NEW SERVICE DEVELOPMENT: SUCCESS FACTORS FROM THE VIEWPOINT OF FLEET ASSET MANAGEMENT OF INDUSTRIAL SERVICE PROVIDERS

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Abstract
Numerous studies in the last two decades have revealed that many factors of success and failure in new service development (NSD) do not significantly differ from the influencing factors in new product development in the manufacturing environment. However, typical service characteristics, e.g. intangibility, heterogeneity, inseparability and perishability have a significant influence on the emphasis of the factors in NSD.

Several authors have also recently stressed that the traditional boundaries between manufacturing firms and services are becoming obsolete. Many traditional manufacturing companies have increased their maintenance and other services for the whole lifecycles of their products, while service firms tend to compete with tangible products like “productized” software as well.

The study focuses on the industrial environment of machinery suppliers who aim to increase the volume of the service business and its share from the total turnover. It is hypothesized that the management of fleet assets (for instance information and knowledge management related to a wide globally installed machinery base) is a key factor and precondition for successful development of the new service concept, which together with “generic” success factors lead to the better competitive advantage.

The study is a part of a larger multi-disciplinary research project started in 2007. In this paper we bring forth a framework for successful NSD and transformation towards more service-oriented business in the networked environment, and we also study the influence and relations of success factors on effective asset management. In addition, we make a preliminary analysis between the success factors of NSD in the literature and the real challenges faced by the five interviewed Finnish manufacturing firms in the areas of fleet asset management and NSD. Since the value of service is co-created in interaction between the provider and the customer, interviews of selected client firms of machinery suppliers also bring essential information for complementing the picture. In the empirical research, the aim is not only to understand the value creation process but also to understand how to make the value of the service more apparent to customers.

Keywords: industrial services, fleet asset management, new service development, success factors.

1. Introduction
Studies in the last two decades have revealed that even though many factors of success and failure in new service development (NSD) do not significantly differ from the influencing factors in new product development in the manufacturing environment [1-3], the typical service characteristics, e.g. intangibility, heterogeneity, inseparability and perishability (IHIP) [e.g. 4, 5] may have a significant influence on the emphasis of the factors in NSD. Many authors have also recently stressed that the traditional boundaries between manufacturing and services are becoming obsolete [6, 7]. Authors have noted that there are new forms of production for supplying physical products together with intangible services [6]. In the business life, traditional manufacturing companies have increased their maintenance and other services for the whole lifecycles of their products, while service firms tend to compete with tangible products like “productized” software as well [8].
The “general” success factors influencing the new product and service development may include, for instance, the strategic focus on innovation [9, 10], appropriate resource commitment [11, 12], management support [13], and formal new service development process [14-16]. On the other hand, service characteristics may require different emphasis of factors and capabilities influencing the success in the development of new services. Therefore, new approaches for promoting the management and development of industrial services are needed. Also, factors like highly trained experts in the company [17, 18], the learning environment in the company [19-21], and especially customer involvement in the development process [13, 21, 22], may be more important in service development when compared to new product development.

As stated above, there are some differences in service firms and manufacturing firms in the development of products and services. In addition, there are differences inside the service sector between different types of services as well. The services discussed in this paper are typically industrial services, e.g. maintenance and development services supporting the efficient use and the whole life-cycle of industrial assets. These types of services and factors affecting the success in a context like this have not yet been widely studied when considering the increased potential of services related to the industrial environment and physical assets. This study focuses on the industrial environment of machinery suppliers who aim to increase the volume of the service business and its share from the total turnover. It is hypothesized in the present study that the management of fleet assets (for instance information and knowledge management related to the wide globally installed machinery base) is a key factor and precondition for successful new service concept development, which together with “generic” success factors lead to the better competitive advantage.

The main aim in this paper is to bring forth a framework for successful NSD and transformation of the business towards a more service-oriented business in the networked environment. We will also study the influence and relations of success factors on the effective management of industrial assets and the development of new services. In addition, we will make a preliminary analysis between NSD success factors presented in the literature and the real challenges faced by five interviewed Finnish manufacturing firms in the areas of fleet asset management and NSD.

This study comprises four main parts. The first part, introduction, presents the background, objectives and focus areas of the study. In the literature review we summarize the wide literature on success factors in new service development, especially from the view point of industrial services. The third part includes the description of an empirical research where we present the main challenges and revealed success factors in the new service development and in the transformation of business towards services in general, on the basis of qualitative expert interviews and workshops in which several industrial firms participated. In the discussion part we analyze the results of the empirical research together with the literature viewpoints, using the new service development process approach as the background framework. On the basis of the synthesis we present the theoretical and managerial implications of the research results. The final conclusions also include suggestions for future research.

2. Literature Review on Success Factors in New Service Development in an Industrial Environment
This chapter aims to shed light on the different factors influencing success in the new service development. Our specific focus is on the new industrial services that are produced by (or in close collaboration with) manufacturing firms, e.g. machinery equipment suppliers.
According to Grönroos [23], services are activities or series of activities of a more or less intangible nature that normally, but not necessarily, take place in the interaction between the customer and service employee and/or physical resources and/or systems of the service provider, which are provided as solutions for customer problems. There are various definitions of services, in several of which the keywords are activities, deeds or processes and performance [4, 24, 25]. Grönroos’ definition [23] includes three major elements: 1) activities, 2) interaction and 3) solutions to customer problems. Grönroos [23] identifies two different aspects in categorizing services, the type of service and the type of customer. A service is either a professional service or another type of service, and it can be offered to either customers or organizational buyers.

In the last decades, a remarkable number of researchers have attempted to identify factors that are crucial for the success of innovative services. The success factors can be divided, for example into internal and external success factors. Internal success factors are associated with the strengths and weaknesses of the firm, including e.g. innovation competence and the organization or design of the firm’s new service development (NSD) process [15, 26]. External success factors, in turn, can be found in the way the benefits of the new services address the opportunities and threats in the market environment. These include e.g. the fit between the customer needs and the benefits of the service offer, and the fit between the new service and the existing product portfolio. A number of studies have also focused on the contribution of supporting functions in the innovating organization, such as marketing, sales and distribution [26-28]. So far, a majority of the studies have focused on the identification of external factors [9].

Regarding the external factors, as well as some of the internal factors, there are also studies presenting the factors that act as drivers of service innovations. For instance, Kuusisto and Meyer [29] present drivers and barriers of service innovation based on Finnish and international expert views. According to their study, the phenomena acting as drivers of service innovation are: information and communication technology, complex technologies (complexity creates a need for support services), systematic development of new types of services, regulatory changes and competition (evolving markets create space for new services and business models as value-chains are being re-configured), and industry champions.

On the other hand, barriers to service innovations are [29]: rigid structures, lack of intensive competition, over-capacity, dot.com boom-bust cycle, demographics, lack of R&D funding and systematic service concept development, unbalanced business process development, lack of specialized development facilities, context-specific services and intangibility of services, availability of skilled staff, increased formality in purchasing practices, and diffusion of service innovations between firms.

Regarding internal success factors, evidence has been found that the amount and quality of conducted market research, the development speed, technological advantage and synergy between the new service and the organization contribute to the success of financial service innovations [30]. Furthermore, in a research stream focusing on the relationship between innovation performance and organization design, evidence has been found that an appropriate organization structure and decision architecture [31, 32], as well as an appropriate design of the innovation process [30, 33] may contribute to the success substantially. The importance of internal issues to the NSD process have been confirmed in recent studies focusing on the critical role of communication and information processes in the success of NSD projects [34,
Rapid technological change and turbulence in the market place increase the importance of internal success factors, since they create a more sustainable competitive advantage. De Brentani has studied new business-to-business service projects in a large-scale survey of experts in order to gain insights into the influence of product innovativeness on factors linked to the success and failure of a new service. The research results indicate that there are so-called “global” success factors which appear to govern the outcome of new service ventures, regardless of their degree of newness. These include ensuring an excellent customer/need fit, involving expert front-line personnel in creating the new service and helping customers appreciate its distinctiveness and benefits, and implementing a formal and planned launch program for the new service offering.

On the other hand, as regards new services, De Brentani makes a distinction between “low-innovativeness” and “new-to-the-world” business services. For low-innovativeness new business services, the results suggest that managers can enhance the performance by leveraging the firm’s unique competencies, experiences and reputation through the introduction of new services that have a strong corporate fit, installing a formal “stage-gate” new service development system, particularly at the front-end and during the design stage of the development process, and ensuring that efforts to differentiate services from competitive or past offerings do not lead to high cost or unnecessarily complex service offerings. For new-to-the-world business services, the primary distinguishing feature impacting performance is the corporate culture of the firm: one that encourages entrepreneurship and creativity, and that actively involves senior managers in the role of a visionary and mentor for the new service development. In addition, good market potential and marketing tactics that offset the intangibility of “really new” service concepts appear to have a positive performance effect.

The client focus is a significant element in the service development process. Kumar, for example, has empirically examined the impact of long-term client relationships on the performance of business service firms, and suggests that in the long run, relationship-oriented business service firms achieve higher returns on their investment than transaction-oriented firms. Moreover, recent research has suggested that in service environments a client-firm interaction occurs that can create higher levels of uncertainty for the firm. Thus, service organizations must adapt elements of their production process to address this uncertainty. The study of Skaggs and Youndt extends this idea by suggesting that the strategic positioning of service production determines the level of uncertainty arising from the client-firm interaction, and hence the human capital required to handle this uncertainty. Additionally, their study gives partial support for performance differences among service firms as a result of the fit between strategic positioning and human capital.

The existing literature has also tried to explain the new service development (NSD) as a process. De Jong et al. have also studied NSD as a process that can be managed. The process is for most parts close to those presented in the new product development (NPD) literature, but it is divided it into two main stages, searching and implementation, both including several activities (see Figure 1). The process, together with direct and indirect success factors, provides preconditions for service innovations including several dimensions and innovative performance.
In the case of industrial value-adding services, we also need to take the physical asset element into consideration. Management of the fleet is crucial for developing and selling maintenance and other services in the global business environment. Hence, the success of new industrial services can be hypothesized to be strongly dependent on the management of information and knowledge, which are related to the common success factors of developing new services, as well as to physical asset management.

To summarize the success factors related to new service development that can be found in the literature, the influencing factors can be grouped in many different ways e.g. to internal and external success factors. On the other hand, the barriers or risks related to new service development can be categorized similarly and in many cases they can be seen as the “other side of the coin” to the success factors. Examples of the categorization of success factors can be:

- strategic factors (clearly-defined directions, resource allocation, staffing etc.)
- organizational factors (cultural issues, inspiring environment etc.)
- structural/process factors (formal processes etc)
- technological factors (efficient use of ICT, technical competences etc.)
- market factors (changes in the market / in competition, regulations etc.)
- network-related factors (depth of relationship, level of communication, trust and communication between partners etc.)

Even though the current literature also stresses the similarity in many success factors of product development and service development, it can also be noted that there are some specific factors stressed in the service environment due to service characteristics. For example, the organizational types of success factors seem to dominate more in the case of services, especially radical ones. In the next chapter we will analyze empirically the significance of some success factors in the context of industrial services in Finnish companies, and also compare them to the viewpoints found in the literature.

3. **Empirical Research on Finnish Industrial Service Providers**

This chapter is mainly based on qualitative expert interviews and workshops carried out in cooperation with several industrial firms. This study is a part of a larger multi-disciplinary research project started in 2007. In the first round of company interviews, totally 11 experts in five industrial companies were interviewed. The interviews included questions related to success factors and challenges in the industrial service business. Additionally, all the five studied companies participated in a workshop in which the main issues posed by the interviews were discussed further and in which their significance was assessed by the participants. The results of the interviews and the workshop were analyzed by the researchers and compared to the literature review results.
The studied companies are machinery suppliers and industrial service providers (except for one that is a client firm of service providers). The service providers aim to increase the volume of the service business and its share from the total turnover. Typically, a major part of the turnover originates from industrial equipment and machinery. The aim of the service providers is also to develop new, more advanced type of services based on performance-based agreements and partnerships, in addition to traditional spare part and maintenance services. Figure 2 outlines the transition process where a machine supplier evolves into a value partner. This new situation for companies poses new types of fundamental challenges, like how to organize knowledge management, how to ensure the adequacy of skilful employees, how to organize the new service development process, how to handle networks and contracts, how to understand the manufacturing processes and the technologies used in the client organisation, and how to adapt to changes in the customer organisation. All the companies also operate in the global environment and their machinery base is geographically distributed all over the world, which may multiply the effect of some of these challenges.

Figure 2. Vision: transition from a machine supplier to an industrial service provider.

Figure 3 below depicts different viewpoints that need to be taken into account in industrial services (e.g. maintenance) in general when aiming to move from more conventional contracts to performance-based agreements as suggested by Kumar, Markeset and Kumar [42].
In Figure 3, SDS refers to the service delivery strategy and SRS to the service reception strategy. In the framework, the factors and attributes are ranked according to their level of influence on the service strategy. According to Kumar et al. [42], their framework has been validated in the Oil and Gas Industry, but can be used for other industries as well. The framework reveals the complexity of developing a performance-based service strategy, including critical success factors, “performance killers” and different cost drivers of service strategy [42]. It is essential for firms to recognize and assess the emphasis of the factors in their specific industrial environment for an effective planning, implementation and execution of the service business strategy.

Based on the first expert interviews in our studied firms, the focal themes in the influencing factors of successful service business were recognised. Examples of the themes are listed below:

a) Customer demands for maintenance services concerning machines provided by other manufacturers
b) Adequacy of skilful employees
c) Adaptation to technological changes
d) Safety management and corporate security management at the global level
e) Potential for leasing services in the future
f) Contract management
g) Harmonisation of acquisitions practices and processes
h) Networking ability
i) Internal flow of information in the NSD process
j) Development of operating services in the client’s core business area
k) Understanding of the manufacturing processes and the technologies used in the client organisation
l) Study of customer demands
m) Rapid response to changes in customer demands
n) Information and knowledge management related to the wide globally installed machinery base
o) Management of worldwide sales and maintenance network
p) Standardisation
q) Attainment and maintenance of the client’s trust
These themes were discussed in more detail among the company experts in the workshop meeting. The experts of five companies who participated in the workshop evaluated that themes a-e in the above list are the ones that are most relevant for success in the industrial service business. On the other hand, these factors are inter-related, and the most relevant factors are dependent on the other factors as well. The workshop discussion was also analysed by identifying and coding categories from the content of the discussion. Based on the preliminary categorization, some important elements that need to be studied more carefully were found:

- Trust (connection between the provider’s openness and the client’s trust)
- Pricing (connection between the provider’s openness and the transparency of pricing)
- Service offering (connection between service / product bundling and pricing)
- Information management (connection between new service development and information management related to the installed machinery base)
- Mixed cultures (balance between service oriented and product manufacture oriented organisational culture; connection between the provider’s cultural image and the client’s trust)
- Intermediate operator (ability to connect product and services from separate providers; connection between the provider’s networking ability, the client’s freedom of choice and the client’s trust)
- Knowledge management (connection between worldwide access to exploit the provider’s intellectual property and the client’s trust)

The prioritized main themes reflect the significance of both internal and external factors of success. As discussed in the earlier literature, several organizational factors seem to dominate in this case as well. For efficient management of the challenges in this type of industrial environment, the information and knowledge management practices seem to play a major role, as was hypothesized. The companies generally have a good access to the information related to the globally installed machinery base (“the fleet”). This is important for the competitive edge of their maintenance and spare part services. In the case of higher-end value solutions and partnerships, the situation is more complex, especially if the client would require services for the installed machinery base delivered by other firms as well. In this case the critical problems are related to the following main questions:

- How to build the organization to promote the products and services and their development?
- What is the role of the intermediate operator in this case?
- How to effectively manage the information and knowledge related to the life cycles of machines?
- How to develop the service offering to be as lucrative as possible and easy to purchase by the client? How to determine the pricing in the service offering?

To overcome these challenges and develop new services in this type of a situation on the basis of new client requirements, there are some success factors which we can propose to be crucial. These are e.g. deep understanding of the clients’ production and business processes, an ability to react quickly to changing client requirements, networking ability and openness of the service provider as well as trust between the value partners in the background. In addition to these “soft” factors we can assume that technological development in e.g. diagnostics and decision support systems will promote the information and knowledge management related to the new services. Moreover, the ability to make good contracts (“contract competencies”) is crucial for coping with the new organization as well as the service offering.
4. Discussion and Conclusions

Traditional success factor studies can only partly explain the factors influencing the new service development in the studied context, i.e. the transition of industrial companies from machine suppliers to high-value-added service providers.

The literature review reveals a multi-dimensionality of success factors in new service development and the characteristics (e.g. IHIP) of the service that have an influence on the management of NSD process. The “synthesis approach” also suggests that a service innovation brings forth so far neglected elements of innovation that are relevant for both the manufacturing and the services [e.g. 7]. This approach is increasing its significance when the dichotomies and boundaries between manufacturing and services are becoming blurred.

Figure 4 summarizes and integrates the viewpoints from the literature review and the empirical research in Finnish industrial companies. As a background framework we can study new service development as a simplified process, as suggested by de Jong et al. [5]. Another framework from the practical point of view is the transition process from a machinery supplier to a successful industrial service provider. The NSD process can be seen as a part of the transition. In the process, there are numerous success factors to consider in different phases. So far, our research has revealed some factors assessed high by industrial firms. The next step is to clarify more thoroughly the methods and tools that are of help in taking these influencing factors into account better, and in developing new services effectively.

Figure 4. NSD process and success factors in the transition process of industrial service providers.
Especially for the *Search stage* in the NSD process, deep understanding of the customers’ production and business processes, as well as efficient need assessment are crucial for successful development. On the other hand, a fast reaction to the changing client needs is also important in the *Implementation stage* of the NSD process. Technological factors play a major role in the *Implementation stage*, and the ability to network and build trust is important in *all the stages*. The organizational factors are especially related to the successful development of radically new services. In our framework, the NSD process may also deal with incrementally new services.

Measurement is also significant for the management. Thus, we also propose a “self-audit process” for the NSD process, which could include questions taking the most crucial success factors into account. The choosing of right measures for the audit depends on some fundamental questions: What is the type of service? What is the level of novelty in the service? What is the stage of development to be measured? What is the purpose of the measurement? In the audit framework we also need to consider the possibilities that the installed machinery base, the fleet, can provide for the measurements.

Organisations should also notice that new risks emerge and old ones change in the transition process from a manufacturer to a service provider. These risks must be carefully taken into consideration during the transition process, and thus a well-organised risk management process covering endogenous and exogenous risks is needed. The risks can be categorised as financial, strategic, operational and event risks. One example of risks is the image risk resulting from losing the client’s trust. For example, low service functioning can have a negative effect on the overall reputation of a highly appreciated manufacturing company or machine supplier. Therefore, it is essential to have a well-adjusted service concept when entering the service business. The trust of the customer can fade if the machine and service selling are bundled together too tightly or the pricing of the service is too unclear or hidden. Internal risks connected to organisational culture and behavioural processes are also typical in the transition process. According to Gebauer et al. [43, 44], cognitive phenomena limit the managerial motivation to extend the service business. This can be seen as an important reason why manufacturing companies often fail to exploit the financial benefit of extending to the service business. Loss of financial benefits is one reason why the implementation of organizational changes must be planned carefully, and behavioural dimensions should not be forgotten or underestimated. In the steps of the transition process, one must also consider the different risks that are connected for example to the customer relationship, contracts and responsibility. Further studies of risks in the industrial service business are still needed.

The services discussed in this paper are industrial services, typically e.g. maintenance and development services supporting the efficient use and the whole life-cycle of industrial assets. These types of services and the factors affecting their success in this type of context have not yet been widely studied when considering the increased potential of the services related to the industrial environment and physical assets. Due to the limited focus in the present study, there is a need for further studies of success factors within different types of services in different industrial sectors. In addition to studying the influencing factors, the research of new methods and processes supporting the transition from the machinery-based business to the development of performance-based services and value partnerships are significant topics for future studies.
5. References


