

Roles of accounting and control in New Service Development within Servitization – a literature review and research implications

Teemu Laine*(1, 2) (teemu.j.laine@tut.fi), Lino Cinquini (2) (l.cinquini@sssup.it), Petri Suomala (1) (petri.suomala@tut.fi), Andrea Tenucci (2) (a.tenucci@sssup.it)

(1) Cost Management Center, Tampere University of Technology, PO Box 541, 33101 Tampere (Finland)

(2) Institute of Management, Scuola Superiore Sant'Anna, Piazza Martiri della Libertà, 24, 56127 Pisa (Italy)

* corresponding author

Abstract

Purpose: While acknowledging the importance of servitization, we are concerned about the absence in the academic literature of the management control related issues of such a transformation. With the help of the literature review on accounting and control for servitization, supported by the body of knowledge about New Product Development (NPD) accounting and control, we examine the potential of accounting and control for New Service Development (NSD) within servitization.

Methodology: The paper presents the results of a literature review and proposes an agenda for further research in this area. The review focuses on the selected nine (9) scholarly journals with a focus on servitization, accounting and control.

Findings: The literature review confirmed the existence of the research gap regarding the roles of accounting and control in NSD within servitization. In fact, only a few papers address explicitly the topic of planning and controlling the servitization. The roles of accounting and control are even less examined related to the NSD within servitization

Implications: Besides showing the research gap, the paper proposes an agenda for further research in this area. The further research should focus especially on the overall position of the NSD management in the servitizing companies, the roles of accounting and control in the NSD activities within servitization and the potentials for further developing the roles of accounting and control in this context. Given the practical relevance of the NSD for servitization, there are high expectations regarding both the scientific and practical relevance of the results of the proposed research agenda.

Originality/value: In light of the existing literature on servitization, the viewpoint of accounting and control for servitization is relatively unique, despite its importance in actually managing and succeeding in the servitization initiatives. To enhance scientific knowledge in this topic, and to derive also practical implications from it, we propose a detailed agenda for further research.

Forum topics:

- Business models to manage networks and service systems
- Service processes and engineering
- Value propositions

1. Introduction

The paper enhances the understanding about the unused potential of management control related to the servitization process (Wise and Baumgartner 1999, Mathieu 2001, Oliva and Kallenberg 2003), by focusing on the New Service Development (NSD) activities of the manufacturers within servitization (Neu and Brown 2005). More particularly, the paper examines the potential of accounting and control for supporting those activities that has not been sufficiently addressed in the extant literature.

In any strategy implementation process, there is a trade-off between fostering innovation and controlling the desired outcomes (Simons 1995). Therefore, the choice and the balanced enactment of the suitable accounting and control devices (Chenhall 2003, Malmi and Brown 2008) is a crucial challenge also for the companies under servitization (Laine et al. 2012a). The development of the new offering, as a part of the overall servitization process, constitutes yet another set of challenges for control in the servitizing companies. The point of departure in this paper is the servitizing companies' need for support in designing and managing their NSD, potentially made available by the accounting and control functions of those companies.

There is a growing body of knowledge on the preconditions and potential of accounting and control in supporting decision-making in product development context, with a significant influence on the long-term profitability of the company (Nixon 1998, Davila 2000, Davila and Wouters 2007, Jørgensen and Messner 2010). Accounting and control may play a significant role in NPD, especially in the context of an intended strategic change (Jørgensen and Messner 2009), such as servitization. At the same time, the roles of accounting and control in the servitization in general and the related NSD have not much been addressed in the existing literature (see Laine et al. 2012a about accounting in planning and controlling servitization).

We acknowledge, first, the fact that there are different approaches to the servitization strategy implementation in the companies. For instance, offering development and relationship development are identified as different approaches for servitization (Oliva and Kallenberg 2003, Penttinen and Palmer 2007). In this paper, we focus especially on the servitization founded on offering development which also highlights the importance of NSD activities. Second, it is known that servitization is of interest to companies in many industries. This paper has its focus on machinery manufacturing companies, where servitization takes places widely due to their installed base (Wise and Baumgartner 1999, Oliva and Kallenberg 2003, Gebauer et al. 2005, Holmström et al. 2010). Altogether, it remains unknown in this context and in servitization literature more broadly, to what extent the remarkable potential of accounting and control to guide the NSD within servitization has been realized in the manufacturing companies.

This paper seeks to respond to the research gap of managing NSD within servitization. Thus, we examine the potential of accounting and control for New Service Development within servitization, with the help of the literature review on accounting and control for servitization, supported by the body of knowledge about NPD accounting and control. The review focuses on the selected nine (9) scholarly journals with a focus on servitization, accounting and control. In addition to the results of the literature review, the paper proposes a detailed agenda for further research in this area.

The rest of the paper is structured in the following way. The literature review is described in Section 2.1, thus summarizing the extant knowledge about the roles of accounting and control in servitization and New Service Development (Sections 2.2-2.3). In Section 3, research

implications are derived based on the findings. More particularly, Section 3.1 provides an overview of the agenda for further research, followed by more detailed research questions, regarding the overall emphasis on the NSD management in the servitizing companies, the roles of accounting and control for NSD and the potential for developing accounting and control for NSD (3.2-3.4). Finally, the findings are put together in the conclusion section (4).

2. Literature review

2.1 Overview of the literature review

The aim of the literature review presented in this paper is to provide an overview of the existing knowledge about accounting and control for servitization and, particularly, for new service development within servitization. As conveyed in the introduction, the central articles forming the body of knowledge of servitization are surprisingly silent about the planning and control of the servitization.

The outline of the literature review, as described in this section, consist of the four following steps: 1) An overview of the existing knowledge was gained through Google Scholar searches. 2) Emerald, Science Direct and other databases were used for more systematic searches in target journals selected as the most prominent in the research areas of service and in that of accounting, such as Journal of Service Management, Journal of Service Research, Managing Service Quality, Accounting, Organizations and Society and Management Accounting Research, i.e., journals with a focus either on servitization (context) or accounting and control. Altogether nine (9) scholarly journals were iteratively chosen during the literature review. 3) Searches in the databases were supplemented with new keywords to gain access to a more extensive set of potentially relevant articles. 4) The results of the literature review were critically examined and additional searches and analyses are conducted when needed.

First, Google Scholar searches were conducted in the following way. When using the key words “Accounting” OR “Control” OR “New Service Development”, about 1660 articles were found, but these references focused primarily on the general service or accounting issues and the potential results related to the topic of this paper were fragmented and blurred. Next, the key words used in Google Scholar were “Accounting” OR “Control” OR “Servitization” OR “Servitisation”. Now, only 39 articles were found. These articles were either well-known papers in the servitization domain, already referred to in the introduction, or indeed such papers that would be helpful in the more detailed review of this article. Of course, some articles seemed also somewhat irrelevant for the purposes of this study. Finally, using the keywords “roles of accounting and control in servitization” provided 34 articles, and most of them were the same as in the previous search. Altogether, using Google Scholar preliminarily confirmed the research gap, but shed light also on a few, already existing studies in this area. Moreover, insights into the most relevant journal outlets for the more specific searches were attained.

Second, regarding the more systematic searches, the authors identified the Emerald and Science Direct databases to be suitable for this purpose. Emerald publishes many of the most influential service journals, such as Journal of Service Management, Managing Service Quality and Journal of Services Marketing, supplemented with a few relevant accounting journals. On the other hand, Science Direct is the publisher of many of the most influential management accounting journals, such as Accounting, Organizations and Society and Management Accounting Research, in

addition to some potentially relevant service-related journals. Besides the contents of these two databases, the Journal of Service Research was also included in the review as it is considered a major journal in service topics.

Moreover, it was argued that the searches might be limited to the timeframe from 1995 to present. This is due to the fact that Vandermerwe and Rada (1988) were actually the first ones to use the term "servitization", and Mathieu (2001) and Oliva and Kallenberg (2003) were among the first ones in the service journals to actually focus on the examination of the "transition from products to services". Therefore, it was assumed that the articles prior to 1995 are already "common knowledge of the servitization", already widely known among the scholars in this area and summarized from the viewpoint of this study in the introduction section.

As conveyed in Table 1, using the keywords ("accounting" OR "control" in abstracts) AND ("servitization" OR "servitisation" OR "new service development" in all fields) resulted in 9 articles in Emerald target journals, only 1 article in the Science Direct target journals and 1 article in the Journal of Service Research. A brief review of the articles reduced the number of relevant articles (5 in Emerald and 1 in Science Direct). The reason for abandoning some of the articles was the fact that the term "control" was quite often used in the abstracts in a different meaning, such as "control variable" or "quality control".

Table 1. Results of the literature searches in the databases.

Journal Main Content	Journal Title	Time span	Keywords	Articles found	Articles deemed relevant
Sum (Emerald)				10	5
Emerald search:					
Service	<i>Managing Service Quality</i>	1995-2012	"accounting" or "control" in Abstract and "new service development" or "servitization" or "servitisation" in All fields	5	1
		1995-2012	"servitization" or "servitisation" in Abstract	1 new	1
Service	<i>Journal of Service Management</i>	1995-2012	"accounting" or "control" in Abstract and "new service development" or "servitization" or "servitisation" in All fields	2	1
		1995-2012	"servitization" or "servitisation" in Abstract	0 new	0
Service	<i>Journal of Service Marketing</i>	1995-2012	"accounting" or "control" in Abstract and "new service development" or "servitization" or "servitisation" in All fields	2	2
		1995-2012	"servitization" or "servitisation" in Abstract	0 new	0
Accounting	<i>Qualitative Research in accounting and Management</i>	1995-2012	"accounting" or "control" in Abstract and "new service development" or "servitization" or "servitisation" in All fields	0	0
		1995-2012	"servitization" or "servitisation" in Abstract	0 new	0
Accounting	<i>Journal of Accounting and Organizational Change</i>	1995-2012	"accounting" or "control" in Abstract and "new service development" or "servitization" or "servitisation" in All fields	0	0
		1995-2012	"servitization" or "servitisation" in Abstract	0 new	0
Sum (Science direct)				4	3
Sciencedirect search					
Accounting	<i>Accounting, Organizations and Society</i>	1995-2012	"accounting" or "control" in Title-Abstract-Keywords and "new service development" or "servitization" or "servitisation" in All fields	1	1
		1995-2012	"servitization" or "servitisation" in Title-Abstract-Keywords	0 new	0
Accounting	<i>Management Accounting Research</i>	1995-2012	"accounting" or "control" in Title-Abstract-Keywords and "new service development" or "servitization" or "servitisation" in All fields	0	0
		1995-2012	"servitization" or "servitisation" in Title-Abstract-Keywords	0 new	0
Marketing, incl. service?	<i>Industrial Marketing Management</i>	1995-2012	"accounting" or "control" in Title-Abstract-Keywords and "new service development" or "servitization" or "servitisation" in All fields	0	0
		1995-2012	"servitization" or "servitisation" in Title-Abstract-Keywords	3 new	2
Sum (Other databases)				1	0
Other Databases					
Service	<i>Journal of Service Research</i>	1998-2012	"accounting" or "control" in Abstract and "new service development" or "servitization" or "servitisation" in All fields	1	0
			"servitization" or "servitisation" in Abstract	0	0

Third, due to the small number of relevant articles, the authors decided to supplement the searches with key words that would capture the body of knowledge regarding servitization, without explicit discussions about accounting and control in the abstracts of the articles. As a

result, using (“servitisation” OR “servitization” in abstract) as the keywords, 1 additional article was found in Emerald target journals and 3 additional articles were found in the Science Direct target journals. The number of relevant articles increased with 1 and 2 articles respectively. Altogether, as a result of the literature review, 8 selected, somewhat relevant articles were found from the target journals. It is noteworthy that only 2 of those articles were published earlier than 2010 and none of the earlier than 2005, thus showing the timeliness of the topic.

Fourth, as a critical examination of the review results, the findings based on the found articles are summarized in this section regarding the roles of accounting and control in servitization in general and regarding the roles of accounting and control in new service development in particular. Altogether, these findings form the basis for an agenda for further research, presented in Section 3.

2.2 Roles of accounting and control in servitization

Based on our survey, there are actually not many articles published that have a focus on the accounting or control in the servitization. In fact, the paper by Laine et al. (2012a) was the only one in the review with the explicit aim to examine the potential roles of management accounting in supporting servitization. It is noteworthy that this paper was published in a service journal, not in an accounting outlet. In fact, service and servitization issues do not seem to play a major role in the accounting literature. However, at the same time, there are several streams in the accounting literature that could potentially help in finding support for servitization at the manufacturers.

Based on their conceptual analysis supplemented with empirical examples, Laine et al. (2012a) suggested that the role of management accounting in servitization may be divided into justifying, defining and controlling the servitization. Moreover, it was argued that accounting could support servitization at three levels, which are the company level, the product/relationship level and the process level. The management accounting information could serve in different roles at those levels, ranging from an answer machine to a source for inspiration (see Burchell et al. 1980, as used in Laine et al. 2012a). Based on the distinction between company level and product level support (Laine et al. 2012a) for servitization, the reviewed articles can be divided into articles dealing with the overall (company-level) support for the servitization and articles dealing with supporting new service development (product-level) within servitization. At both levels, however, the existing body of knowledge is fragmented and thus suggested to be supplemented with further research.

Regarding the overall support for servitization by accounting and control, the study by Naranjo-Gil and Hartmann (2007) is the sole example within the accounting literature dealing with strategic changes towards new service businesses. According to Naranjo-Gil and Hartmann (2007), the combination of heterogeneous top management teams, interactive use of accounting information and a broad scope of information provided by management accounting system support the strategic change towards a new kind of position in the market. These characteristics are argued to be more influential, if the company aims at a prospector strategy, in contrast to a defender one. The value of the study by Naranjo-gil and Hartmann (2007), from the viewpoint of this paper, lies in its overall support for the idea that the different roles and different types of using management accounting systems should be actually helpful at different phases of the servitization initiatives. This is also in line with the overall message conveyed by Laine et al. (2012a).

In the service literature, only a few papers were found that discuss the overall potential for service business in different manufacturing and industrial service settings. This stream seems to follow the path initiated by Wise and Baumgartner (1999) in their Harvard Business Review article, which discussed the downstream business potential as a 'new profit imperative' for manufacturing. They discussed the different circumstances, under which different downstream potentials would exist and thus different servitization strategies should be followed respectively. In this vein, Hu and McLoughlin (2012), build their multiple case study report on the strategic management literature and propose a holistic framework for the companies seeking for new markets to their industrial services. They conclude that at least cooperation with the customers, different forms of innovations and support from the institutional forces, such as legislation support the companies in creating new markets for their services. However, instead of dealing with the roles of accounting and control in such a process of market creation, Hu and McLoughlin (2012) just discuss the 'control' of the companies over the new markets. However, the lesson learned from Hu and McLoughlin (2012) from the viewpoint of this paper is the fact that the companies should be aware of the business potentials under different circumstances in their customers' businesses. Accounting and control could help in creating such awareness.

Raddats and Easingwood (2010) examine the different growth options for the servitization from a product-centric business status. They propose a framework of different growth options, based on the distinction between product-centric and customer-centric offerings and the distinction between servitizing companies' own products and those supplemented with third party products. Depending on the strategy, the companies could either grow by adding third party services to their offering or by first developing the offering to be more customer centric and only after that adding third party services to the offering. The identification of the different phases and paths in servitization is somewhat analogous to the earlier studies by Oliva and Kallenberg (2003) and Penttinen and Palmer (2007). Unfortunately, similarly to these earlier studies, also the study by Raddats and Easingwood (2010) is silent about the roles and means of controlling or supporting the different phases of the transition between different phases of servitization.

The study by Laine et al. (2012b) provides one potential solution for justifying or defining the servitization initiative, without (again) explicit discussion regarding the roles of accounting and control in the later phases of servitization. Laine et al. (2012b) analyse the use of a business game concept on the customers' business at a servitizing company to enhance learning from the customers' business in the company. They argue that the business game concept is to provide a sound basis for identifying the service business potential based on the current status of the manufacturers business and the increased awareness of the drivers of profitability at the customer. In other words, the reports derived from a business game on the customers' business may help in identifying the factors affecting new market creation for industrial services, as proposed by Hu and McLoughlin (2012). Internal and external cooperation with the help of the business game concept could lead into different types of innovations in terms of realizing the manufacturing company's service business potential.

Altogether, building on the study by Laine et al. (2012a) it may be argued that the servitization literature primarily examines the justification or definition of the servitization initiatives, without yet actually discussing the controls or the purposes of use given to accounting information in later phases of servitization. For the purpose of this study, some new ideas could be found in the accounting literature to supplement the existing knowledge about the roles of accounting and control in servitization. Even more detailed analyses are required, however, for understanding the roles of accounting and control in NSD within servitization.

2.3 Roles of accounting and control in new service development

By presenting a hierarchy of different accounting objects Laine et al. (2012a) propose that besides company level considerations, management accounting could support in developing new services (or products) within servitization. Building on a few studies on accounting in New Product Development (NPD) (see e.g., Nixon 1998, Jørgensen and Messner 2010), they state that as the uncertainties related to the new services reduce, accounting may help in sharpening the image of profitability of the new products. As a result, similarly to managing the NPD project portfolio with the help of the accounting and control, the NSD projects at different phases could benefit from the appropriate use of controls and accounting information. However, besides the few case examples referred to by Laine et al. (2012a), no empirical evidence has been reported on the actual roles of accounting and control for NSD within servitization.

The review of the existing studies related to NSD did not shed that much light on the potential roles of accounting and control in NSD. In fact, only few studies provide explicit discussion on the issues of accounting and control in the NSD. There is, of course, a literature stream on the NSD process models, which could be considered as the literature stream on the overall control for NSD activities (see e.g., Johne and Storey 1998 for a literature review on NSD). In fact, the NSD models have been typically adopted from NPD and their applicability to NSD management has been under a debate during the past two decades (Alam and Perry 2002). However, the special requirements for accounting and control are not much discussed, but, for instance, an emphasis is placed on the early customer involvement in NSD (Johne and Storey 1998) and the need for metrics regarding the value creation at the customer is highlighted (Grönroos and Helle 2010).

Shulver (2005) examines the limitations of the conventional NSD process models in supporting effective new service development. Shulver (2005) argues that operational losses (both internally and externally) provide one basis for successful NSD. However, as argued by Shulver (2005), it is not self-evident that the existing NSD management models could capture the extent or the nature of the current losses as the basis for NSD, but they more readily offer a 'blue sky' approach to NSD. In Shulver (2005), it is proposed that the NSD projects should be chosen and managed based on a detailed awareness of the limitations and unwanted losses in the existing processes. Although Shulver (2005) does not explicitly discuss the roles of accounting in NSD, one potential role for accounting could be in translating the different types of 'losses' into monetary terms to identify the business potential underlying the new services. Moreover, during the NSD projects, the image of the business potential could be presented, for instance, in terms of responding to the initially identified losses as the rationale for the project. Analogously to Nixon (1998, on NPD), Shulver (2005) acknowledges the fact that as the NSD projects proceed, the image of the business opportunity becomes clearer and the provision of the economic figures related to the business opportunity will change accordingly.

The study by Palmer (2010) has its focus on managing and controlling customer experience. Despite its limited explicit contribution to the topic of this paper, Palmer's study represents a reminder about the fact that the customer experience remains a phenomenon that is difficult to estimate and manage. Although the service business potential in general would be based on the economic facts of the customer's business (Laine et al. 2012b), and the 'losses' in the current business would be directed the NSD project management in monetary terms (Shulver 2005), the customer experience could not be comprehensive managed beforehand (Palmer 2010). The customer value of the new service is a multifaceted phenomenon that can only partially be captured by accounting information (Laine et al. 2012a).

Yet another practical limitation to the NSD management is provided in the recent study by Spring and Araujo (2013), who argue that the supplier network of the manufacturers may not be ready for ensuring the sufficient delivery of the new services under development. Therefore, besides reviewing the internal resources and activities, the manufacturers should review the ability of their suppliers to provide the new services under development. As described by Möller (2010) and Laine et al. (2012a), the new services should be understood in terms of their underlying resources, activities and desired outputs/outcomes. As a result, the development of the new services may yield changes in the processes as a whole or in different elements within the processes (see also Gallouj and Weinstein 1997). Therefore, the NSD process may include the examination of the processes across company boundaries, namely at the suppliers, at the manufacturer and at the customers.

Altogether, not much is yet known about the accounting and control for NSD in servitization, despite the extent of the NSD literature and related discussions. Both at the company and product level, we argue that the roles of accounting and control are so far discussed (if at all) in the context of identifying or defining the business potential of a given new service. As a consequence, there is still room for studies for opening the ‘black-box’ of NSD from the viewpoint of accounting and control.

3. Implications of the review

3.1 Synthesis of the research gaps

As a general observation, the need for planning and controlling the servitization has been brought up in the servitization literature already at its early phase (Vandermerwe and Rada 1988, Wise and Baumgartner 1999) and it has been called for again and further elaborated more recently (Penttinen and Palmer 2007, Raddats and Easingwood 2010, Laine et al. 2012a). However, despite providing the overall need for supporting the strategic changes with accounting (Naranjo-Gil and Hartmann 2007), no broad empirical studies exist on the actual roles of accounting and control in supporting the servitization. The practice of controlling the NSD within servitization is not reported in a detailed manner either, although there are sources that discuss the need for such activities at a more general level (Shulver 2005, Laine et al. 2012b, Spring and Araujo 2013).

In this section, an agenda for a research inquiry is proposed regarding the roles of accounting and control in NSD within servitization. The agenda is, firstly, based on the finding that the corporate strategy influences the use of accounting for the strategic purposes (Cinquini and Tenucci 2010). As a result, the actual content of the servitization strategy and the position of the NSD activities in such a strategy should be carefully examined as a basis for more detailed findings regarding accounting and control for NSD. Secondly, the existing knowledge on accounting and control for NPD (see e.g., Nixon 1998, Davila and Wouters 2007, Jørgensen and Messner 2010) should be translated into the servitization context to draw conclusions at a more detailed level. The agenda is divided into three parts in the following way:

- What is the overall position of the NSD management in the servitization strategies of the companies?
- What kinds of roles do accounting and control take in the NSD activities within servitization?

- What kinds of potentials do exist for further developing the roles of accounting and control in this context?

The three parts of the research agenda are discussed in a more detailed manner in the following subsections (3.2-3.4). In these sections, besides the articles reviewed, also additional sources e.g., in the domain of NPD accounting/control are used to create a more comprehensive research agenda and to provide potentially relevant insights into the more specific context of NSD within servitization. At the general level, the research is supposed to answer to the need for understanding the existence and the content of accounting and control in NSD activities. Moreover, it is also proposed to examine whether the companies feel that accounting and control, as it is currently being undertaken in the companies, actually works as it should work or whether it should be further emphasized and/or refined.

3.2 Positioning the NSD management in the servitizing companies

A prerequisite for understanding the current (or ‘best’) practice of the accounting and control for NSD is the awareness of the overall emphasis on the NSD activities in the servitizing companies. These positioning could be addressed with questions, such as:

- How are the NSD activities organized within the R&D of the companies?
- How many people are dedicated to NSD activities in the company (from X people in total in R&D)?

The positioning of the NSD activities becomes even more important, yet interesting given the concern by Laine et al. (2012a), who questioned, whether the NSD projects of the manufacturers are actually accepted into the official offering development portfolio of the companies– in contrast to the NPD projects of those companies. If not, accounting and control for those projects is more or less informal and even more challenging. Moreover, the business impacts of the new services are embedded to the overall business of the manufacturers, which challenges the provision and enactment of accounting information in this context (cf. Malleret 2006, Laine et al. 2012a). Therefore, there might be a practical knowledge gap between the very complicated accounting context of NSD and the immature practice of controlling or supporting it with accounting information.

As a result, we suggest that the following questions should be helpful in shedding light on the maturity of the NSD within servitization and in more detailed positioning of NSD from the accounting and control viewpoint:

- How many (‘official’) projects are there in the portfolio (NSD/NPD)?
- Are the process phases the same for both NPD and NSD?
- Are the projects managed systematically?
- What is the priority of the NSD projects in comparison with NPD projects?
- What is the success rate of the NSD projects in comparison with NPD projects?

Altogether, based on the findings regarding the scope and the management model for NSD activities, the findings regarding the roles of accounting and control in this context become more understandable and hold potentially more scientific value. Moreover, the overall priority of the servitization activities and the adoption of related management controls could deserve further examination, in connection with the proposed process phases of the servitization processes, for instance (Oliva and Kallenberg 2003, Neu Brown 2005).

3.3 Roles of accounting and control for NSD

First, regarding the roles of control in the NSD projects, there is a need to outline the general understanding about the management control systems (MCSs) of the companies. The MCSs are there in the companies to ensure/support the desired behavior of the managers (Chenhall 2003). The controls may be seen in different ways, e.g., either as coercive rules for manager compliance or as enabling mechanisms for supporting employee's motivation and performance (Adler and Borys 1996, Ahrens and Chapman 2004). Simons (1994, 1995) divides the use of controls into boundary controls, diagnostic controls, interactively used controls and overall beliefs systems of the companies. More recently, MCSs have been seen as a package (Malmi and Brown 2008) that consists of cultural controls, administrative controls, planning devices, cybernetic controls (performance measurement) and reward and compensation. Different organizations employ different packages and different controls within the packages are used in different ways.

From the viewpoint of this paper, the controls in use for NSD activities and also the actual way of using them is an essential theme. In other words, we seek to find out answers to the following questions:

- What kinds of controls are used in the NSD projects (as elements of the control package)?
- What are the key roles of control in the NSD projects (cf., Simons 1994 for use of controls)?
- What is the clarity of controls (vague or clear)?

We propose that the research should examine the controls in NSD as such, but also in contrast to the NPD controls. As known already, the adoption and use of NPD portfolio models and project models is discussed widely in the accounting literature (see e.g., Davila 2000, Davila et al. 2009). Roughly speaking, the scope of the NPD control may be divided into NPD project selection and project execution, with a set of context specific flavors (Davila and Wouters 2007). One may assume that the controls are adopted already for the NPD activities and, based on the presented review there might be lessons that can be learned from that adoption. Moreover, the maturity of the NSD usage of those controls in contrast of using the in the same company for NPD activities could also be examined. Regarding the roles of the controls, besides the uses of controls outlined by Simons (1994) one could also think about the uses of the controls for managing market uncertainties and simply for coordinating resources involved. These could be valuable viewpoints also in the NSD context.

Second, regarding the accounting for (supporting) NSD activities, the chosen strategy was shown to influence to a certain extent the strategic use of accounting at the company level (Cinquini and Tenucci 2010). At the moment, the existing literature does not provide too many details regarding the accounting for servitization, at the level of the NSD projects. Thus, we propose that this research gap could be addressed with the help of the following questions:

- What kinds of accounting tools are used in projects?
- What are the key roles of accounting in the projects?
- How systematically is accounting info provided?

At a general level, NPD projects, and NSD respectively, could be supported by *ex ante* and *ex post* accounting information (cf. Davila and Wouters 2007 on NPD accounting). For instance, an

estimate of the business impacts of a new service could include the understanding about the service volumes, prices, costs and indirect effects to other products and services. The image of the business impacts sharpen gradually, as first pilots/prototypes come to existence and it will sharpen even further as the service is launched into the markets. Regarding the NSD costs, there is the budget for the project in advance and the incurred costs are typically steered according to the budget. During the servitization, however, the traditional accounting objects of the companies may be challenged and refined. For instance, the shift in the object of cost analyses towards ‘the output to the user’ can support decisions on NSD that aims at reducing the utilization costs for the customer. Here, wider cost analyses such as Total Cost of Ownership (TCO) enable understanding the burden beyond pure transaction price, and evaluating efficiency from the perspective of value co-creation (Ellram and Siferd 1998, Barontini et al., 2013).

It is noteworthy that accounting may serve NSD management in different roles. In all, there are different types of decision-making situations that would benefit from different accounting roles (Burchell et al., 1980; Chapman, 1997). Firstly, when there is low uncertainty over both the consequences and the objectives of the action, accounting 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). However, as NSD activities include significant uncertainties, there is even more potential for other roles of accounting. For instance, if the consequences of an action with a certain objective are relatively uncertain, accounting could play the role of a “learning machine.” In other words, an understanding of the actual consequences is gained during the process of NSD, with the gradually sharpening idea of the business impacts of the service at hand. Thirdly, in any organization there are competing aims and objectives for development and accounting can be used to translate these viewpoints into economic 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 accounting could be to work as an “ammunition machine,” for example, by simulating the consequences of a new service from different viewpoints. These analyses may serve the purpose of finding the most suitable revenue model for the company. Is it better, for instance, to make money with the machinery sales and the spare part and after sales revenues, or with a comprehensive product that includes machinery and related after sales? These kinds of scenarios are important for setting clear objectives for particular NSD projects. Finally, regarding the roles of accounting in NSD, it should also be questioned, whether accounting information is provided only occasionally or whether there are systematic practice for accounting information provision.

3.4 Potential for developing accounting and control for NSD

The third part of the agenda for further research would include the assessment of the current ability of the accounting and control to actually support NSD within servitization. This topic could be addressed by two generic questions:

- How well do accounting and control succeed in (different aspects of NSD management)?
- How much has accounting and control changed recently (within a year)?

Besides the perceived successful of accounting and control in its different purposes of use, one may be interested in the evolution and the recent changes in the company practices in this area. In other words, if there are disappointments regarding the roles of accounting and control, it might be interesting to know, whether the companies have already taken actions for fulfilling the identified gaps.

Regarding the performance of accounting and control, one may ask the performance in light of the aims of the servitization in general or in light of the NSD objectives in particular. Moreover, there is the possibility of examining more detailed level expectations regarding the accounting and control for NSD. One should note that the answers to these questions as well as some other questions may be dependent on the position, held by the respondent of a survey or an interview. We proposed that besides service managers and financial managers, also R&D managers or even general managers could provide insights into the topics outlined in this agenda for further research.

4. Conclusion

While acknowledging the importance of servitization, we are concerned about the absence in the academic literature of the management control related issues of such a transformation. With the help of the literature review on accounting and control for servitization, supported by the body of knowledge about NPD accounting and control, we examined the potential of accounting and control for New Service Development within servitization.

The literature review confirmed the existence of the research gap related to the use of accounting and management control within servitization processes. Quite strikingly, only a few papers deal with planning and controlling issues in the context of servitization. The roles of accounting and control are even less examined in the NSD within servitization (except for brief examinations in Laine et al. 2012a, Barontini et al., 2013)

Besides showing the research gap, the paper proposed an agenda for further research on accounting for servitization and outlined a set of questions that are useful in gaining more in-depth information on the subject. The further research should focus especially on the overall position of the NSD management in the servitizing companies, the roles of accounting and control in the NSD activities within servitization and the potentials for further developing the roles of accounting and control in this context. Given the practical relevance of the NSD for servitization, there are high expectations regarding both the scientific and practical relevance of the results of the proposed research agenda.

Finally, the outlined potential of accounting and control in NSD within servitization stresses the importance of supporting the NSD activities at different phases with relevant accounting information. At the same time, anecdotal evidence was found that the potential might not (at all) been realized in the companies. To further research on this stream, a survey will be conducted by the authors in 2013 regarding the accounting and control in NSD among manufacturers in Finland and in Italy.

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