; Naranjo-Gil and Hartmann, 2007; Skaerback and Tryggestad, 2010).

the maturity and complexity of the products; for example, Auzair and Langfield-Smith, 2005); the characteristics of the cost systems related to different service processes (in terms of volume and variety; for example, Silvestro *et al.*, 1992; Brignall, 1997); and the employment of Activity-Based Costing (ABC) to analyse the value of the product for different customer segments (for example, Caru and Cugini, 1999), supported by a few recent studies on the measurement of the value of co-creation (Grönroos and Helle, 2010). Moreover, the majority of MA literature that focuses on service businesses is grounded in the IHIP characteristics of service (intangibility, heterogeneity, inseparability, and perishability; see, e.g., Modell, 1996; Brignall, 1997; Auzair and Langfield-Smith, 2005). So far, no decent link between the recent service conception (cf., Vargo and Lusch, 2004a; Grönroos, 2008; Heinonen *et al.*, 2010) and the MA literature on services has been established. Only a little is known about the potential roles of MA, particularly in the servitisation processes.

The objective of this paper is to explore and analyse the potentially supportive roles of management accounting (MA) in the servitisation processes of manufacturers. The paper takes an explorative stance regarding its topic and is primarily a conceptual analysis supported by empirical examples. The line of argument in this paper is built as follows: The potentially supporting roles of MA are here connected to the process of justifying, defining, and controlling servitisation. The potential units of analysis for MA in such a process, i.e., accounting objects, are explored by going through the different viewpoints regarding service: service logics at a corporate level (2.1); service at the product and customer levels (2.2); and the IHIP characteristics (2.3). In Section 3, the actual roles of MA within the process are examined through the framework of (Burchell *et al.*, 1980) on the roles of MA in different kinds of decision-making situations (3.1). The conceptual examination (3.2) is deepened with the help of empirical examples based on the experience of the authors (3.3). Finally, the implications of the findings and concluding remarks are presented in Section 4.

2. Relevant units of analysis for MA in servitisation

The process of justifying (Why do we desire servitisation?), defining (What does servitisation mean to us?), and controlling (How does the servitisation proceed/affect us?) servitisation is significantly affected by the choice of the relevant units of analysis. Recent MA literature calls for the examination of the active role of MA in the strategy of the companies (Skaerback and Tryggestad, 2010), thus supporting managerial work at multiple levels by enhancing knowledge about the business environment (Hall, 2010). As a result, if MA succeeds in reflecting the key business phenomena with the help of a set of relevant accounting objects, MA may be beneficial to the servitisation process.

In this section, we discuss the choice of units of analysis, which underlies the actual use of MA in servitisation. According to Belkaoui (1992, p. 25), the first step in accounting is that one chooses the accounting objects that are relevant for users of the MA information. In practice, the choice of the accounting objects is perhaps not self-evident or straight-forward. On one hand, the choice of accounting objects may reflect the traditional view of the business inside the company and the characteristics of the existing control devices (for example, product-costing in the ERP system). On the other hand, the context of change might require rethinking the business structure and the fundamental metrics within the business, which would, therefore, require the rethinking of the

accounting objects (for example, shifting emphasis from product costs to customer profitability).

The servitisation process may affect manufacturers at the corporate level, the customer relationship and product levels, and even at the levels of single elements of the business processes, therefore highlighting the need to continuously rethink the system of the accounting objects within the company. The changes at the corporate level need to be transformed into lower-level accounting objects, and the consequences at the lower levels may result in further changes at the corporate-level metrics. Moreover, besides cost, there may be a need for analysing the revenue and profit of a given accounting object (Hornigren *et al.*, 2006) and these needs may change during the servitisation process. In general, the choice and the use of the feasible accounting objects (for example, customers and products) and their contents (revenue, cost, and profit) could enable the companies to understand the effects of servitisation on the company from multiple viewpoints.

A challenge in the use of the relevant accounting objects in the servitisation context is that there is no consensus regarding the characteristics of service business. Indeed, many influential scholars have invited fresh perspectives in service research and new interpretations of the concept of service (Vargo and Lusch, 2004a; Edvardsson *et al.*, 2005; Grönroos, 2008) to better serve the emerging managerial needs in the area. The existing service interpretations may be divided into three levels, implying potentially different sets of accounting objects for servitisation: a) service logics at the corporate level (“service-dominant logic” (Vargo and Lusch, 2004a); “customer-dominant logic” (Heinonen *et al.*, 2010)); b) service as a solution for the customer at the customer and product levels (cf., Grönroos, 2000, 2008); and c) the IHIP characteristics as differentiators between goods and services (Shostack, 1977).

2.1 Service-logic as a perspective to the business: Changes in the beliefs systems

Taking a servitisation initiative quite often means the redefinition of the business logic of the manufacturer. The servitisation process may constitute a change in the “beliefs systems” (Simons 1994), referring to changes in the sources of revenues and profits and the basis for the management control systems of the companies. As a result, the accounting objects and metrics used by the manufacturer may require significant rethinking as well. Despite servitisation, the role of MA at the corporate level may still be a reactive one, with a focus on control over the consequences of the initiative. However, a need for a more proactive stance of MA towards strategy enactment has been proposed (cf., Skaerback and Tryggestad, 2010), which would, thus, include the (re)definition of a new initiative and the related accounting objects, as needed.

The recently introduced service logic typically operates at the corporate level and deals with the fundamentals of the desired change within companies. According to Vargo and Lusch (2004a), for example, “New perspectives are converging to form a new dominant logic for marketing, one in which service provision, rather than goods, is fundamental to economic exchange.” In their service-dominant logic, customer relationships, intangibles, and the co-creation of value with the customer form the basis of the business (Vargo and Lusch, 2004a). In this approach, service is the generic term (rather than the product) for giving benefit to the customer and represents a beliefs system in itself, both for academia and for the companies who follow this logic. In this vein, Edvardsson *et al.* (2005) concluded that no generally applicable definition for services exists. Thus, service logics are primarily corporate-level statements that are

transformed into lower-level accounting objects and related performance measures on a case-by-case basis.

One alternative for the operationalisation of the service logic, following Grönroos (2008), takes the idea of a customer-value-driven business even further by proposing that the customer is not only a co-producer of value, but actually the main value creator (Grönroos, 2008). Therefore, it is the customer who allows the supplier company to participate in its processes and not vice versa (Grönroos, 2008). In this vein, Heinonen *et al.* (2010) introduced the customer-dominant logic for service, where understanding customers' logic would enable an understanding of customers' "lives" and the (potential) roles of the products of the supplier company for the customer. Recent servitisation literature has revealed that the business of the customers is a solid basis for service-business development (Laine *et al.*, 2010; Holmström *et al.*, 2010), which increases the relevance of customer-dominant logic in the servitisation context.

As a result, the processes of value creation of the customer and for the customer should be emphasised (Grönroos, 2008; Heinonen *et al.*, 2010). One way to translate this idea into an accounting object is the adoption of the metaphor of a consolidated network (Laine *et al.*, 2006), in which the legally independent companies, such as the manufacturer and its customer, are treated as a consolidated corporation. The revenue of such an entity comes from the customer's customers, the costs are paid to external suppliers, and internal transactions are eliminated from the analysis. Such an analysis would reveal the value added as a whole in the entity (which is made up of the manufacturer and the customer) and the pricing of the internal transactions represents the profit sharing within the entity. As noted by Grönroos and Helle (2010), the actual analysis and development of the value creation within the consolidated network would require openness from both the parties involved. Moreover, the manufacturer should be able to produce an analysis concerning its customer portfolio in order to justify the servitisation strictly based on the customers' business. The overall value of the network-level considerations is dependent on the actual need for the information about the elements of profitability within the network, especially concerning the customer(s). In other words, the consolidated network approach could help the justification of servitisation only if the servitisation initiative is really supposed to affect the profitability of the customers and if the manufacturer obtains access to a reliable data set concerning the customers' profitability.

In practice, the servitisation initiative has most commonly been operationalised by measuring the share of revenue outside pure machinery sales (see, for example, Oliva and Kallenberg, 2003; Gebauer *et al.*, 2005). However, it is not self-evident that the share of after-sales service revenue actually reflects the beliefs and valuations underlying the servitisation strategy—for example, the chosen customer-dominant logic. Gebauer *et al.* (2005), for instance, used the rough limit of 30% of total revenue outside of machinery sales to suggest that, if the service revenue exceeds the limit, over half of the value creation stems from service activities. However, the service revenues of the manufacturers are dominated by spare-part sales and some basic maintenance services. Typically, performance contracts, where revenue is connected to the value-creation process that is actually successful, are restricted to a limited number of partnership relationships and, therefore, have a minor effect on revenues. Essentially, there is a need to choose a set of lower-level accounting objects and related objectives to define and control servitisation.

2.2 Service at the product and customer levels: New products and new relationships

The servitisation initiative can be operationalised from corporate-level statements into lower-level accounting objects (and related metrics) to influence the behaviour of individuals in different roles. How and when certain accounting objects are used in this operationalisation is case-dependant. Typically, the profitability of a company can be calculated as a sum of the profitability of the business units (BUs). The BUs are typically defined as responsible for a certain product category (manufacturing units and service units) or a customer segment (e.g., based on the customer industry). Within the business units, there is a need for the analysis of product- and customer-level costs, revenues, and profits. The organisation structure does not, however, straightforwardly lead into a set of profitability objectives for different product or customer categories. The service business may be justified (and controlled) by showing the direct profitability of the service activities (high profitability of the spare part sales and maintenance) or by identifying the indirect benefits of the service activities, such as learning from the customers (Laine *et al.*, 2010) and long-term customer relationships (Mathieu, 2001).

Building on the idea of two alternative routes of servitisation (cf., Penttinen and Palmer, 2007), the servitisation initiative could focus either on desired new products or on desired new kinds of customer relationships. Analysing the (potential) values and costs of the new products and new customer relationships could enable the definition of the desired consequences of the new business logic. In MA terminology, this service viewpoint could refer to a product- or customer-relationship-level accounting object that would consist of activities and underlying resources and that would result in desired outputs and outcomes for the customer. The profitability of such an entity could be calculated with the help of the revenue and the costs assigned to the accounting object.

First, if servitisation is interpreted primarily through customer relationships (Grönroos, 2008; Heinonen *et al.*, 2010), service business means customer need fulfilment in line with the activities undertaken by the customer. The customer pays for need-fulfilment according to the contracts set with the manufacturer and this revenue may be compared with the activity costs related to this customer relationship (cf., Caru and Cugini, 1999), which would reveal the profitability of the customer relationship. However, customer satisfaction is not directly connected to customer profitability; there are also relationships in which the manufacturer needs to undertake many resource-intensive activities to meet customers' needs (see Storbacka *et al.*, 1994; Kaplan and Atkinson, 1998). Therefore, the portfolio of the customer relationship requires case-by-case analysis to reveal the mechanisms underlying their profitability.

Second, if servitisation represents new kinds of products, there is a need for analyses of the products and underlying business processes. Such analyses have also been significantly present in recent service literature (see, for example, Möller, 2010; Ehret and Wirtz, 2010). The activities, underlying resources, and gained outputs and outcomes may take different forms in each case (Morris and Johnston, 1986; Laine, 2009; Möller, 2010). Briefly, the customer value is facilitated through the provision of a set of inputs, activities, and outputs ("products"). In the real-life processes, multiple forms of inputs/outputs exist, such as goods, people, information, energy, and rights, with varying emphasis on a single element. Sometimes, emphasis is put on selecting a spare part of the right quality, whereas on other occasions the personnel-intensive procedures underlying the spare-part delivery demand the most attention from the parties involved.

Interpreting value creation through customer relationships, products, and process terminology includes an explicit connection to the ABC vocabulary (Kaplan and Atkinson, 1998), which helps in the connection of the examined-service aspect to the related accounting objects. In the ABC, the costs of the resources are allocated, through the activities, to higher-level accounting objects, such as products and customer relationships (Kaplan and Atkinson, 1998; Sievänen *et al.*, 2004). The analysis of the values of those products and customer relationships deserves further attention to understand the business consequences of servitisation initiatives: How is the value passed on or facilitated to the customer in the new logic? What kinds of products and customer relationships are desired for value facilitation? What kinds of processes and process outputs would precede this value facilitation? What are the key performance indicators for those products, customer relationships, and business processes? The answers to these questions are case-dependent. In this paper, we focus on the examination of the potential roles of MA in addressing such questions.

2.3 IHIP characteristics: New elements in the product offerings

For manufacturers, servitisation may yield changes not only in managers' mental models and at the product and customer-relationship levels, but, significantly, also in the key resources, processes, and process outputs/outcomes. This might also require identifying the relevant accounting objects within new (or refined) processes.

The characteristics of the (traditional) service processes and their implications for MA practice may also become of importance when discussing the management of the servitisation process at the level of single processes and process elements. Typically, when referring to service characteristics, scholars refer to Shostack (1977), who described the recognised differences between products (goods) and services primarily from the viewpoint of marketing management. Before that, Rathmell (1966) was already questioning the distinction between goods and services. He highlighted the fact that people use technocratic terms when talking about goods, while services are described with humanistic terms, which also gives the impression that not only the process content, but the mental model through which it is approached, are of great significance. Indeed, in the context of servitisation, the customer may buy "a feeling of reduced risk" or "increased machinery availability" instead of a machine as such, thereby revealing the potential importance of the new process elements underlying these new product interpretations.

Existing MA literature in the service context is grounded in the study of IHIP characteristics. However, the adoption of IHIP characteristics as the (only) definition of service provides a misleading starting point for studies on MA in the service context. First, over the last decade, IHIP characteristics have frequently been criticised for the complexity and subjectivity of the variables (Lovelock and Gummesson, 2004; Vargo and Lusch, 2004b). In fact, each of the IHIP characteristics requires further study to be understood and properly used. Intangibility, for instance, is a multifaceted concept, which is divided into immateriality and the abstract character of a process (Laroche *et al.*, 2003). Second, from the viewpoint of MA, IHIP characteristics can be connected to the elements of the business processes, for example, to the intangibility of certain resources or to the heterogeneity of certain activities and outputs. These characteristics would result in some challenges in terms of the cost of the system design (cf., Brignall, 1997) because, for instance, the standard costs may not reflect the heterogeneous nature of the processes.

In the servitisation context, however, IHIP characteristics merely represent lower-level process characteristics and do not necessarily affect the overall business logic adopted by the company. Therefore, they have a limited effect on the most influential roles of MA in this context. Instead, the potential influence of the IHIP characteristics on MA lies primarily in the process analysis (see, for example, Modell, 1996; Brignall, 1997) and is not, therefore, discussed further in this paper.

3. Discussing the roles of MA in servitisation

In this section, the potential roles of MA in justifying, defining, and controlling servitisation are further discussed. The examination is based on the identification of the relevant accounting objects for servitisation (Section 2) and the existing research on the roles of MA in different decision-making situations (primarily within the framework of Burchell *et al.*, 1980). As the overall uncertainty regarding the servitisation initiative (objectives and consequences) decreases over time, the desired roles of MA as well as the MA's ability to support the servitisation evolve. The variety of the supportive roles of MA is elaborated further in the rest of this paper. In Figure 1, the three service viewpoints and the related accounting objects are associated with the potential roles of MA in servitisation.

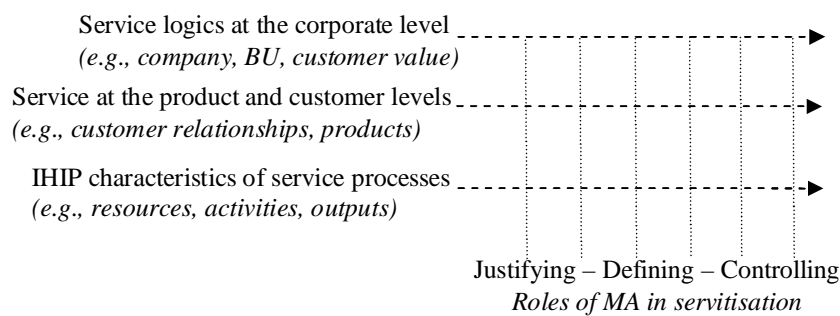


Figure 1. Roles of MA in servitisation and relevant units of analysis.

As conveyed in Figure 1, the tasks of MA do not necessarily follow each other in a linear servitisation process, but controlling the early business consequences may lead to the refinement of the servitisation process and to changes in its justification. Moreover, during the servitisation process, new information about the business consequences may lead to changes in MA, giving an idea of MA that is intended to respond constantly to the needs of its business context (see, for example, Burchell *et al.*, 1980; Henri, 2010).

3.1 The roles of MA in different decision-making situations

The decision-making situations at hand and the choice of the units of analysis for those situations give a structure for the (variety of) potential roles of MA in servitisation. In the MA literature, it is acknowledged that there are both technical (accounting methods, accounting objects) and behavioural (social phenomena) aspects to MA activities (Burchell *et al.*, 1980; Chenhall and Euske, 2007). Within the overall role of MA in planning and control activities, there are different types of decision-making situations that would benefit from different types of MA enactment (Burchell *et al.*, 1980; Chapman,

1997). Recently, it has been proposed that, besides exact answers, MA should primarily support managerial work by enhancing awareness about the business environment (Hall, 2010), thus highlighting the importance of the behavioural roles of MA. Essentially, the relative uncertainty regarding the objectives of the decision and regarding the consequences of the actions taken tend to vary across decision-making situations, which has been used as a basis for the widely used framework for the roles of MA in different decision-making situations (see Figure 2).

| | | <i>Uncertainty over the objectives for action</i> | |
|--|----------------------|---|--|
| | | Relative certainty | Relative uncertainty |
| <i>Uncertainty over the consequences of action</i> | Relative certainty | ANSWER MACHINES | AMMUNITION MACHINES |
| | Relative uncertainty | LEARNING MACHINES | RATIONALISATION & INSPIRATION MACHINES |

Figure 2. Roles of MA (system) in decision making (adapted from Burchell *et al.*, 1980; Hopwood, 1980; Chapman, 1997).

Firstly, when there is low uncertainty over both the consequences and the objectives of the action, MA works as an “answer machine”; for example, it may offer answers concerning the actual share of revenue outside the machinery sales (compared to the objective). Secondly, if the consequences of an action with a certain objective are relatively uncertain, MA could play the role of a “learning machine.” In other words, an understanding of the actual consequences is gained during the process of change, which in the servitisation context could mean, for instance, an understanding of the effect of customer retention on customer profitability (cf., Storbacka *et al.*, 1994).

Thirdly, in any organisation there are competing aims and objectives and MA can be used to translate these viewpoints into accounting figures. Therefore, when uncertainty over the consequences of actions is relatively low and over the objectives for the action is relatively high, the role of MA could be to work as an “ammunition machine,” for example, by simulating the consequences of an increase in after-sales revenue for the revenue and costs to the company at different levels. Fourthly, according to Hopwood (1980), MA can also play a significant role without an exact business objective. In these cases, MA may be used to legitimise decisions that have already been made. Yet another use of MA in cases of relatively high uncertainty would be the search for inspiration through the employment of new accounting objects (for example, a consolidated network that exceeds the traditional company boundaries).

The framework proposed by Burchell *et al.* (1980) is widely acknowledged in the MA literature (Chapman, 1997). Recent MA literature still calls for an active role of MA (and the accountants) in managerial work in general (Hall, 2010), in the strategy enactment of the companies (Skaerback and Tryggstad, 2010), and in the development of the MA system to meet the evolving requirements of the business environments (Lukka, 2007). Burchell *et al.*’s (1980) framework has not been significantly elaborated further, but the idea of it still remains valid in the literature and, therefore, it represents a solid starting point for examining the roles of MA in a new context. In Section 3.2, the roles are studied conceptually through the tasks of justifying, defining, and controlling servitisation. In Section 3.3, this examination is deepened through empirical examples.

3.2 The roles of MA in justifying, defining, and controlling servitisation

In this paper, the MA activities of servitisation are divided into justifying, defining, and controlling the servitisation process. As noted, these tasks do not necessarily follow each other in a linear fashion, but controlling the early business consequences can lead to the refinement of the servitisation process and changes in its justification. Typically, the overall uncertainty regarding the objectives and consequences tends to decrease during the process and the roles of MA in the process should evolve. Moreover, the emphasis on the different levels of accounting objects may vary as the servitisation process proceeds; for example, company-level objectives might translate into product-level targets and, eventually, the acquired consequences at the product level might be aggregated back into the company level. Table 1 conveys a tentative set of roles of MA in servitisation.

Justifying servitisation in a given context requires the identification of the potential values and costs of such a change from various perspectives. Servitisation is not by any means a self-evidently correct path for business development, but managers should be able to assess servitisation against other strategic alternatives and identify the reasons (if any) for the servitisation process within the company. In this case, the objective for the servitisation may not yet have been clarified, but the simulation of the business consequences from different perspectives may help to identify the content of the servitisation process in a given context. Therefore, the most applicable role for MA could be to serve as an “ammunition machine” (Burchell *et al.*, 1980), unless more profound analyses and sources of inspiration are needed at the front end of the process. It is case-dependent, whether an active role is accepted for MA activities or whether MA provides information on preselected alternatives (Skaerback and Tryggestad, 2010).

Table 1. The potential roles of MA in justifying, defining, and controlling servitisation.

| Management accounting tasks | Service-logic viewpoints | Service as customer relationships and products | Service as process characteristics |
|-----------------------------|--|---|---|
| Justifying | Inspiration: How would servitisation change our business? Ammunition: How does this strategy differ from other alternatives? | Ammunition: What kinds of products and customers are desirable? (Why?) | Ammunition: What are the alternatives for managing the changes in the operations (Make or buy? New process, resources?)? |
| Defining | Inspiration/ammunition: How would servitisation change the company or its customers? Are the changes different among business units? | Ammunition: What kind of customer and product portfolio is desired to fulfil the servitisation? | Ammunition: What are the current processes and what are their values and costs? How should they be changed? |
| Controlling | Learning and answers: How will the objectives be met? (Company-level revenue; costs; profits; qualitative metrics.) | Learning and answers: How will the objectives be met? (Customer/product-level revenue; costs; profits; qualitative metrics.) | Learning and answers: How will the objectives be met? (Activity/process-level revenue; costs; profits; qualitative metrics.) |

Justifying the company-level service logic may be connected to some of the elements that drive the servitisation, such as extra revenue, steadier cash flow, and better profitability (Wise and Baumgartner, 1999; Mathieu, 2001; Brax, 2005). The mechanisms underlying such benefits should be examined critically, including against other strategic

alternatives, such as the further development of the existing role as manufacturer. In such a comparison, MA could help in the translation of the company-level business phenomena into the desired consequences at the customer and product levels (Chapman, 1997) and could take the form of a single calculation or a set of alternative viewpoints (see short and long translations in Mouritsen *et al.*, 2009). For instance, the customer relationships could be viewed as investments. By extending the product offerings, the manufacturer could gain a new status as a value/productivity partner in its customers' processes, which, in turn, increases customer retention and profitability (see, for example, Storbacka *et al.*, 1994), revealing a set of business consequences of the actual business processes. However, another alternative suggested in the recent MA literature (see, for example, Davila, 2010) is to supplement (or replace) the strict justifications of new types of customer relationships, for instance, by considerations that focus on the mechanisms that support inspiration and creativity in developing and managing such relationships. Instead of aiming at reduced uncertainty by restricting decision-making situations, the MA tools should reveal opportunities that can inspire the decision makers. As Davila (2010) concluded, MA activities should maintain a balance between freedom and routine.

Defining the actual content of servitisation in a given context in terms of the accounting objects is not a trivial activity. Contingency studies (see Chenhall, 2003) offer some (albeit rather loose) associations between several contingency factors (size, strategy, culture, etc.) and the scope and content of the expected controls. Contingency studies, therefore, help us to understand at a very broad level that various things seem to correlate with the selection of accounting objects; however, on the basis of contingency research, how the choice of accounting objects is specifically driven by and influences the business management and eventually contributes to performance remains unresolved. If we were pursuing more normative ideas on accounting objects, we could ask: "How can we use certain accounting object designs to actively support the recognised organisational aims or decision-making needs?" In other words, it seems reasonable to take a closer look at the interface of accounting objects and management by building on what Burchell *et al.* (1980) already demonstrated when they framed accounting as a constitutive practice (not just a quantified image of reality).

In general, the definition of the content of servitisation should be company-specific; no exact definition can be derived from the service viewpoint of the literature (cf. Edvardsson *et al.*, 2005). In each case, the implications of servitisation should be defined for different business units and, perhaps more importantly, for different customer segments and product categories. It is noteworthy that, even after the servitisation process, there still remain different types of customers, but the emphasis on those customer segments may change, perhaps representing a need for changes in the product portfolio as well. Essentially, there are a variety of definitions of service logics, initiated by Vargo and Lusch (2004a), which are meant to serve as a basis for defining servitisation in a given context. If a company, for instance, adopts the customer-dominant logic for service, as suggested by Heinonen *et al.* (2010), the profitability (or value) facilitated to the customer would also need to be measured and controlled (see also Grönroos and Helle, 2010). However, many companies are still unsure of whether they are willing to go that far in the customer process (and, consequently, lose part of the profits of their spare-part business). It is also unclear which companies would allow a company that was previously interpreted as a machinery manufacturer by its customers to have a more significant role. Therefore, the MA information should translate the

alternative definitions into accounting objects to show the benefits and risks associated with each definition (ammunition machine in Burchell *et al.*, 1980).

Thirdly, regarding *control activities*, there is, of course, the need to use a feasible set of accounting objects to measure the actual revenue, cost, and profit related to the servitisation initiative. The measurement should be made against the objectives set for the process. At the same time, however, the evolution of the performance measurement and control systems should be acknowledged (see, for example, Henri, 2010). In general, there is a need to assess continuously the control mechanisms, such that they reliably convey the scope and content of the change. According to the MA literature, change in control emerges through the interplay between the formal and informal control domains (Burns and Scapens, 2000). In brief, the new forms of control can be introduced as informal extensions of the control system (Lukka, 2007). Some of these controls are refined and institutionalised as the change—servitisation—proceeds.

Due to the variety of potential interpretations of servitisation and its consequences, an active role for MA may easily be suggested to help communicate the desired change. Chenhall and Euske (2007) recognised the more active role of control in the change processes by analysing two companies with very similar missions and strategies. As a result, they made a distinction between four types of interventions that may take place at different stages of the change processes: commanding (formal structures); engineering (processes); teaching (beliefs); and socialising (relationships) (cf. Simons, 1994). Therefore, besides the measurement of the outcomes of the servitisation, there should be room for learning from the actual results and any surprises during servitisation. The process of learning (cf. Burchell *et al.*, 1980) may help the company to continuously refine the servitisation and its execution if MA information helps the company to assess the process at multiple levels.

3.3 Discussing MA roles in servitisation through empirical examples

In this section, the actual roles of MA in servitisation are further examined. The examples are based on the experiences of the researchers of different servitisation processes (2003-2011). The examples primarily represent the context of a machinery manufacturer that aimed for servitisation, but there are also implications for other business environments. The examination is divided into the processes of justifying, defining, and controlling the servitisation, with an emphasis on case-specific challenges.

Firstly, regarding *the justification of servitisation*, a global machinery manufacturer aimed to increase its service business due to the maturity of the machinery markets and the decline in the margins of the machinery sales. Already in 2003, the after-sales revenue was over 40% of the total revenue of the company.⁴ At this point, the researchers were asked to examine the after-sales business potential (spare parts and maintenance) to attempt to justify servitisation more widely across the organisation. Therefore, the researchers analysed the after-sales revenue among different customer segments and across all market areas. Moreover, the cost of the after-sales activities was estimated based on the sample of cost structures in the market areas because the cost system did not support specific analysis. This, therefore, enabled the analysis of the

⁴ The share of the after-sales revenue would indicate an advanced manufacturer in terms of the scale introduced by Gebauer *et al.* (2005). However, in this environment, the wider process of servitisation to change the identity of the company as a whole had barely begun.

average after-sales profit (revenue minus cost). Finally, the market share of the spare-part sales was estimated in each segment and in each market area to gain estimates on the business potential of the after-sales service in terms of extra revenue and profit. For instance, the researchers asked what the profit impact of a 20% increase in the market share of the after-sales activities within the active fleet of the company would be. Some sensitivity analyses were also carried out regarding the selective increase in the after-sales revenue in certain areas among certain types of customers.

Although the analysis resulted in estimates regarding the business's potential, the steps necessary to realise this potential remained unknown. Based on the analysis, alternative scenarios were built upon the objectives and primary activities required to reach those objectives, which represented the role of an ammunition machine (Burchell *et al.*, 1980). In brief, it was noted that different customer segments had different business potential and, as such, the increase in market share could be gained through different approaches. Certain strategic partners might have been interested in performance contracts and there were companies in certain areas who were not yet even aware of the after-sales product of the company. Moreover, it was highlighted that the current spare-part sales might have been more profitable than the potential because the market share was bigger. Therefore, as noted by Anderson and Narus (2003), one should selectively pursue after-sales business with the different types of customers.

It is noteworthy that the analysis of the after-sales business was not enough to understand and justify the need for servitisation within the company. On one hand, the spare-part sales and maintenance services already represented business-as-usual for the company. On the other hand, a greater potential was identified in the application of new service concepts and technologies, especially if those technologies were used to change profoundly the business of the company. The researchers were involved in projects that focused on the development of an extended warranty product and remote technologies (2004-2008). During this process, it was noted that there was a remarkable potential to increase the awareness on the part of the customers of the actual use of the machinery with the help of the concepts under development. For example, if the customer bought an extension of the warranty period for a fixed price, the customer allowed access to the machinery manufacturer to its process for a longer time, thereby enabling the machinery manufacturer to learn from the customer's business. Similarly, the remote technologies that collect data about usage hours, outputs, and maintenance of the machinery would enable learning from the actual lifetime of the machinery among the customers and the machinery manufacturer could refine its product offerings to better fit the context.

The researchers were asked to analyse the costs and potential revenue of the concepts under development. This analysis revealed only limited direct potential connected to the sales of the warranties and remote services. However, the indirect effects as described by the researchers, were undoubtedly more important and many implications were identified in the research and development (R&D), operations, sales and marketing, and after-sales functions. These analyses serve as a source of inspiration (Burchell *et al.*, 1980, in line with the ideas of Davila, 2010). In fact, no monetary impact was identified, only mechanisms. However, with the focus only on the "spare-part potential," the management was not able to base its decision on a comprehensive understanding of the variety of potential impacts of servitisation.

In one case-study environment, the role of the manufacturing company in its customer's business was discussed as a basis for the servitisation initiative. In other

words, the business of the manufacturer was supposed to be grounded in the customer's business logic (Heinonen *et al.*, 2010), which is also in line with the idea of the consolidated network (Laine *et al.*, 2006). In such a case, besides its own profitability, the manufacturer would need to understand the mechanisms of profitability amongst the customers. In this environment, a business game using the customers' businesses was developed and used by the researchers, together with company representatives, as a learning device to understand the (potential) role of the manufacturer in the customers' businesses. Altogether, the concept was used more than 10 times with over 100 company and customer representatives, to explore and analyse the current and potential roles of the manufacturer in its customers' businesses. This was done with the help of the income statements and balance sheets produced during the business game, revealing yet another alternative for supporting the justification of servitisation with the help of MA information. In sum, the task of MA is to support the choice of servitisation from a number of other alternatives by providing analysis, and perhaps inspiration, from multiple viewpoints (cf. Davila, 2010).

Regarding *the definition of the content of servitisation*, the management should continually refine the content of the servitisation initiative as new information emerges. Based on the experience of the authors, the servitisation process may change both the scope and the content of the budgets and other controls of the manufacturers. Obviously, the beliefs system underlying a servitisation initiative cannot easily be transformed into budget figures, such as an increase in the after-sales revenue. Therefore, the management would need to understand the meaning and consequences of servitisation at different levels of the organisation to support its managerial work (Hall, 2010).

Indeed, there can be significantly different interpretations of the meaning of servitisation. In one case-study environment, for some managers, after-sales services were the primary source of service revenue and they expected a substantial growth in after-sales revenue was expected. However, some managers focused narrowly on new service concepts, resulting, for instance, in business advisory services being provided to the customers. Typically, those services are still provided free of charge (cf. Malleret, 2006). Only a few change agents were ready to promote a wide change in the organisation to create a new role in the customer's business, partly based on the opportunity to understand the customers' businesses more thoroughly. As a result, the variety of expectations for service business may result in a variety of desired implications at the levels of the customers, products, and processes. Moreover, the chosen control devices should be in line with the adopted definition for servitisation to enhance the process and move it toward the shared goals. In this case, the role of MA could be to find ways to transform each of the interpretations into economic targets (ammunition) to define servitisation in this context. However, the most desired choice should not be the one with the least uncertainty, but the one with the highest potential. Otherwise, the MA information would easily highlight just the spare-part potential because it typically represents the most profitable business area (Johansson and Olhager, 2004).

Besides the economic targets, the definition of servitisation may lead to other control mechanisms, such as organisational structures. These control devices may be significant in their ability to make initiatives visible to company representatives (see Burchell *et al.* 1980). As an example of a typical organisational evolution, first, as after-sales revenue increases, this part of the business is separated as an after-sales division. In this structure, all the product divisions are measured separately and the (high)

profitability of the spare parts is typically highlighted. In this structure, the problem of sub-optimisation may hinder communication within, and the economic results of, the company as a whole. Second, to proceed further towards the service logic with an emphasis on long-term customer relations and customer-value aspects, the organisations may be restructured by establishing customer segment divisions. These new divisions aim to become system suppliers for their customers by combining machinery and related services into a system that is provided to the customers. The profitability of the customer segments and the mechanisms underlying them become of interest to top managers, thereby raising the need for new accounting objects. After such an organisational change, the importance of the customer profitability increases at the cost of the product-costing and product-profitability analyses. As a result, importantly, the spare-part sales as a “money-maker” would turn into a lower-level accounting object that would be part of the more important entity of the customer relationship.

Regarding *the control over the consequences of servitisation*, there are obviously many roles that the MA may take, ranging from the production of exact metrics regarding the new business areas to facilitating learning about the actual consequences of the new initiative among the parties involved (cf. Davila, 2010). At the company level, control over the consequences of servitisation is extremely difficult to maintain, even if there is an exact objective for the increase in the after sales, for instance. In the case environment, machinery sales increased dramatically in 2006-2008 due to the economic boom. As a result, the share of overall sales taken by after-sales could have temporarily decreased, even if the absolute figures were growing. On the other hand, following the depression of 2009-2010, the share of the after-sales increased in terms of company revenue due to a significant decrease in investments in the major market areas. It may, therefore, take many years to understand the consequences of servitisation (cf. “learning device” in Burchell *et al.*, 1980) and the figures are essentially affected by economic cycles, organisational restructuring, acquisitions, and many other things.

However, there is still a need to control the business consequences of servitisation at the levels of the relevant accounting objects. One opportunity is to focus on the level of customer relations. In the case study, customer-segment analyses were conducted during the servitisation process to highlight the elements of profitability across the customer segments. It seems worthwhile to explore the current status of the customer relationships in light of the new metrics derived from the servitisation, such as the length and the strength of the relationships, by means of an informal analysis (cf. Lukka, 2007). However, building formal procedures for such an analysis takes time and needs to be constantly refined to fit into the overall control system of the company.

Another alternative is to enable and control the development of the new service business by means of MA. MA could also help in profitability estimates for the forthcoming product offerings and the uncertainty will be reduced as the project and the business area matures (cf. Nixon, 1998; Jørgensen and Messner, 2010). At an early phase of the servitisation, with limited experience of the actual business consequences, MA information could serve as a source of learning by providing a common language for discussing the main objectives and the contents of the new products. In the case of the extended warranty, for instance, there were two separate objectives for the project, which represents the ambiguity of servitisation and the role of this new service product in it. One of these objectives focused on the direct revenue from the warranty concept, whereas the other highlighted the learning opportunities from the customers’ business. During the

long-term process of development (2004-2009), there was analysis both of the profitability impacts of the extended warranty and more qualitative illustrations regarding the learning outcomes of the concept. The product was launched in spring 2009 and it has been surprisingly successful in light of both objectives. The revenue and profit of the company have, quite naturally, been measured as an “answer machine” (Burchell *et al.*, 1980), whereas the learning outcomes need more qualitative approaches. It is noteworthy that these have not been measured, due to the short history of the product in the market.

In sum, there are multiple potential roles of MA in servitisation. It is noteworthy that the use of the MA as an answer machine typically restricts exploration during the process of servitisation, which quite often represent a major change in the organisation with significant uncertainty. Acknowledging the wider and more active role of MA, for example as a source of inspiration, a source of alternative viewpoints, and a learning facilitator, could be beneficial for the justification, definition, and control of the servitisation process (Burchell *et al.*, 1980; Skaerback and Tryggestad, 2010). It is, however, too early to draw conclusions regarding the desired “MA toolbox” for servitisation, but the different roles of MA discussed above represent potential tools for MA in this context.

4. Concluding remarks

In this paper, the roles of MA in justifying, defining and controlling servitisation were discussed in more detail, providing managers with information regarding the service business potential and the process of servitisation in a given context. Firstly, the paper sheds light on the choice and enactment of the relevant accounting objects, which in its simplicity offers managers a sound starting point for planning and controlling servitisation (cf. Belkaoui, 1992) and perhaps helps managers avoid disappointments regarding the servitisation process (cf. Brax, 2005; Gebauer *et al.*, 2005).

Secondly, regarding the enactment of the accounting objects and MA, the findings of this paper support the idea that there MA has a variety of potential roles at different phases of servitisation. Essentially, the framework of Burchell *et al.* (1980) that was used in this paper encourages extending the role of MA from an answer machine to more interactive and subjective roles that will provide alternative viewpoints, learning opportunities, and inspiration (this is supported in the recent literature that calls for more active role of MA in managerial work at different levels: Davila, 2010; Hall, 2010; Skaerback and Tryggestad, 2010). In practise, the principal role of MA is in decision-making situations during the servitisation process. In these situations, the role of MA is to translate the decision-making situation into a manageable set of accounting objects that can reflect the pertinent viewpoints to be taken into consideration. Here, as a major managerial implication, there are at least four aspects that guide managers in choosing a reasonable MA approach at different phases of the servitisation process:

- How is the MA information used in the decision-making situation (answer machine vs. subjective/interactive roles)?
- What are the chosen accounting objects (a company; a customer; a product)?
- What are the viewpoints towards the accounting objects (cost; revenue; profit)?

- What is the timeframe for the decision and for the delivery of the MA information (*ex ante* vs. *ex post*)?

In line with the existing literature, interactive control methods are preferred in the early stages, whereas strict boundaries may be needed later (cf. Chapman, 1997; Auzair and Langfield-Smith, 2005). Furthermore, it is important to notice that the chosen control devices should constitute a coherent control package at all levels of the company. In general, the servitisation initiative should be transformed into reasonable controls. They must be reasonable not just in terms of their content, but also in terms of the use of these controls, leaving room for the potential enablement of these controls, as promoted in the recent literature (cf. Davila, 2010).

However, in this paper, it is not possible (or reasonable) to suggest a widely applicable process for controlling servitisation. This is partly due to the variety of interpretations of service business and servitisation. Since the service portrayed is context-specific (Edvardsson *et al.*, 2005), so is the control for servitisation (cf. Chapman, 1997; Chenhall, 2003). Moreover, during the servitisation process, the performance measurement and the control should evolve. This development may take place in terms of both the scope and the content of the control (cf. Henri, 2010) and, as the findings of this paper also suggest, the role of MA in general and in single decision-making situations should also be constantly revised. This finding is not exclusive to servitisation, but applies to any reason to change MA practises (cf. Lukka, 2007).

Indeed, the active/passive role of MA during the servitisation deserves further elaboration (Skaerback and Tryggestad, 2010). It is the task of MA to affect the culture of decision-making in the companies and vice versa (Burchell *et al.*, 1980). Typically MA literature promotes the idea of proactive support from MA for managers, instead of reactive behaviour. This does not necessarily mean an increase of MA personnel within companies, but perhaps a new way of thinking in the company that would naturally increase the awareness of the managers about the business environment (Hall, 2010), including service business opportunities. If existing MA practise does not sufficiently support this kind of cultural change, new MA practises might be explored within the servitisation process. As the case studies suggest, informal control mechanisms can be used in the exploration of the servitisation opportunities (cf. Lukka, 2007). Some of these controls (for example, customer-profitability analysis or service R&D metrics) may be institutionalised in the course of servitisation and thereby reflect the current interpretation of the business context among key personnel.

Finally, the identification of the potential roles of MA in servitisation responds to the service business potential that exists in many business environments. In practise, this would mean the identification of a set of potential roles for MA, ranging from restrictive answers and economic inquiries to analyses that serve as sources of inspiration (Burchell *et al.*, 1980). Despite the variety of the potential MA roles, the MA activities chosen should reflect the particular needs of a given business environment. In many cases, the level of service business expectations is too high and MA could help to set realistic targets to guide managerial actions. Even greater, but less tangible, potential exists in releasing the unaddressed service business potential, but this would require a large-scale rethinking in the company. These two sides of MA activities should be taken into consideration in future research on MA in servitisation.

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