

“Service Innovation: Managing Innovation from Idea Generation to Innovative Offer”

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Abstract

This descriptive report has explored the relation between management in service firms, service characteristics and firm characteristics during the innovation processes of service firms operating at the Dutch market. The research items have been profiled on the basis of a theoretical review of the service management literature. Differences in definitions, typologies, approaches, schools of thought, characteristics, innovation types, dominant innovation motives, service design, organizational features and management have been considered, and it is proposed that the organization of an innovation process within service firms is contingent with the type of service offered. The report concentrates on the relation between service firm characteristics, service characteristics and management aspects of the innovation process within service firms. In order to highlight these differences, the service framework of Slivestro et al. 1992, extended with a new description “installation service” and the innovation descriptions of the community innovation survey (CIS) extended with the new description “recombinatorial innovation” are used to guide the research activities. Research in service innovation is highly relevant since great changes take part in this growing industry. During the last three decades scale and complexity of services increased considerably due to increased competition, social and political changes, critical customers and easy access information. All these changes force service organizations to innovate. Despite the widely acknowledged importance of the service industry, it is the least studied and least understood part of the economy. A valuable contribution to the conceptual clarity of service innovation initiatives and managerial aspects is presented in this report, concluding that the innovation process of service firms is contingent upon their service characteristics and type of innovation.

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Preface

This Master thesis, from now on called report, is the final research project for receiving the Master of Science degree in Business Administration, specialism Service Management, at the University of Twente. The research has been carried out at Exser, Dutch centre for service innovation.

Interest in service research has emerged from my personal nature and hospitality background. I was employed at the hospitality industry for almost ten years and received my Bachelor in International Hospitality Management (2005). After graduating I wanted to gain more insight in the broad service industry and participated in a fast forward management traineeship program. During this program I gained knowledge from logistic, governmental, education and training services. These new insights on services and the different ways in which they are organized triggered the start of my academic journey and research.

I wish to thank all people whose help in creating this thesis is greatly appreciated. I specially want to thank my supervisor at Exser Fabian Spaargaren, for his positivism, support, advice and encouragement. I thank my supervisor at the University of Twente Bart Nieuwenhuis, for his enthusiasm, critical insights, support and pragmatism. Meindert Flikkema of the Vrije Universiteit Amsterdam, for his excitement, suggestions and methodological insights. Frank Kwakman from Nyenrode business University, for his valuable start-up assistance and background support. Inge Boomkamp, for her assistance at selecting best suitable statistical tests. It has been a great pleasure to work with you all.

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Also I want to thank my colleagues at Exser for their interest in my research and a pleasant working atmosphere.

Finally I would like to direct my warmest thanks to my parents, families and friends for always supporting me in every way they possibly could.

Almere, August 2010

1. Introduction

75% of the Dutch Gross Domestic Product is realized through services, and around 80% of the Dutch working society is employed in this industry (CBS, 2008). An equivalent distribution is visible throughout Europe (Figure 1, CBS, 2008). Despite the widely acknowledged importance of the service industry, it is the least studied and understood part of the economy (Flikkema & Jansen, 2004).

Services have been around since the start of human life and diversity has always been high. Due to this diversity, services cannot be viewed as a “common” phenomenon, instead a differential view, highlighting their operational differences is required.

During the last three decades, scale and complexity of services increased considerably. Higher pressure from competition, due to globalization and fast growing market like China and India, social and political changes, critical customers and easy access information resulting in increased customer demands are examples of dimensions forcing organizations to provide services in an increasingly effective, more efficient and sustainable manner.

The service sector expelled the manufacturing industry from its first position, as presented in Figure 2; the European economies reached the tipping point around 1987. From 1987 on, the western service GDP percentage points have grown to almost 80% and other economies are rapidly following.

But services are not only provided in the traditional service sectors. While zooming in on the manufacturing industry the growth of services is also clearly visible. Manufacturing firms increasingly start to concentrate on the provision of service activities beyond their product activities. This phenomenon is described in literature as “Servitization” (e.g. Vandermerwe & Rada, 1988; Wise & Baumgartner, 1999; Mathieu, 2001; Shawney et al., 2004; Brax, 2005; in Almeida, Cauchick Miguel, & Da Silva, 2008, Neely, 2009). In short “Servitization” describes the ongoing development of manufacturing organisations increasingly developing product related services, with the aim to differentiate and gain competitive advantage.

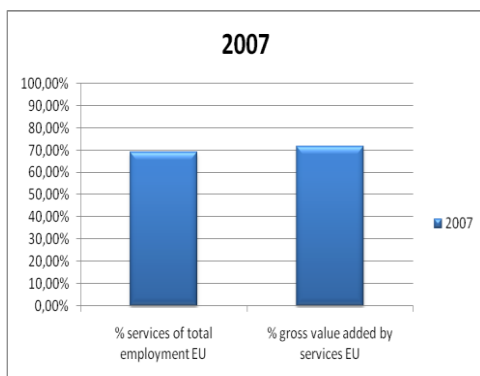


Figure 1: EU service employment and GDP Figures, CBS (2008)

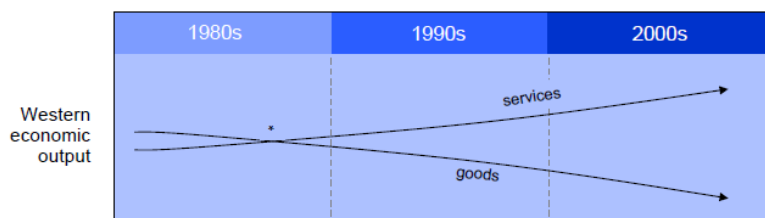


Figure 2: The macroeconomic shift from Manufacturing to services, tipping point 1987, Tekes (2007)

As became clear, service activities are necessary requirements to stay competitive in today's market environment. However, where did this enormous growth in services come from?

The market environment has changed, constant development of technique results in easy access information, increased knowledge and fast communication possibilities "In the words of the Boston Consultancy Group consultants, most firms in the global economy are now forced to compete with everyone, from everywhere, for everything" (Sirkin et al., 2008 in Dervitsiotis, 2010). These changes do not only affect firms but influence the behaviours of customers as well. As a result, firms constantly have to adapt to changing circumstance and customer demands in a rapid way, which makes insight on innovation crucial. All these changes provide new knowledge while they also demand new insights and ways of operating. Operationalization of this new knowledge results in a rising demand for services. In order to underpin this statement, couple of developments are highlighted.

First of all, globalization (Tidd & Bessant, 2009; Dervitsiotis, 2010), the breakdown of traditional trade barriers and the collapse of the Berlin Wall in 1989 were the first signs of today's global economy. Nowadays, firms have to anticipate on competition from different markets. Globalization does not stand still, emerging markets like Brazil, Russia, India and China are ready to become important players, resulting in an increased range of competition as well as the availability of (unfamiliar) markets and segments. In order to stay competitive, firms need new knowledge and have to work on distinctive ability. Secondly, the Increased use of IT applications (Tidd & Bessant, 2009), made it possible to share information in a rapid way, resulting in well informed and connected parties. Furthermore the use of IT creates new possibilities for marketing purposes, operational processes etc. Thirdly, as a result of globalization and IT, new communication channels are possible resulting in higher accelerations of knowledge production, (Slater & Naver, 1995; Bass, 2000; Jansen, Vera & Crossan, 2009). The organisation for economic co-operation and development (2009) for example estimates that the public and private sector together spent around \$1 trillion each year in order to create new knowledge. Another result of new communication channels results in the fourth point, (social) community building and networking. Community building provides new challenges in the gathering of information (Ahuja, 2000; Burt, 2000). Finally, the accessibility of IT increased the availability of prototyping and simulation tools which even reduced the separation between users and producers (Tidd & Bessant, 2009).

1.1 Scientific relevance

Research on innovation splits into two main streams of inquiry (Adler, 1989 in Brown & Eisenhardt, 1995). Firstly, an economic oriented tradition concentrating on innovation from a macro economic perspective, aiming at differences between innovation patterns across and within countries and sectors and the evolution of technology. Secondly, an organizations oriented tradition, focusing on innovation from a micro level perspective, here the focus is on structures and processes. Although this report includes some economical aspects it mainly focuses on the organizational tradition.

As presented during the introduction of this report, the interest for innovation in services increased considerably during the last three decades. Traditionally innovation management is studied with a great focus on the manufacturing industry, in which technology was leading. However, in line with the enormous growth of services, new management approaches need to be defined to guide innovation activities within services (Frei, 2008).

While studying service firms, there are at least two complicating factors. The first one refers to a multidisciplinary analysis needed. Services include different domains of knowledge, customer types, technology utility etc. A multidisciplinary approach provides insight into the distinctions between the various innovative activities within the service industry (Vence & Trigo, 2009).

The second complicating factor refers to the high degree of heterogeneity of services. At the start of the service innovation research, around 1980 services were viewed as homogeneous while in fact they are heterogeneous. For example, there are not only differences between hotels and consultancy firms, but even within these branches e.g., a conference hotel operates differently than a leisure hotel. Both service forms have different characteristics, not directly comparable. This situation describes both intrasectoral as well as intersectoral heterogeneity (Flikkema, 2008; Vence & Trigo, 2009).

The visible growth, the need to innovate and the heterogeneous character of service industries requires more research on different behavioural innovation patterns within this essential industry. At the moment, there is little fragmented information available specifically concentrating on managing innovation in service firms. A comprehensive innovation management model in service firms is not yet apparent in the literature and increasingly needed to guide innovative activities (Den Hertog, 2000). The aim of this conceptual research is to contribute to more clarity on the management of innovation within service firms.

1.2 Governmental relevance

The government plays a contributive role in relation to service innovation, e.g. funding, regulation and procurement influence the activities of service firms. The current innovation policies of most ministries of economic affairs are almost entirely focused on technological innovation in the narrow sense of the term (Viitamo, 2007; Flikkema, 2008), these policies need to be revised.

In today's rapid changing environment innovation is necessary to keep up with competitors or one step ahead. At first sight it seems irrelevant to stress the importance of continuous innovation, since innovation is assumed as being a familiar business element already. The real world is actually disappointing, most service firms are not ready for innovation yet (Preissl, 2000), which is a problem for both firms, as well as the socio economic development of the Netherlands. Services are of great relevance to our economy and workforce, as well as, our export activities. According to the Dutch Minister of Economic Affairs (2009), Service innovation is necessary to generate more jobs and growth, since the service industry keeps the Dutch economy running.

1.3 Exser, Dutch centre for service innovation

This report is commissioned and supported by Exser, Dutch centre for service innovation. Exser is a joint initiative of several innovative service providers and “Almere Kennisstad”. The Dutch government, the municipality of Almere and the province of Flevoland supported this initiative. The main goal of Exser is to reinforce the innovative growth of the Dutch service sector, in a bid to enhance the competitive strengths of the Netherlands. Existing innovation programs primarily focus on the development of new technologies for the benefit of the manufacturing industry, usually with a focus on the use of the new technologies involved. This is remarkable since technology is only one of the factors that determine the success or failure of an innovation. Exser focuses on the development and provision of knowledge and experience involving the social and management-related elements of innovation. Exser promotes a culture for excellent service innovation, allowing service providers and government to benefit from service-oriented research and education in the Netherlands.

2 Research Questions

The aim of this report is to contribute to the research on management of service firms and focuses on the scientific domain of innovation in service. The research is explicitly designed to gain insight in the way different service firms manage their innovation trajectories and to provide insight in characteristics of services, which may contribute to conceptual clarity in the service domain. Based on these elements of reference, the following research questions have been formulated:

2.1 Main question

Research question: *How do the management of innovation in service firms, service characteristics and firm characteristics relate?*

In order to guide the research, the above research question is divided into sub questions presented below.

2.2 Sub questions

1. Where do ideas for innovation in service firms come from?
2. How are ideas for innovation in service firms transformed into marketable and valuable offers for new or existing customers?
3. Which characteristics of service firms, service type, innovation type, and customer served vary in relation to the management of innovation in service firms?

The sub questions as presented above are summarized in the following research model.



Figure 3: Research model

The first block of interest refers to the traditional NACE ("Nomenclature statistique des Activités économiques dans la Communauté Européenne") classification of economic activities. This classification is used to ensure that the sample is representative for the service sector. The second block concentrates on the strategic motives of service firms to innovate. Why are service firms performing innovative activities and are there differences between sectors, sizes and operational markets?

Thirdly the way innovations are managed are included in this research. In respect to management, the primary focus lies on process elements; how are ideas generated and translated into opportunities, how are these opportunities selected and how do they contribute to the overall strategy and create value?

The final building block sheds light on the outcomes of the innovative initiatives. What are the characteristics of service innovation and do differences between service types exist?

The ultimate goal of this research is to recognize patterns in the way various types of service firms manage innovation and to develop a better understanding of this important industry.

2.3 Literature search

In order to find relevant articles related to concepts of service innovation, a broad range of sources have been investigated. While selecting journal articles, impact factors of journals are taken in consideration.

The aim of the literature review is to contribute in answering the research question and to generate a more specific, less homogenous view on innovations and management aspects within the service industry.

The following search engines are used to select relevant materials; Google, Google Scholar, PiCarta, Scopus, Web of Science and SER.

In order to find relevant articles, different search items in various combinations have been used, some of the keywords during the search process of this report are: service, services, innovation, innovations, service innovation, service innovations, service development, new service development, innovation in capital intensive services, knowledge intensive services, management, managerial approaches, innovation motives, suggestion making, idea generation etc. Furthermore, a couple of articles are selected based on personal contacts from the authors with experts in the service management field.

2.4 Report Structure

The introduction part of this report includes an introduction to the topic, a short description of the initiator of this report, and the main research questions. After this introduction, the main theoretical concepts are highlighted.

The theoretical framework starts by introducing a service definition, followed by service typologies, definitions of service innovation, approaches to service innovation, schools of thought and the role of technique.

The second part, which is more micro oriented, with the exception of the dominant motives part, describes models in relation to service innovation, dominant innovation motives, management aspects of innovation in services, types of innovation in services and possible outcome characteristics.

The third section describes the methodology used to realize the research and finally in the fourth section the conclusions, recommendations and future insights are presented.

Introduction
Research questions
Theoretical framework
<ul style="list-style-type: none"> • Service definition • Typology • Innovation definition • Approaches • Schools of thought • Characteristics of services • Motives for innovation • Models for service innovation • Service innovation proces • Innovation types
Methodology
Analysis
Conclusions and recommendations

3 Theoretical framework

3.1 Services: a definition

Traditionally services are described as elements which cannot be touched; *intangible*. Due to their intangible character a service cannot be viewed as an object and in that sense are not *reproducible*. A service is viewed as an activity or process and *no transfer of ownership* takes place. Furthermore, services are interpreted as *heterogeneous* concepts, every service is unique and cannot completely be reproduced. *Production and consumption of services takes place simultaneously in co-operation with the customers*, it is hardly possible to separate these elements or produce them in advance and store them until they are requested (Gronroos, 2000).

Recently however, scholars start to question the unique characteristics of service (Lovelock, 2004). For example, it is possible to store service request handled at automated helpdesks. Times have changed and due to the use of new techniques and ICT applications, new service options occur. Since the debate is still ongoing it is not explicitly included in this report.

As a result of the infinite character of services and the debate that is still going on, there is not just one clear widely accepted definition available. Academic scholars have interpreted service in a way that best fits their research interests and paradigms.

One of the earliest attempts to codify services is to define what services are not.

“Services are actually all those economic activities in which the primary output is neither a product nor a construction” (Quinn & Gagnon, 1986).

A later attempt points attention to the use of capabilities and competences in order to create a solution,

“To produce a service is to organize a solution to a problem (a treatment, an operation) which does not principally involve supplying a good. It is to place a bundle of capabilities and competences (human, technological, organizational) at the disposal of a client and to organize a solution, which may be given to varying degrees of precision” (Gadrey, Gallouj, & Weinstein, 1995).

Another option is to condense and reduce services into something a party actually offers,

“Any activity or benefit that one party can offer to another that is essentially intangible and does not result in the ownership of anything” (Kotler, Marketing Management: Analysis, Planning, Implementation and Control, 1997).

More recent literature emphasizes the interaction of service customers and service producers resulting in the following definition:

“A service is a process consisting of a series of more or less intangible activities that normally, but not necessarily always, take place in interactions between the customer and service employees and/or physical resources or goods and/or systems of the service provider, which are provided as solutions to customer problems” (Gronroos, 2007).

From above mentioned definition in literature we conclude that a service cannot be described as a product or construction. A service is an intangible element. A service is a perception of reality. The goal of a service is to provide a solution to a customer problem while making use of human centred competencies and capabilities. However this solution only transfers the customers' perception of reality, the outcome does not result in actual ownership. In our opinion, the transformation of reality is more relevant than the tangibility question of a product or a service. Furthermore, during the service delivery process, cooperation between client and provider takes an essential role and influences the customer's perception. Based on these foundations, for the research presented in this report we adopt the following definition of Flikkema et al. (2007):

***“A service is an attempt to transform customer B's reality C, as constructed by its service provider A, at the request of B and frequently in cooperation with B”.
(Flikkema et al., 2007)***

3.2 Service typology

Since the heterogeneity of services is high (Flikkema, 2008; Vence & Trigo, 2009), it might be possible that different characteristics have an effect on innovation initiatives. Consequently, insight in this heterogeneity aspect is a basic requirement for analysing service innovation.

Typologies can be viewed as tools, assisting the description of an organizational phenomenon, it highlights the interaction between various elements (Paswan et al. 2009). A typology is more than a simple classification scheme. Through a service typology it becomes possible to display the connections between multiple variables and to contribute to the categorization of service initiatives.

During the last three decades some authors have tried to make useful classifications, in all kind of ways, for example Silverstro, 1992; Sunbo, 1997; Lovelock, 2000; Den Hertog, 2000; Coombs & Miles, 2002; Howells & Tehter, 2004; Vence & Trigo, 2007; Aslesn & Isaksen, 2007; Viitamo, 2007; Pyoung Yol & Woosung, 2008.

Recently the attempts to classify services are shifting from a production approach to a knowledge economy and flexible production mode (Baker, Miles, Rubalcaba, Plaisier, Tamminen, & De Voldere, 2008). Due to these new insights, authors (e.g., Viitamo, 2007; Pyoung Yol & Woosung, 2008) start to make an attempt to create a taxonomies in line with these developments. Kox and Rubalcaba (2007) for example distinguish between operational services mainly providing standardized business services and knowledge intensive business services (KIBS), highly focused on client-specific services with a high knowledge content. So far, all described attempts to characterize service activities mainly focus on the importance of client interactions during the service process. This point of references is not surprising since the co production between customers and suppliers provides valuable inputs in relation to design, production and delivery of services (Baker, Miles, Rubalcaba, Plaisier, Tamminen, & De Voldere, 2008).

Viitamo (2007) refers to the customer oriented background as well. However Viitamo enlarged the stream of thoughts by incorporating the relative level of capital intensity in his model. Viitamo's first dimension concentrates on the input of labour and capital. The second dimension gives attention to the tangibility level of input or outputs and the complexity levels of the work that needs to be done. The aim of this dimension is to make a distinction between capital intensive processes relying on technological assets and capabilities and labour intensive processes based on non-technological assets and capabilities mainly referring to skills, competences and expertise. The third dimensions, which is not explicitly incorporated in the original model relates to the degree of customization.

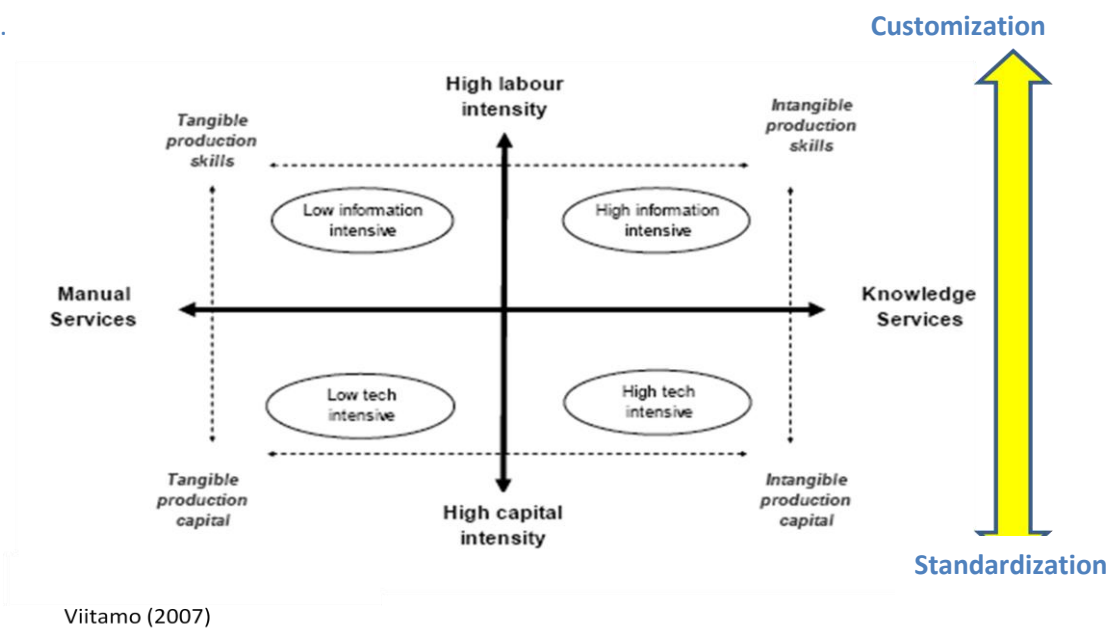


Figure 4: Typology Viitamo (2007)

3.2.1 Silvestro et al's service archetypes

Without devaluating the other existing service archetypes and typologies, in this report Silvestro et al.'s (1992) service archetypes are used as a point of reference. We decided to make use of this framework since it is widely used and often cited. Furthermore, it incorporates valuable service archetypes useful to distinguish different types of service firms. Based on the six dimensions, presented below, Silvestro et al. (1992) were able to create a cohesive framework resulting in the identification of three service archetypes, professional services, mass services and service shops. The different elements of this model are elaborated below.

3.2.1.1 Silvestro et al's service dimensions

Equipment/people focus

"Equipment-focused services are those where the provision of certain equipment is the core element in the service delivery. People focused services are those where the provision of contact staff is the core element in service delivery" (Silvestro, Fitzgerald, & Johnston, 1992; original authors, Thomas, 1975; Kotler, 1980). An example of equipment-focused service are train services, an example of people focused service is consultancy.

Customer contact time per transaction

"High customer contact is where the customer spends hours, days or weeks in the service system, per transaction. Low customer contact is where the contact with the service system is a few minutes" (Silvestro, Fitzgerald, & Johnston, 1992; original author, Chase, 1978; 1981).

Degree of customization

"A high degree of customization is where the service process can be adapted to suit the needs of individual customers. A low degree of customization is where there is a non-varying standardized process; the customer may be offered several routes but the availability of routes is predetermined" (Silvestro, Fitzgerald, & Johnston, 1992; original authors, Maister, 1983; Johnston & Morris, 1985; Haynes, 1990).

Degree of discretion

"A high degree of discretion is where front-office personnel can exercise judgement in altering the service package or process without referring to superiors. A low degree of discretion is where changes to service provision can be made only with authorization from superiors" (Silvestro, Fitzgerald, & Johnston, 1992; original author, Lovelock, 1983).

Value added back office/front office

"A back office oriented service is where the proportion of front-office (customer contact) staff to total staff is small. A front-office service is where the proportion of front-office staff to total staff is large" (Silvestro, Fitzgerald, & Johnston, 1992; original author, Maister, 1983).

Product/process focus

"A product-oriented service is where the emphasis is on what the customer buys. A process-oriented service is where the emphasis is on how the service is delivered to the

customer” (Silvestro, Fitzgerald, & Johnston, 1992; original author Johnston & Morris, 1985).

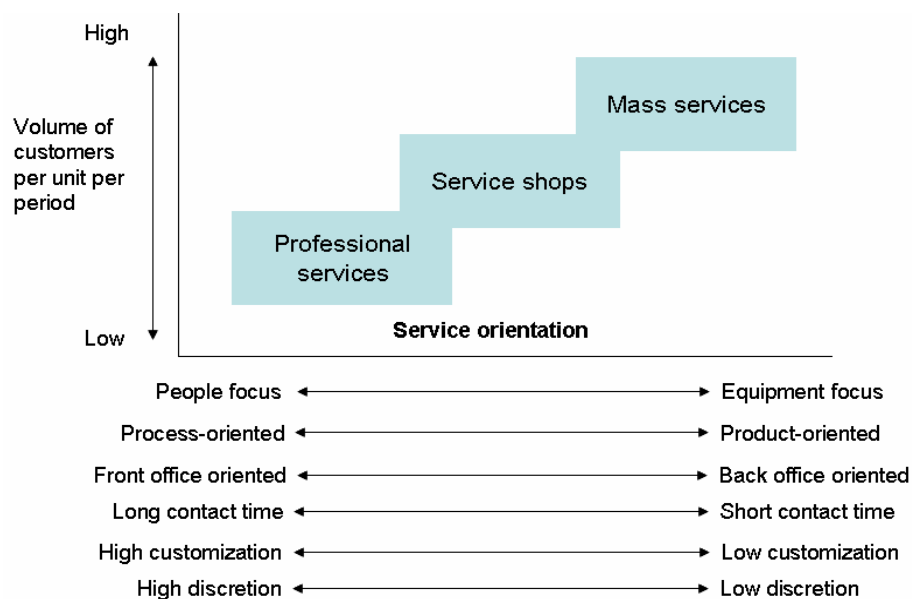


Figure 5: Service Archetypes, Silvestro et al. (1992)

3.2.1.2 *Silvestro et al's service descriptions*

Based on the elements above, Silvestro et al. developed three main service types as presented below.

Professional Services

In which the customer often actively participates in the process of defining the service, detailing his/her individual requirements; negotiation of the service specification thus forms part of the service process (human intensive, knowledge intensive and customized services).

Mass services

In which specifications are determined prior to the customer's participation in the service process; they are built into the service design, rather than being individually negotiated with each customer during the service process (capital intensive, high volumes and standardized services).

Service Shops

Are not explicitly defined by Silvestro ET al. (1992) according to those authors, shops are centred in the middle of the two other types. The service elements in a service shop are modular, the customer shops the relevant elements together. In accordance to Verma (1998) service shops are characterized by low labour intensity but high customer contact/customization. They are similar to a job shop type of operation in manufacturing. A service shop is able to provide varied customized services to its customers.

The often cited framework of Silvestro et al. is mainly focusing on the operational produce processes of various types of services, which is in line with the primary focus of our research model. The framework of Silvestro et al. is an adjustment of Schmenner's (1986) Page 18 van 91

industry level classification model with high and low degrees of interaction and customization on one axis and the level of labour intensity on the other. Schmenner (1986) identified the resulting four quadrants as service factories, service shops, mass services and professional services (Mulligan, College, & Park, 1999). The service factory disappeared in the model of Silvestro et al., this type of service evolved in the operations literature into an integrated view of product and services (Silvestro, Fitzgerald, & Johnston, 1992).

In our view the choice to exclude the service factory is no longer completely justified since today services and production processes are slightly growing to each other within the coming 10 years 50% of traditional products might be transferred into a total service package (Exser/Philips Business Beyond Products seminar 2010). Together with Flikkema, Kwakman and Spaargaren we anticipate on this trend and designed a new service archetype known as installation services, in which customization plays an important role, while the active participation of the customer is far less compared to professional services.

Installation services

These services are characterized by providing customized services. Installation service providers always try to respond to the unique customer situation. Employees are low, middle or highly educated and understand their jobs well. Although the customization is high, customers play a passive role during the service delivery process.

3.3 Service innovation: a definition

In paragraph 3.1, a definition of services has been presented. It became clear that there is no general accepted definition available yet. Although authors point attention to loosely coupled service elements they hardly provide a clear definition of service innovation as well. Still, there are some attempts for defining service innovation, as presented below.

- *“Innovations in services are a mix of reproduced (although incremental) innovations and ‘small’ non-reproduced changes to solve single customers’ problems (what we will also call ad hoc innovation). The latter is particularly a result of the customer interaction process “ (Sunbo & Gallouj, 2000).*
- *A service innovation is a new service or such a renewal of an existing service which is put into practice and which provides benefit to the organization that has developed it; the benefit usually derives from the added value that the renewal provides to the customers. In addition, to be an innovation the renewal must be new not only to its developer, but in a broader context, and it must involve some element that can be repeated in new situations, i.e. it must show some generisable features(s). A service innovation process is the process through which the renewals described are achieved (Toivonen & Tuominen, Emergence of Innovations in Services: Theoretical discussion and two case studies, 2006).*

While summarizing these statements, it becomes clear that the service innovation process is the process through which renewals are achieved (Toivonen & Tuominen, 2006). This process has a multidisciplinary nature, since different stakeholders are involved during the design of the concept, the service system and launch (Edvardsson, 1997). The actual outcome might be a combination of various existing elements or totally new offers (Preissl, 2000). The final goal is to fulfil customer needs in a valuable (both for the customer as well as the firm), high quality way. By combining these elements the following definition can be given:

“Service innovation is the multidisciplinary process of designing, realizing and marketing combinations of existing and/or new services and products with the final attempt to create valuable customer experiences”(Flikkema et al. 2010)

3.4 Service innovation approaches

It became clear that there are no generally accepted definitions available yet. This is not strange, scholars employed at least three approaches to describe, analyze and explain innovation in service (Flikkema, Jansen, & Van der Sluis, 2007; Flikkema et al., 2008; Den Hertog et al., 2008; Chamberlin et al., 2010) all taking an other point of reference

The first one is the *assimilation approach*, focusing on technological change, innovation in services is seen as fundamentally similar to innovation in manufacturing, that is, as the production and the use of technologically advanced artefacts (Tether, 2005 in Flikkema, 2008), and it should therefore be studied using methods and constructs of manufacturing. Second the *demarcation approach* which views service innovation as substantially different from manufacturing, and new theories, instruments and indicators have to be designed to understand innovation in service contexts. Finally, the followers of the *synthesis approach* recognize that studies of innovation in services points’ attention to the neglected aspects of innovation processes in general, highlighting different types of innovation.

The latter two approaches emphasize the relevance of non-technological aspects of innovation. In this respect, that what matters most from a global economic point of view is the impact on manufacturing productivity, of the use of innovative services rather than innovation in the production and development of those services (Chamerlin, Doutriaux, & Hector, 2010). The question is which approach is right, however is there a wrong or right?

The assimilation approach seems relevant since services make intensive use of technology. The distinguishing factor however, is the fact that service firms use these techniques in a more creative way. On the other hand, the demarcation approach is making sense as well since the technique use is indeed substantially different at least to some extent. Based on these two reasoning’s it is most relevant to follow the synthesis approach.

3.5 Schools of thought

Besides the three innovation approaches to describe, analyze and explain innovation in service, there are at least two schools of thought that have been popularly followed (Chamerlin, Doutriaux, & Hector, 2010). The first one is the “supplier-dominated perspective” mainly based on the work of Keith Pavitt (1984), who designed taxonomy of innovation and classified service firms as being passive adopters of new technologies developed by the manufacturing industry.

This perspective highlights the technology driven approaches on innovation that dominated much of the innovation literature during the early 1980s till mid-1990s. The second school of thought is known as “The Lille School” and mainly inspired by the ideas of Gallouj. This stream argues that service innovation needs a broader perspective than just technology. This stream is also supported today, by for example Den Hertog (2000) who indicates that although, services play a large contributive role to innovation, they are not merely passive recipients of other innovations, they are designers as well. Furthermore Den Hertog argues that the recognition of the importance of non-technological elements and approaches to service innovation is increasing.

3.6 Characteristics of service innovation

Some characteristics of services (e.g. intangible, heterogeneous, not reproducible, simultaneous consumption and production, no transfer of ownership, inseparable) are already mentioned in paragraph 3.1.

Within service studies, there are quite some elements that need to be specified or need further refinement. Although the definitions on service are still under construction, it is clear that service innovation contains unique characteristics, presented in this part of the report.

Service innovation can be viewed as an internally oriented and externally oriented interaction process (Sunbo & Gallouj, 2000). Service innovation can be viewed as an internal interaction process, i.e., a collective process in which both employees and managers participate on informal and formal levels. Service firms treat their innovation activities as differentiated unsystematic patterns and most of the times, in contrast to the manufacturing industry, little attention is paid to formalized or systematic structures (Sunbo & Gallouj, 2000).

Service innovation can also be viewed as an external process that mainly focuses on interaction with (potential) customers, with the final goal to create high quality customer value. Traditionally, service firms are much stronger at defining a core service surrounded by supportive services during the delivery (Edvardsson, 1997; Sunbo & Gallouj, 2000). However, due to Servitization, it can be argued that this difference becomes blurred. Den Hertog (2000) incorporated this already in his research activities; *“there is a difference between highly standardized services products or formulas with quasi good characteristics and customized services. Customized services are often based on more tacit forms of knowledge and higher forms of co-production between service provider and customer”* (Den Hertog, Knowledge-Intensive Business Services as Co-Producers of Innovation, 2000), these ideas fit with the ideas of Silvestro, Fitzgerald and Johnston (1992).

The rapid pace of change in technologies is affecting service design and performance (Leek, Turnbull & Naude, 2003; Hipp and Grupp, 2005 in Carbonell et al. 2009). In relation to technique, Gallouj and Weinstein (1997) argue that competences mobilised by a service firm, and their technical characteristics, encompass not only technologies in the narrow sense of the term, and the competences relating to those technologies, but also the "technologies" specific to services (legal, financial, actuarial, human resource management, commercial etc.) and the competences corresponding to them. The latter shows, that technical aspects of service delivery exist in both physical as well as social compositions, while talking about technical aspects in relation to service innovation, these two angels should not be mixed-up.

Finally, when innovation in service industries is compared with innovation in manufacturing industries it is observed that service industry firms focus more on organizational innovations than manufacturing firms who tend to introduce more product and/or process innovations (Chamerlin, Doutriaux, & Hector, 2010).

3.7 Innovation types

This section defines the innovation types of service firms. Although it might be interesting to define outcome characteristics like technological - non-technological, esthetical – non esthetical. We prefer to make use of a broader angle, and during this section we follow the ideas of the Community Innovation Survey (2008), Tidd & Bessant (2009) Flikkema, Kwakman, Spaargaren en Vos (2010) who focus mainly on the forms and aspects of service innovation.

3.7.1 Forms of service innovation

Different authors address possible types of service innovation (e.g., Sunbo & Galouj, 2000; Preissl, 2000; Damanpour, Walker & Avellaneda, 2009). Traditionally, we can distinguish three main forms of service innovation (Tidd & Bessant, 2009; Flikkema, Kwakman, Spaargaren & Vos, 2010), process innovation, product innovation and organizational innovation. During this section we prefer to highlight the innovation types of the Community Innovation Survey (2006-2008) which is a highly valuable and recognized innovation monitor. The Community Innovation Survey incorporates these three innovation types as well, although some adjustments are needed. First, it is very hard for service firms to clearly differentiate between process innovations and organizational innovations (Preissl, 2000), because these two types of innovation are directly related to each other. Rearrangement of the workforce for example automatically results in a different way of operating. Secondly, the CIS incorporates both service and product innovations in the term product innovation. We prefer to highlight the differences between products and services and provide them with a unique service innovation definition. Finally, the CIS incorporates environmental innovation, due to an increasing interest for social responsible entrepreneurship. Nevertheless, it might be difficult for service firms to differentiate between environmental and process or marketing innovations.

Process innovation	Product innovation	Recombinatorial innovation	Marketing innovation
New or significantly improved production process, distribution method or support activity	New or significantly improved capabilities, user friendliness, components or sub-systems	A new composition of services or products and services	A concept or strategy that differs significantly from existing methods, not used before

3.7.1.1 Process innovation

“A process innovation is the implementation of a new or significantly improved production process, distribution method, or support activity for goods or services. Process innovations must be new to your enterprise, but they do not need to be new to your market. The innovation could have been originally developed by your enterprise or by other enterprises” (CIS 2008).

3.7.1.2 Product innovation

“A product innovation is the market introduction of a new or significantly improved good or service with respect to its capabilities, user friendliness, components or sub-systems. Product innovations (new or improved) must be new to your enterprise, but they do not

need to be new to your market. Product innovations could have been originally developed by your enterprise or by other enterprises” (CIS 2008).

3.7.1.3 Recombinatorial innovation

“A recombinatorial innovation is the commercialization of a new composition of services or products and services, that previously did not exist on the market in which the firm operates” (Flikkema et al. 2010).

3.7.1.4 Marketing innovation

“A marketing innovation is the implementation of a new marketing concept or strategy that differs significantly from your enterprise’s existing marketing methods and which has not been used before. It requires significant changes in product design or packaging, product placement, product promotion or pricing. Exclude Seasonal, regular and other routine changes” (CIS 2008).

3.7.1.5 Environmental innovation

“An environmental innovation is a new or significantly improved product (goods or service), process, organizational method or marketing method that creates environmental benefits compared to alternatives. The environmental benefits can be the primary objective of the innovation or the result of other innovation objectives. The environmental benefits of an innovation can occur during the production of a good or service, or during the after sales use of a good or service by the end user “(CIS 2008).

3.8 Dominant motives for service innovation

In this section the dominant motives of service firms to innovate are presented. The section starts by highlighting the strategic motives of service innovation as highlighted by Tidd & Bessant (2009), followed by a section of motives inspired by the STEEPV factors (Social, Technological, Economic, Environmental, Political, Values- ethical) (Flikkema, 2007; 2008)

3.8.1 Internal motives of service innovation

The strategic position of a service firm is partly defined by the environment, expectations and purposes of stakeholders to participate in business relations and the firm’s available resources and competences (Johnson & Scholes, 2002). These items are central to the future strategy of a service firm and raise important questions to think of.

In order to assess the abilities and disabilities, managers should analyze their firm from a strategic management perspective. Strategic management refers primarily to positioning, choices and actions undertaken by a service firm (Johnson & Scholes, 2002). Due to continuous reductions of cycle times, increased competition, new technological advancement and globalization, a variety of strategic perspectives have been developed and emphasized the importance of innovation (Stalk & Hout, 1990; Kessler & Chakrabari, 1996; Menon, Chowdhury & Lukas, 2002; in Tidd & Bessant, 2009).

First of all, although technical and market changes can never be fully controlled, proactive development can influence the competitive success, adaption, and renewal of service firms (Brown & Eisenhardt, 1995). Service firms are able to experience *first-to-the-market advantages*, the strategic goal of this first-market entry is, to offer something no one else

is capable of. Second, it might be very interesting to offer a particular service outcome in a way that others cannot match; faster production cycles, cost reductions and high levels of customization are some examples of possible process novelties. Thirdly, some service firms realize very complex services in order to make it difficult for others to copy these services. In relation to this last-mentioned motive, careful planning is essential. Fourth, it is possible to create strategic advance by creating unique services and to protect these service offerings, by licensing or other fees. Fifth, it might be beneficial to move the strategic direction, by for example focussing on quality.

As illustrated, service innovation creates new opportunities to obtain strategic advantage. Innovation options are everywhere the challenge however is to actually see these options and develop them. The strategic perspectives as presented above requires a shift in management focus from a traditional “cost orientation” to a “time orientation” suitable for fast changing environments.

Internal Motives	External Motives
Proactive development Competitive success, adaption & renewal Strategic motives First market entry Process novelties Complex services Licensing Move direction	Social change Technological change Economical change Environmental change Political change Value ethical change

3.8.2 External motives for innovation

Service firms are highly influenced by their environment. The operational environment is far from stable and constantly subjected to change. Although all changes in the end related to strategic considerations, the elements presented below provide some basic insights related to the environmental challenges a service firm needs to cope with.

3.8.2.1 Social change motives

Nowadays, customers are more assertive and well informed. The degree to which customers are given the opportunity (or are forced) to co-produce is an important aspect of service innovation. Furthermore, feedback from customers can shape innovations in service firms, just as much as service firms can influence their customers’ innovation (Den Hertog, Knowledge-Intensive Business Services as Co-Producers of Innovation, 2000).

3.8.2.2 Technological change motives

In Physical sense, the impact of for example the Internet revolution as started on B2C level in 1993 created new opportunities for service firms and with that stimulated their innovative abilities.

3.8.2.3 Economic change motives

At the moment it becomes a trend to concentrate on the core business and to outsource additional areas. More and more traditional organization functions are taken over by specialized service firms. In some outsourcing relationships, activities are precisely defined and competition in these areas might be high, in such cases innovation is less likely. In other cases there is sufficiently level of specialization to provide innovative

solutions. For example, firms make progressively more use of for example specialized HRM organizations which are increasingly capable of total human resource solutions (Den Hertog, Knowledge-Intensive Business Services as Co-Producers of Innovation, 2000).

3.8.2.4 Environmental change motives

Natural energy resources are declining. In response on these developments there is a rise for Energy efficiency. The growing requests for energy efficiency create new opportunities for service innovation. Virtualization of computing for example allows software as a service which opens up possibilities for economy of scale in computing.

3.8.2.5 Political change motives

The government can be a quite important motivation for innovation, when innovation is promoted by R&D funding and/or procurement decisions or through new regulations e.g. those fostering environmental innovation (Den Hertog, Knowledge-Intensive Business Services as Co-Producers of Innovation, 2000).

3.8.2.6 Value-ethical change motives

In relation to these motives we can look at values in general like the rise of prosperity in Western economies or sustainability issues. These items are important motives to innovate, however, besides these elements, often more related to general awareness it is important to pay attention to service professional trajectories. Trajectories are ideas and logics that are diffused through the social system (Sunbo & Gallouj, 2000). Methods, general knowledge and behaviour rules that exist within the different service professions can be classified as the main innovation source within this perspective. General management ideas or ideas for new organizational forms trajectories; motivational systems, BPR, service management etc are of influence as well. (Sunbo & Gallouj, 2000). In relation to social compositions, service firms start orient on intern innovation. Aftercare, education of employees, inventive organization schemes etc. Are some examples. Especially manufacturing firms are increasingly realizing the importance of additional services in relation to competitiveness (Den Hertog, Knowledge-Intensive Business Services as Co-Producers of Innovation, 2000).

3.9 Service innovation models

The next step is, to translate the above mentioned motives to an actual innovation. Before we turn to the actual innovation process, it is important to get insight in the basic layers of service innovation. We provide this insight by drawing attention to three leading management models.

3.9.1 Edvardsson's strategic frame of reference (1997)

In relation to new service development, Edvardsson (1997) introduced a frame of reference for strategic service development, with quality as the point of reference. In Edvardsson's view, service development includes the whole process from idea generation to the market introduction of a new service. Edvardsson's frame is the result of a number of studies, pilots and testing within the Service Research Centre in which he participated. In accordance to Edvardsson, the outcome of a service development process constitutes the prerequisites for the service by three concepts as explained beneath: the service concept, the service process and the service system and resource-structure.

3.9.1.1 (Service) concept

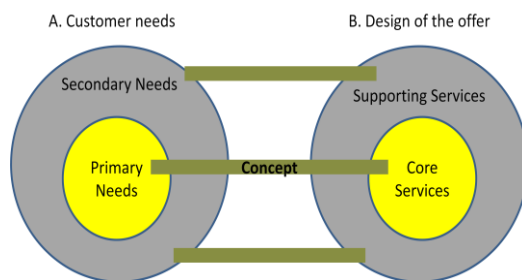


Figure 6: concept model, Edvardsson (1997)

The function of the service concept is to create a starting point, an overview of the basic elements, which need to be present in order to realize a high quality service offering. A service concept can be interpreted as a detailed description of both the potential customers' needs, as well as the way in which services are designed to fulfil these needs. While designing a service offering it is useful to specify the needs with respect to extent and nature (primary and secondary needs, core service and supportive services). The result of a service concept is a prototype of the service, which describes the actual customer value of the service and its related sub-services (Edvardsson, 1997).

3.9.1.2 Service process

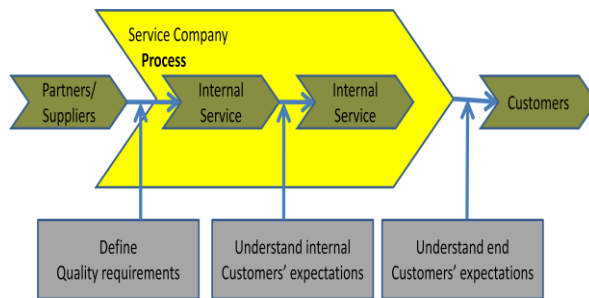


Figure 7: Service process, Edvardsson (1997)

Regularly, a service process is not a single activity, but a process of mutual sometimes sequential steps. Since services are partly co produced with customers and/or suppliers, a service firm is not able to influence direct control over all activities, however, a service firm should be able to control the entire process. A service process can be interpreted as a design model for a variety of customer processes, it precisely describes micro-processes, standardized and alternative activities, which take place when a customer activates a service process (Edvardsson, 1997).

3.9.1.3 Service system

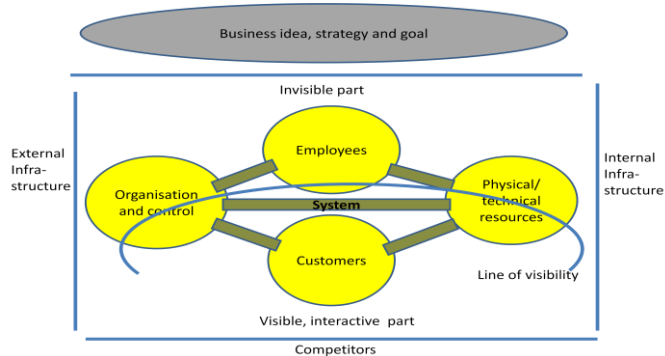


Figure 8: Service system, Edvardsson (1997)

The service system includes all the resources available in order to realize a service. Resource allocation is, to some extent, influenced by, strategy, business concepts and firm goals. Although, resources are firm specific, we can generally classify four types of resources; *customers*, *organizational structure and systems*, *management and staff* and *physical/technical resources*. The service system can be divided in front office and back office operations. Front office operations refer to the interactive parts of the service which are clearly visible to the customers. The back office refers to support activities, often invisible for customers. Furthermore internal and external infrastructures play a considerable role in the division of resources and competences. The new service development process can be described using four phases: *idea generation*, *project formation*, *actual design and implementation*. The final service outcome is produced in a customer process in which, customers, the firm and subcontractor are responsible for the delivered quality (Edvardsson, 1997). This stream of thoughts has been a great source of inspiration, and forms an excellent point of reference for the research on service innovation.

3.9.2 Toivonen, Tuaminen & Brax's General, systematic service innovation model, based on Edvardsson's model (2007).

Based on the ideas of Edvardsson, Toivonen, Tuaminen & Brax designed a general systematic service innovation model, including more practical focus elements. Toivonen et al., tried to visionize the value proposition of services and renamed the service *concept* in *service structure and markets*. The most important elements in relation to this item are the structure (sub-services and their role: core versus supporting services), the role of the service in relation to the firm's product portfolio, pricing strategies and the market positioning (relevant markets and main or potential customer segments). The *process* received an extra attention to service and became *service process*. The service process calls attention to the different phases within a process, the roles of both the provider as well the users should be carefully designed. In relation to the formal aspect the form of customer interfaces plays a pivotal role, items to think about relate to concepts like personal or interactive interfaces, mass service or customized services etc. Finally the *service system* is translated in a higher concentration on the role of *resources and service infrastructures*. In relation to this category it is important to stress attention to the role of technology. Furthermore the methods and guidelines, the general organization, competences of both the provider as well as the users should be taken care of. Finally the role of subcontractors should be highlighted as well as the effects of the physical environment.

3.9.3 Den Hertog's four dimensional model of service innovation, (2000)

Another more practical point of reference is create by Den Hertog, who introduced a four dimensional model of service innovation, to map service innovation and discuss the practical development of new services or service innovation policies. According to Den Hertog service innovation involves some combinations of the bellow mentioned dimensions of service innovation. In practise, it may be a combination of the dimensions, search and selection process, that ultimately characterises each particular service innovation. The weight of the individual dimensions and the importance of the various linkages between them vary across individual services, innovations and firms.

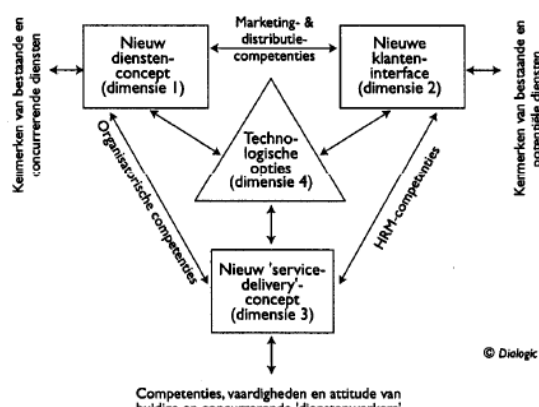


Figure 9: Four dimensional model of service innovation, Den Hertog (2000)

The four dimensions of Den Hertog's model are presented below.

3.9.3.1 Dimension 1: new service concept

Although not all service innovations have a strong novel conceptual element, conceptual innovations are much more likely to be found in services settings than in traditional manufacturing firms. Such innovations are usually highly intangible, meaning that while in some cases, the service itself may have quiet intangible elements, the new features have less to do with material artefacts.

3.9.3.2 Dimension 2: new client interface

The way the service provider interacts with the customer can itself be a source of innovation. Product offerings are increasingly marketed and even produced in a customer specific way and delivered electronically as far as they have information components. In business services in particular, customers are often also part and parcel of the production of the service product.

3.9.3.3 Dimension 3: new service delivery system

This dimension has a close relation with empowerment. Internal organisational arrangements have to be managed to allow service workers to perform their job as designed, and to develop and offer innovative services. On the one hand, new service may require new organizational forms, (inter) personal capabilities and skills. On the other hand, an organisation can be designed and employees can be trained as to leave room for innovations and non-conventional solutions to practical problems.

3.9.3.4 Dimension 4: technological options

Service innovation is possible without technological innovation, technology is not always a dimension. However, in practise there is a wide range of relationships between 'technology' and 'service innovation'. These vary from technology mainly playing a role as a facilitating or enabling factor, to something much closer to supply-push, technology driven innovation.

While analyzing the three management models as presented above, the main point of consideration in relation to service innovation are:

Balanced service packages & conceptual clarity;

- ✓ Service package in line with the mission, vision and product portfolios.
- ✓ Core service in line with supportive services.
- ✓ Positioning and pricing strategy in line with the former two aspects.

Awareness that delivery processes can be divided in different faces with their own interaction points

- ✓ Design the roles of providers and subcontractors, point attention to every interaction moment.
- ✓ Design and play the role of the user and design interaction moments.

Contributive infrastructure

- ✓ Empower the workforce to act as designed.
- ✓ Competent and skilled providers as well as users.
- ✓ (Social) network building opportunities.

3.10 Organizational features and management practices

How innovation is managed has a great influence on the success of innovation. Managing innovation, in particular service innovation and the understanding of the organizational aspects of innovation in both short term as well as long term perspective is a complex field of inquiry. Complications occurring in relation to an effective organization of innovation are rooted in the paradoxical nature of innovation processes (De Weerd-Nederhof, 2010). Generally innovation activities cannot be described as single events, they often request conflicting organizational demands. As a result of this paradoxical nature, every innovation process has to deal with different management practices.

Another difficulty in relation to the management of service innovation refers to the close relationship with managing chance. Innovation managers experience difficulties in relation to this concept and especially in relation to radical change. What most managers' lack is a habit of thinking about their firm's capabilities as carefully as they think about individual people capabilities (Clayton, Christensen, & Overdorf, 2000). In order to overcome this lack of competence, innovation managers need to be skilled not just in assessing people but also in assessing the abilities and disabilities of their organization as a whole.

Literature on service innovation management has not received widespread attention (Vermeulen & Van der Aa, 2003). With the exception of some authors (Sunbo, 1997; Clayton et al. 2000) most research attempts provide some insights in new service development processes (NSD process). The management of NSD has become an important competitive concern in many service industries. Nevertheless, it remains one of the least studied and implicit topic within service management literature (Menor, Tatikonda, & Sampson, 2002).

The aim of this section is to provide more insight in relation to the organizational features of service innovation processes and some of the management practices that facilitate this type of innovation. We highlight the service innovation process using Figure 10:

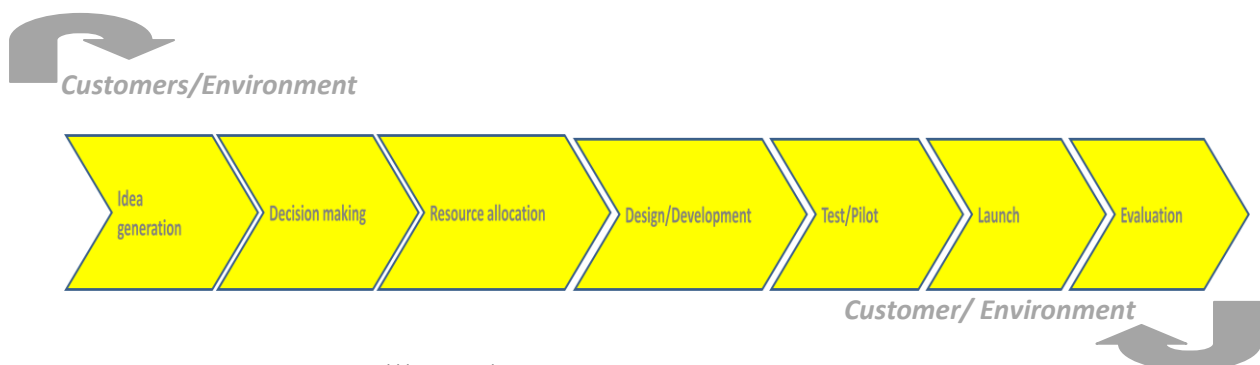


Figure 10: innovation process steps, Flikkema et al. 2010

3.9.3 Innovation Energy

Before we discuss the phases within the innovation trajectory, we first highlight the innovation energy formula of Tidd & Bessant (2009), which describes the basic requirements that should be satisfied by a workforce to become innovative.

Attitude, Behaviours and Structures = Innovation Energy

Attitude

In relation to attitude Tidd & Bessant (2009) are mainly focusing on the role of employees. However, the context is actually broader and refers to all stakeholders the firm is surrounded with. Motivated stakeholders are stakeholders who can make a difference to a firm's innovation profile. In this respect Van Dijk & Van den Ende (2002), highlight the importance of intrinsic motivation. In line with this reasoning, service firms need to convert stakeholders from a "so what" mentality to a "so that is why we are doing this" (Tidd & Bessant, 2009).

Behaviours

"Behaviour beats process every day of the week" (Tidd & Bessant, 2009), the most innovative behaviours occur in case there is room available to try out new things, to build on new ideas through collaboration, to make ideas in the form a customer would buy it, to express disagreement and to navigate between creative and analytical behaviour (Tidd & Bessant, 2009; Hur, 2009).

Structure

The physical environment influences attitude and energy. Firms able to create energizing spaces are able to realize the biggest rewards, trust and openness, challenge and involvement, support and space for ideas, conflict and debate are contributive elements (Tidd & Bessant, 2009).

3.10.1 Phases of the innovation process

Figure 9 provides an overview of the phases within an innovation process and is based on the research of Cooper 2008. Cooper highlights the importance of planning and execution of innovation projects. However, progress in relation to the stages of innovation is rarely linear (Van de Ven et al., 2008 in Dervitsiotis, 2010). Overlapping phases and interaction positively affect performance, particularly in radical innovation trajectories (e.g., Eisenhardt & Tabrizi, 1995; Brown & Eisenhardt, 1997; De Meyer et al., 2002 in Blindenbach-Driessen & Van den Ende, 2006). The underlying idea refers to the fact that it is less useful to plan under conditions of high uncertainty. In these situations, focusing on flexibility and learning through improvisation and experience often result in effective performance (e.g., Eisenhardt & Tabrizi, in press; Miner & Moorman, 1993; Weick, 1993 in Brown & Eisenhardt, 1995).

An essential element in relation to effective innovative performance refers to the central position of the customer within the service innovation process. The customer has always been of high importance due to this co-producer role. However, the actual involvement of customers during the innovation process is steadily growing. Nowadays, customers are often used as an active participant (Michel et al., 2008 in Van der Aa & Den Hertog, 2010) during different phases within the development process.

To summarize, it is almost an illusion to think that the innovation steps as perfectly followed by each other. The defined innovation steps should be mainly viewed as guidelines. Feedback loops, knowledge of customers and anticipation on the environment are necessary within every single step.

3.10.2 Idea generation

Idea generation is closely related to creativity and goes pared with” out of the box thinking”, stepping away from normal or traditional pathways. In relation to idea generating it is important to recognize that creativity is a feature which everyone is capable of however, the way in which people like to express themselves differs greatly (Tidd & Bessant, 2009). One individual might like radical change, while others prefer slight incremental steps.

Idea generation refers to the process in which people know where to look for and why, which in time can be collectively executed (McGuinness, 1990). In accordance to McGuinness (1990) idea generation within organizations is related to three forms. Starting with the individual’s ability to generate ideas which depends on personal perception and initiative. Followed by the ability to find credibility with the organization and Last but not least intensive search in the form of for example organized R&D activities or departments.

Idea generation is possible in several ways, own employees for example are very valuable since they are actually involved within daily procedures and in that sense the first to detect possible gaps. Unfortunately in practice it seems hard to detect these gaps. Conway and McGuinnis (1986) identified several ways to detect ideas; customer driven, market driven planned diversification and opportunistic diversification, close follower and technology driven which are still valid today. *Customer drive ideas* relate to customer knowledge, what type of customer do I serve and what are trends in their behaviour? Furthermore satisfaction rates are valuable information tools, what makes customer satisfied and what are causes of dissatisfaction? *Market driven ideas* occur through to visible market changes, market needs, adaption of strategy etc. *Planned diversification* can be described as a result of ideas generated in line with strategic efforts, with the aim to penetrate new markets and to distinguish from competition. *Opportunistic diversification* is the result of a new concept used to penetrate a new market, although diversification was not a primary intention. *Close follower ideas* are identified by following competition and anticipating on movements and new ideas developed. To end with, *Technology driven ideas* are results of the ongoing technological developments and availability of novel technology also known as technological push.

Customer driven	Market driven	Close follower	Technology driven
Customer knowledge	Planned diversification Opportunistic diversification	Knowledge of competition	Technology push

Toivonen, Tuominen & Brax (2007), identified three types of innovation processes; 1) the model of a *separate planning stage*, also known as the traditional R&D model, 2) the model of *rapid application* (simultaneous planning and production) and 3) the model of *posteriori recognition* of innovation, also known as the practice based model.

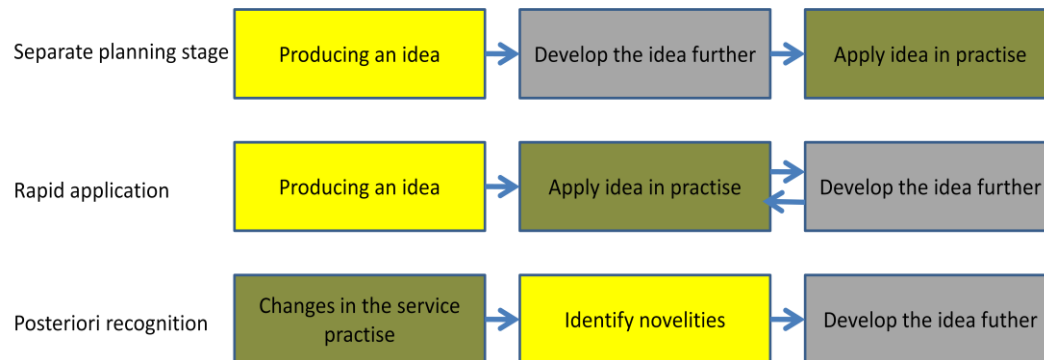


Figure 11 types of innovation processes (Toivonen et al. 2007)

approach to realize innovations. By careful planning in line with firm’s mission and vision the best results should be achieved (Johnson & Scholes, 2002). However, in practice things are different, most service firms in the research of Toivonen, Tuominen & Brax, (2007) used the model of rapid application. The authors identified different reasons for the popular use of this model.

First of all, most service innovation need small amounts of investment, resulting in smaller fear of economic loses. Second, new service development often goes paired with questions that cannot be answered without operating in real markets. A third explanation refers to the urgent need of service in the market and finally if new concepts are delivered in interaction with existing clients, it is natural to continue this development along with operation in the market.

As became clear, ideas emerge from the variety and diversity of experience and behaviours that are to be found across a firm and its surroundings, on all levels (Johnson & Scholes, 2002). Employees for example interpret situations in unique ways and might come up with different ideas for a particular situation since they tap experience from different backgrounds. The greater the variety of experiences, the higher chance on innovation (Johnson & Scholes, 2002).

Furthermore, education is an important element in relation to idea generation. The formation of new ideas and solutions call for knowledge and expertise (Mumford, 2000 in Damanpour & Schneider, 2008). Employees are more likely to use complex and diverse problem solving abilities and decision making if they are educated well (Bantel & Jackson, 1989; Huber et al. 1993; Lee, Wong & Chong, 2005 in Damanpour & Schneider, 2008).

However, not only employees are beneficial, the whole surrounded network is important; changing demands, new partners, new segments etc. are all sources of information and ideas.

3.10.3 Idea selection

3.10.3.1 *Centralization versus Decentralization*

The more centralized a firm, the more likely it is that decisions are made at the top level (Narayanan, 2001). Decentralization on the other hand, often generates higher participation levels of individuals on all levels of the firm in decision-making and thereby more interest in outcomes. This interest in the outcome supports information flows and exchange of ideas, which in turn supports learning and innovation (Narayanan, 2001). Narayan (2001) describes the pros and cons of the two organizational forms which are summarized below.

Through the use of *centralization*, economies of scale and scope can be realized. Furthermore central facilities are more likely to result in good internal communication links. These benefits are not only related to clear communication lines but also include a lower risk of distraction, since centralized innovators are not involved in short term operational problems. Another potential benefit is the reduced risk of competitors copying or leapfrogging ideas in an early statement and with that retain a competitive position. Finally, centralized innovation generates more space to create well established networks with universities, government and other support agencies.

Decentralization on the other hand has the advantage of good external coupling and communication linkages with other organizational functions. Decentralized innovation initiatives are more focused on back office procedures, in particular business and operational units. Decentralized innovation generates more informal communication patterns between innovation teams and other corporate functions. Furthermore, decentralized research centres may enable competitive surveillance in specific localities, especially in overseas locations. By establishing innovation units in selected regions, a firm may be able to tap into governmental aid and incentives. Decentralized innovation may be more responsive to various local market needs.

Some authors argue that developing innovations apart from the rest of the firm leads to undesired side effects, like a reduced share of information (Griffin & Hauser, 1996; Gann & Salter, 2000 in Blindenbach-Driessen & Van den Ende, 2006). This is why Blindenbach-Driessen and Van den Ende (2006) suggest developing innovations in close relation with business activities. However, in these cases, different managerial procedures need to be applied.

3.10.3.2 *Selection systems*

The survive of an idea depends on the selection mechanisms used by a firm. Selection systems take different forms. In relation to strategic position, the market is a key selection mechanism (Johnson & Scholes, 2002). Strategies develop and prosper in close cooperation with the market, not only from financial perspective but also in accordance to personal preference of customers (e.g. Cooper & De Brentani, 1991; Gounaris, Papastathopoulou, & Avalonitis, 2003 in Flikkema, 2008) and understanding of competitor strategies and offerings (Cooper & De Brentanti, 1991 in Flikkema, 2008) are essential. Service innovation projects that feature strong market orientation and high quality of

execution of marketing activities on all levels of innovativeness are considerably more successful (Johnson & Scholes, 2002).

At the strategic action level, selection mechanisms refer to planning, budget and evaluation issues (Johnson & Scholes, 2002). At the level of strategic choices, selections are often based on the attractiveness of an idea (Johnson & Scholes, 2002). These reasons could be rational, analytical demonstrated or due to more subjective reasons. However, it is unlikely that brand new ideas gain prevalent support from the start. In these cases it is important to gain initial support from for example a manager acting as a champion of the potential innovation.

Idea Generation	Decision Making
<p>Internal & External stakeholders</p> <p style="text-align: center;">↓</p> <p>Variety and diversity of experiences and behaviours.</p> <p style="text-align: center;">↑</p> <p>Training & Education</p>	<p>Centralization</p> <p>Economy of scale High internal communication links Lower risk of distraction Reduced risk of copying High amount of space to create network opportunities</p> <p>Decentralization</p> <p>Focus on Back Office activities High communication links with other organizational functions and teams Competitive surveillance in specific locations (especially overseas) Establishment of innovation unit anticipating on local market needs</p> <p>Selection systems</p> <p>Market, financial & preference of customers Competitors, strategies & offerings Strategy, planning, budget, evaluation, Attractiveness, analytical demonstrated or subjective Champions, support for potential</p>

3.10.4 Resource mobilization

Resource mobilization mainly concentrates on the financial sources available (Flikkema, 2008). Financial resources consist partly on innovation budgets as present on the firms' budget plan. A second source of innovation budget is realized through the government, on local, national as well as European levels. The Government is an important provider of grants for innovation activities. Regrettably, most innovation grants within the Netherlands are provided to technological projects (CBS, CIS results 2004-2006). Third important resources are customers. Especially in a business to business environment customers are likely to provide financial resources when necessary. In a business to consumer environment financial resources are paid in kind, mostly in the form of time invested in the innovation.

3.10.5 Resource allocation

Eisenhardt & Brown (1995) developed an integrative model of product development from which components are suitable for service innovation as well. The main logics behind the model refer to, process performance, product affectivity and financial success.

Process performance relates to the ability of a firm to design an effective project team, guided by a strong leader, gaining high support of senior management and connected to customers and suppliers. Process performance is dependent on the amount, variety, problem-solving ability and accessibility of information and resources available (e.g., Brown & Eisenhardt, 1995; Dix, 1993; Kaplan & Norton, 1993; Katzenbach & Smith, 1994 in Plaisier, 2010).

Product effectiveness relates to the fit of the innovation with both firm competences as well as customer needs. Product effectiveness is a result of a well defined vision, extensive use of suppliers and customer who decline the complexity of an innovation process with their insights, resulting in faster and productive development processes and early identifications of problems (Brown & Eisenhardt, 1995).

Finally financial success highly depends on the right fit between process, designed innovation and actual market shape (Brown & Eisenhardt, 1995).

Resource Mobilization & Allocation	Design/ Development
Financial mobilization sources Intern Budget plan Extra funding Extern Governmental grants (local, national, European) External parties Allocation Design of a project team (Multidisciplinair, senior management support, strong leader, connected to customers and suppliers) Clear vision Design of product /service Fit between firm capabilities and customer needs Clear vision Extensive use of suppliers and customers Right fit between process, design and market shape	Development of a business case Commercial feasibility Technical feasibility Project team Transfer ideas into designs Are responsible for speed and quality

3.10.6 Design and development

During the design and development stage, commercial and technical feasibility of the innovation need to be investigated, most of the time these investigations are summarized in a business case (Ernst, 2002). The outcomes of the business case create useful insights for decision making (Ernst, 2002).

Project team members are the people who transform vague ideas, concepts and product or service specifications into the design of new products or services. Composition, group process, and work organization of the project team affect the information streams, available resources and problem-solving style of the team. These ultimately influence the speed and quality of the innovation process (Brown & Eisenhardt, 1995).

Although team performance is not a main area of research, it is an essential step in the management process of service innovation. In order to highlight the most important key elements I embroider on the work of Flikkema (2008) and Plaisier (2010).

Team diversity is necessary, differentiated members, share other opinions, they refer to other situations and experiences from different backgrounds (personality, culture, gender, goals etc.) (Chang, 1995; Johnson & Scholes, 2002).

In order to design a well operating team, team basics as defined by Katzenbach & Smith (1994) require careful considerations (Plaisier, 2010). These basics are: size, there is a direct correlation between team size, individual and group performance (Amelsvoort & Scholtes, 1994 in Plaisier, 2010). A team consisting of seven till twelve persons with different backgrounds is most optimal (Katzenbach & Smith, 1993; Amelsvoort & Scholtes, 1994 in Plaisier, 2010). Skills and competences, team role diversity should be available in relation to skills as well as social emotional roles (Forsyth, 1990 in Plaisier, 2010). Complementary skills e.g., technical or functional expertise, problem solving ability (Katzenbach & Smith, 1993 in Plaisier, 2010), cultural differences (Hofstede, 1995) and psychologic boundaries (Hirschhorn & Gilmore, 1992 in Plaisier, 2010). Goals setting, all these required differences should meet each other on the level of goal setting. Without goal congruence it is impossible to complete a task successfully. Team approach and accountability, in order to perform their tasks well, team members should communicate with each other on a frequent basis and should be easy accessible to each other. Communications include formal as well as informal communications on both face to face as well as interactive communication lines (Van Amelsfoort en Scholtes, 1994 in Plaisier, 2010).

3.10.7 Testing/ Evaluation

Before a service is available on the market it is advised to design a test phase (Kotler & Keller, 2007). Testing involves presenting the designed service innovation to a couple of customers in the pre developed target market and to evaluate their experiences. Service innovation can be tested both symbolically as well as physically. Nowadays it is also possible to make computer based service designs through the use of virtual reality (Kotler & Keller, 2007).

Service firms need to evaluate the proposed new innovation on defined targets like sales forecasts, costs, profit projections etc. if these projections satisfy the innovation's objectives, the innovation is ready for the market launch.

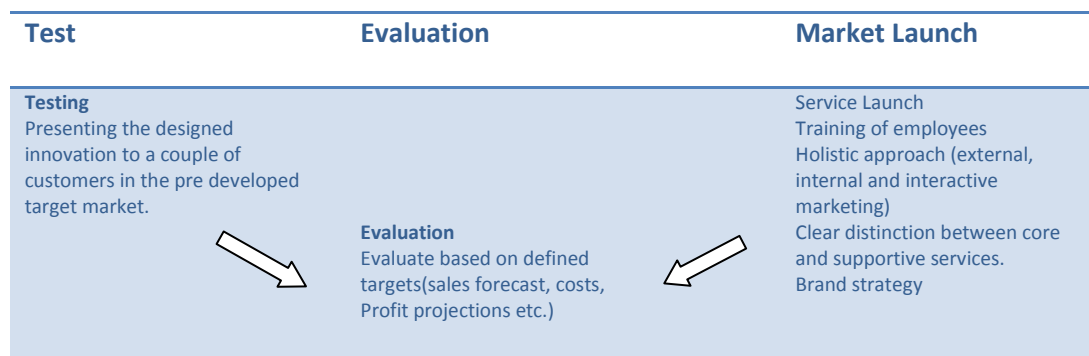
The management of service quality is a never ending process. Service firms need to be aware of the effects of every service encounter. Strategic concept, overall commitment to quality, high service standards, systems for monitoring service performance and customer complaints, and an emphasis on customer and employee satisfaction are necessary requirements (Edvardsson, Thomasson, & Ovretveit, 1994; Kotler & Keller, 2007). If one of these concepts is lying behind, it is time for innovative solutions.

3.10.8 Service launch

As shown by a number of authors (e.g. Cooper et al. 1994; Edgett, 1994; De Brentani, 2001; Gounaris et al., 2003 in Flikkema, 2008) the actual launch stage of the service innovation is of great importance. Training of service employees and internal marketing of the innovation are important management responsibilities in order to successfully launch the innovation (e.g. Gronroos, 2000; Tidd & Bessant, 2009).

During the service launch, multiple actors take part in often complex processes. That is why a holistic marketing approach is necessary. Holistic marketing requires external, internal and interactive marketing (Kotler & Keller, 2007). External marketing refers to the more traditional marketing elements like, pricing, distribution channels, advertisement campaigns etc. Internal and interactive marketing are explicitly essential in service firms and are highly related to customer contact. Training and motivating service employees to service customer in an appropriate way is essential, every service employee acts as a part-time marketers in the service delivery process and should be properly skilled(Gronroos, 2000; Kotler & Keller, 2007). Furthermore it is essential to differentiate, through a clear distinction between core and supportive services (Edvardsson, 1997; Kotler & Keller, 2007; Frei, 2008), and the development of appropriate brand strategies, which may include different labels under one corporate umbrella (Frei, 2008).

Finally it is valuable to notice that services outcomes consist of intangible elements, it is difficult for (potential) customers to assess the potential benefits of a service innovation before they actually experience it. Therefore marketing is of great importance to service firms. In order to market their services and product, service firms have to decide what kind of umbrella they require, for example *branding by strategies*; the Accor Hotel group, different brands for each price category, Formule 1 relatively cheap in comparison with Sofitel. The formation of *an umbrella brand, with different brands per business activity*; the EasyGroup, easyjet, easyhotel, easypizza etc. or the use of *Sub brands under a major brand*; Center Parcs as sub brand of Pierre Vacances.



To conclude, shaping and managing innovation processes can be described as a complex adventure, which resulted in the popular metaphor of an “innovation journey” (Van de Ven et al., 2008; De Weerd-Nederhof, 2010). Although there are some principles available as presented in this section, the application is only a tool for successful innovation and no guarantee, since it is all a matter of balancing the service strategy with the (operational) environment.

4 Methodology

This chapter describes the research methodology applied in this study. As suggested in Baarda and de Goede (2001), extra attention is paid to the design, variable measurement and the data collection process. This service innovation study is a descriptive study using cross-sectional data and digital survey methodology to describe the relationship between management characteristics, firm’s characteristics and service characteristics within Dutch service firms in the period 2008-2010.

4.1 Research design

Sample size; the sample of this research contains data on 80 service innovation initiatives. 46 service firms completed all the questions.

Study scope; this service innovation study is innovation type based in scope. The units of analysis in this study are the new service innovation realized and the characteristics of the service firm.

Level of data collection; In this study Respondents were specified as “managers responsible or closely involved in the development and marketing of service innovations”. I applied a single-respondent approach. We made the choice of not specifying the level of data collection in advance since most service firms have difficulties in selecting “the main person” responsible for innovation by job title only. Innovation responsibilities differ from innovation, business development to sales, marketing etc. Furthermore, knowledgeable respondents were more important to me than respondents of a certain organizational level.

Performance perspective; A success approach is used in this study. This means that respondents were asked to assess a successful innovation.

Service industries studied; The main point of reference is the Dutch service industry. The objective is to create an a-typical sample, representative for service firms active on the Dutch market.

Region of study; The focus is on the Dutch service industry, though there are service firms in the research population with a multinational scope.

Types of innovation; four types of innovation were studied, i.e., process innovation, product innovation, recombinatorial innovation and marketing innovation.

Figure 4 captures the characteristics of the research design.

Size	Scope	Level of Data collection	Performance perspective	Industry studied	Region	Type of innovation
80	Innovation type	Managers responsible or Closely related to innovation	Successful innovation	Service industry	Netherlands	Process Product Recombinatorial Marketing

4.2 Measurements

In order to attain an answer to the main research question and to operationalize the concepts, as presented during the theoretical section of this report, a web survey has been used. Literature shows that web surveys are a suitable method to find answers on “what” questions (Yin, 1994 in Flikkema, 2008). Most of the survey questions are assessed on a 5 point Likert Scale and programmed in the web-survey programme Survey monkey (advised during the master class service management, 2009).

The survey results are analyzed using the following tests; descriptive, crosstabs, chi-square analysis, Kruksal Wallis tests, Mann Withney tests, ANOVA and one sample T-tests. The justifications for these tests are presented in the Depth analysis section.

4.3 Pre-testing the web survey

Construct validity refers to the degree to which inferences can legitimately be made from the operationalizations in a study to the theoretical constructs on which the operationalizations are based. The following steps have been made to design measurements which are good representatives of concepts in this research.

First, the expert validity are checked. Besides primary internal advisors, two academic experts on service management were closely involved in order to validate the operationalization of the constructs from the research model.

Second, three intended respondents of the questionnaire with at least a drs or master degree, one from a financial service firm, one from a consultancy service firm and one from a innovation service firm were invited to test the questionnaire and to validate the operationalizations of the constructs during a personal test and interview meeting. All of them accepted this interview. During the interview meetings, survey items not validated during earlier studies received explicit attention. At the start of the interview meeting test persons are asked to fill out the questionnaire while immediately expressing their thoughts loudly. This way of working was designed in order to reduce ambiguity and complexity of the web survey, to improve instructions, to optimize the routing and to tune the lay-out.

Thirdly, after the personal interviews and processing of the results, the web survey has been discussed again with the supervisor committee. Finally the survey is additionally by prof. dr. A.P. de Man of the VU in Amsterdam.

4.4 Data collection and sampling

The data collection of this study took part using different strategies. First all we made a list in order to get a A-typical research pool, contributive to possible generalization. During our journey to get the right email addresses we found out that it is a really tough job to collect these. One of the major prejudice risks is the receptionist at the telephone central of a service firm. Most receptionist experience difficulties in selecting the main person responsible for innovation. This might be an innovation manager, sales manager, business development manager, marketing manager etc. Besides, a lot of receptionists are instructed to not disturb these high organizational level employees and to keep their email addresses as private as possible. Although we had some successes while referring to

the importance of the research and by naming all universities involved in this research the collection process went very slow.

We tried to overcome these problems by contacting different service industry organizations, however we received only some small successes. First of all, Koninklijke Horeca Nederland (KHN) was very enthusiastic about this research, but unfortunately in their opinion the research was not suitable enough for small firms, which is 80% of their member organizations database. KHN forwarded my request to het Bedrijfschap Horeca en Catering unfortunately, they shared the same opinion. Second we were in contact with the Algemene Nederlandse Vereniging van Reisondernemingen (ANVR), regrettably these organizations were working on a research already by themselves and willing but currently unable (risk of overloading) to send my questionnaire.

We received some success as well, the Vereniging van Nederlandse Recreatie Ondernemers Nederland (RECRON) was willing to help us and published a research link in their digital newsletter. Also within the innovation industry organizations, we received more success. First of all SYNTENS (A Dutch network for innovations within small and medium sized firms) was willing to put a link form the web survey on their website. Secondly NOVAY (Dutch networked innovation) was willing to send my questionnaire directly to a batch of 300-400 innovation managers, which was really contributive. Finally the industry organization Uneto VNI (Dutch installation and technical retail trade services), was prepared to sent my web survey to a batch of their database as well.

Sampling strategy Due to the fact that we made use of member lists of industry organizations, the sampling strategy has to be qualified as a selective sampling. The point that we generated data through two organizations directly related to innovation might explain possible variance in the data. However, this cannot be checked with the data, although we intuitively believe that this is a most likely scenario. Finally service quality and firm size might discriminate between the data since SYNTENS concentrates on medium and mall sized firms.

5 Data analysis

This chapter reports the results of the data analysis. First of all respondent characteristics are described, followed by descriptive statistics of the web survey results. Finally, results of the analysis in consistence with the research question *“How do the management of innovation in service firms, service characteristics and firm characteristics relate”?* Are presented. We analyzed the data on the following levels; 1) management capabilities, 2) service characteristics and 3) firm characteristics.

5.1 Respondents

In total 1282 respondents were directly approached to fill in the web survey, supplemented with the actions of sector organisations. These actions resulted in 80 respondents who started the web survey. At first site, this seems a response percentage of 6, 2%. Unfortunately, while analyzing the data we found that only 46 respondents actually finished the web survey in total, which decreases the response rate from 6, 2% till 3, and 6%. Since the respondents dropped out at different positions, or restarted later, the N’s in the descriptive section are given per question.

5.1.1 Demographics and response

The format from Van Riel et al. (2004) is used to describe the demographics. In total 80 respondents were willing to fill out the web survey. Unfortunately, 46 respondents completed the whole survey.

Industry	Participants		Firm Size	Participants		Occupation	Participants	
		%			%			%
Wholesale and retail	1	1,25	1 to 10	14	17,8	General Manager	24	30,0
Transport and storage	2	2,50	10 to 50	14	17,8	Business Unit Manager	5	6,3
Hotels, campgrounds and restaurants	1	1,25	50 to 100	11	14,0	Marketing Manager	5	6,3
Information and communication	3	3,75	100 to 500	15	19,0	Research & Development Manager	5	6,3
Telecommunication	3	3,75	500 to 2000	9	11,2	Sales Manager	3	3,8
IT services	10	12,50	>2000	16	20,2	Product Manager	2	2,5
Financial activities and insurance	12	15,00				Business Development Manager	13	16,3
Advertising, marketing research and consulting	2	2,50				Operations Manager	2	2,5
Administrative and support services	5	6,25				Anders/other	17	21,3
Employment, employment agencies and personnel management	5	6,25						
Beveiliging en opsporing	1	1,25						
Other services	13	16,25						

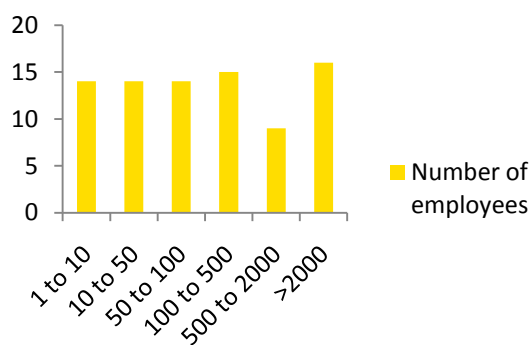
Education	8	10,00					
Health and welfare	2	2,50					
Arts, entertainment and recreation	2	2,50					
Other sectors	6	7,50					
Valid	76	95,00	79			76	95,0
Missing	4	5,00	3			4	5,0
Total	80	100%	80	100%		80	100%

Most respondents are active within financial activities and insurance (15%), IT services (13%), Education (10%) or other non defined service industries (24%). The firms size categories are relatively equally defined. Respondents are mainly general manager (30%) followed by business development manager (16%). The “other” sector is also relatively high (21%) and contains all high level management functions which are described in detail within the description section of this report.

5.2 Descriptive statistics

Firm size

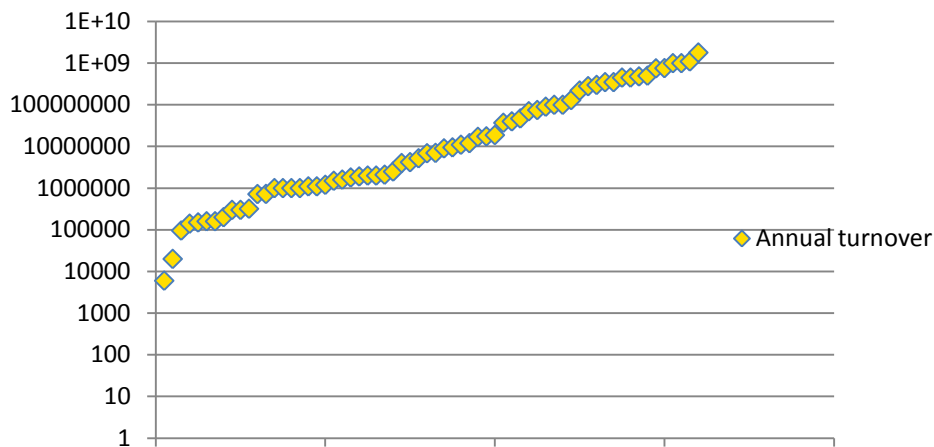
N Valid 79 Missing 1



Within an ideal situation, numbers of employee categories in the survey are equal to the categories used by “Centraal bureau voor de statistiek”, a Dutch organization responsible for the statistics of the Dutch economy. Regrettably, the number of employee categories is too large for the sample. In order to create a better representation of the values, the numbers of employee categories are minimized and the values recoded. Based on the Figure as presented above, it becomes visible that the firm size categories are relatively equally divided although, they do not represent reality since 90% of the service firms are small or medium sized firms in the total economy(CBS, 2009).

Annual turnover

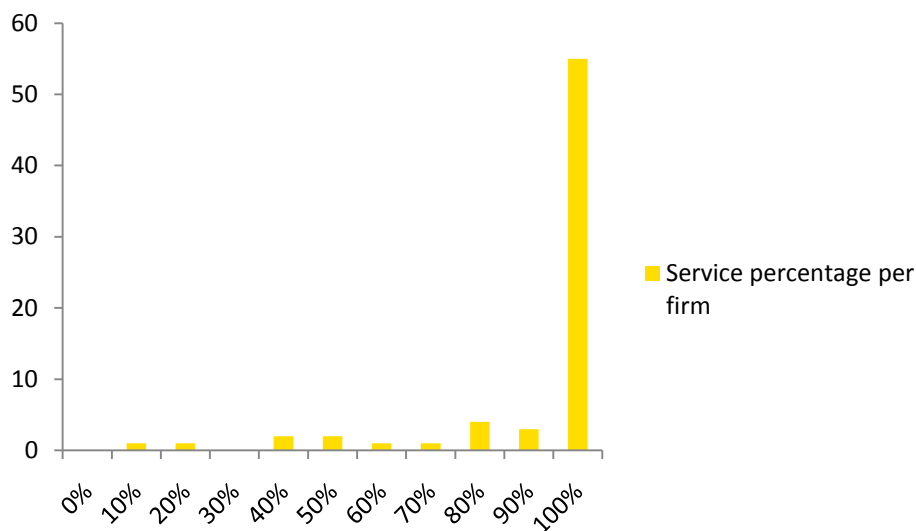
N Valid 64	Skewness 2,819	Kurtosis 8,983	
Missing 16	Mean €166,049,634	SD €338,881,113,-	Mode €1,000,000



The annual turnover ranges from €6, 000, - to €1, 800, 000, 000,-. Not all respondents were willing to answer this question. 16 respondents did not answer this question. The mean annual turnover was €166, 049, 634, - while the mode is positioned at €1, 000, 000,-. The logarithmic distribution is fairly linear.

Service percentage annual turnover

N Valid 70	Skewness -2,703	Kurtosis 6,94	
Missing 10	Mean 91,76%	SD 19,495	Mode 100%



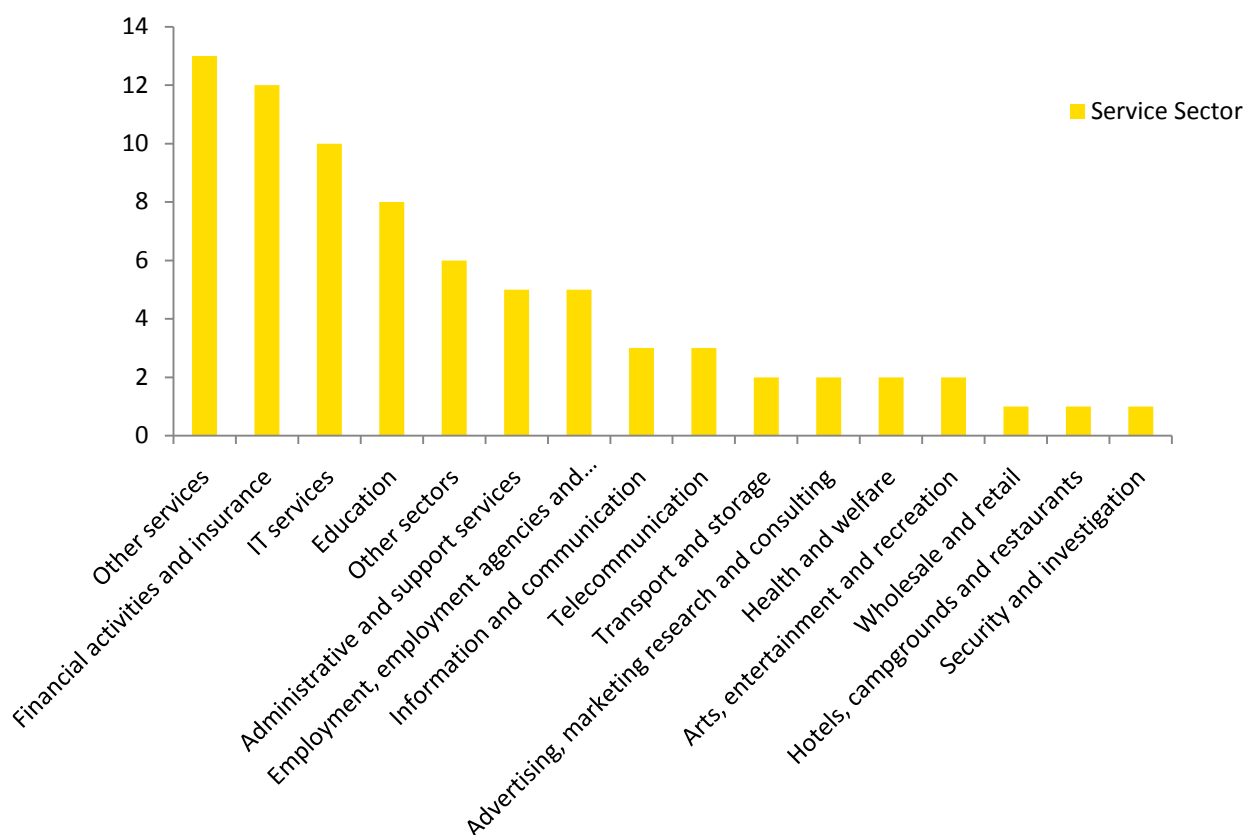
Service percentages of annual turnovers range from 10% till 100%. The mean service percentage is 91, 76 % mode 100%. Most of the respondents are employed in a 100% service firm. Six firms are positioned in the range with less than 50% services, although these firms have some service elements in their operational activities, they cannot be characterized as real service firms.

Service Sector

N Valid 76

Missing 4

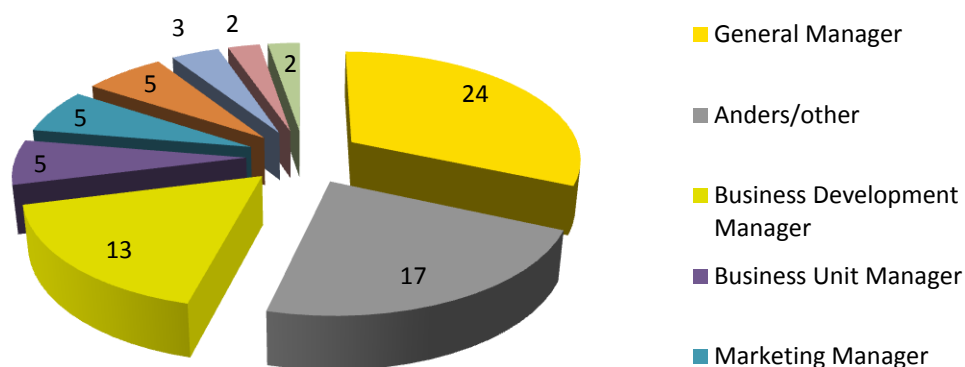
Mode other services



In order to indicate the service sector in which respondents participate, codes used by the Dutch "Centraal Plan Bureau" (CPB) were used. Unfortunately 19 respondents (25% of the sample) were not able to categorise their firm in one of the sectors and chose the option other service or other sector. Furthermore it is visible that financial activities and insurance, IT services, and education are large service groups within this sample. Together these firms represent 40% of the sample. The following sectors did not respond to the survey; repair of vehicles and motorcycles, publishers, film video radio and TV, exploitation and trade in real estate, rent and lease, travel agents and tour operators, facility management cleaning and landscape care and public administration.

Profession of respondent

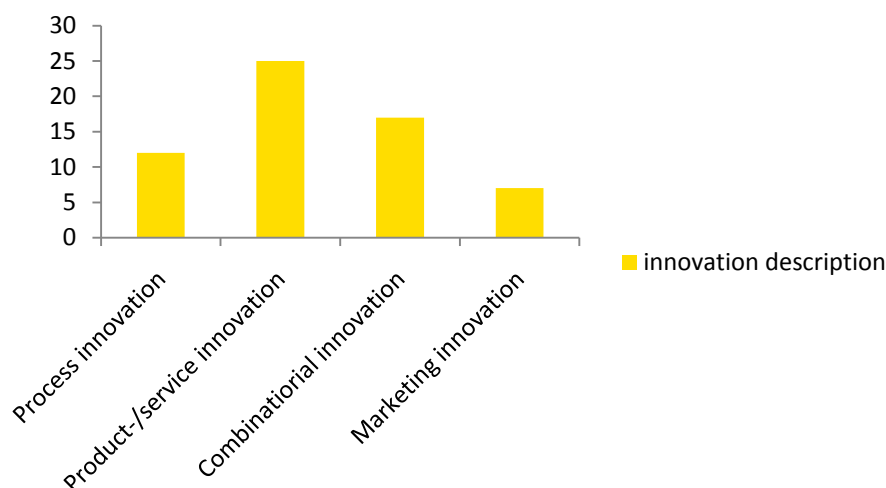
N Valid 76 Missing 4 Mode General Manager



Most of the respondents are General Managers (Mode); furthermore the business development manager representation is large. The respondents that answered “Other” have the following professions: Innovation, Sector Manager Business service, strategy manager, director strategy & development, director marketing & sales, ICT manager, Innovation manager, general director, service design consultant, manager, business developer, senior project manager, owner, relation manager, recruitment manager, office manager and quality manager.

Innovation type description

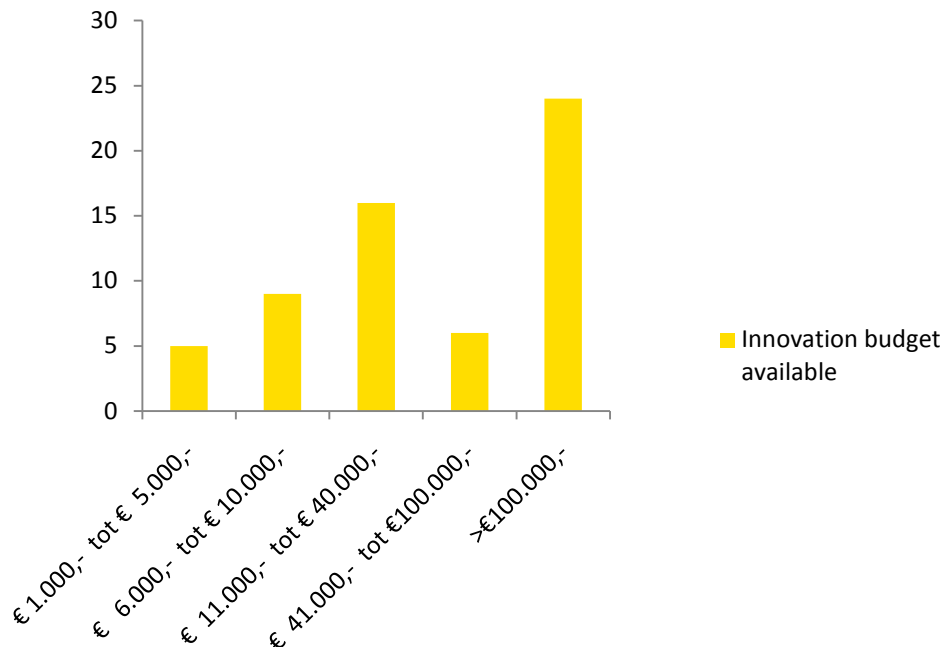
N Valid 61 Missing 16 Modus product/service innovation



The product/service innovation description is mostly indicated as the best suitable innovation description, followed by recombinatorial innovation, process innovation and marketing innovation. 69% of the respondents are busy with authentic product or service innovations.

Innovation budget assigned

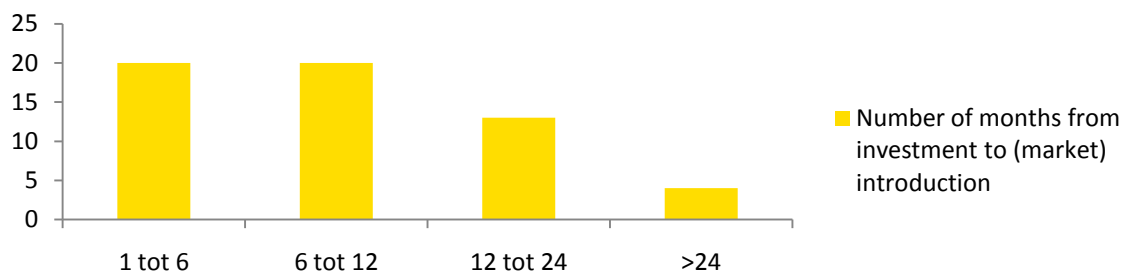
N Valid 60	Missing 20	Median 3,5	Mode 5
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Most firms (24 out of 60) assigned more than €100.000,- (category 5) in order to develop and introduce their chosen innovative activity. The mode is situated at 3, 5 and located between €11, 000,- and €100, 000,-.

Number of months from investment to (market) introduction.

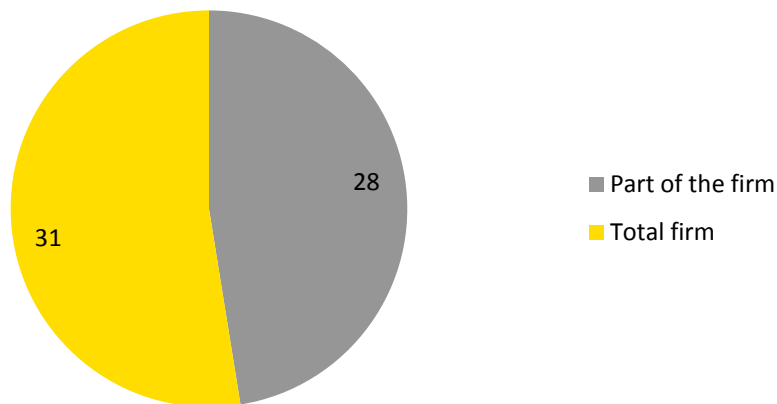
N Valid 57	Skewness 3,113	Kurtosis 12,139
Missing 23	Mean 13,75	SD 13,017
		Mode 6



The number of months firms used to develop their innovation from investment decision till market introduction varies between 1 and 76 months. In order to get a better overview of months necessary I recoded the data in four categories as presented in the Table above. Most firms realized their innovation within a year. The original mode is positioned at 6 months, the original mean is positioned at 13, 75 months.

Innovation responsibility

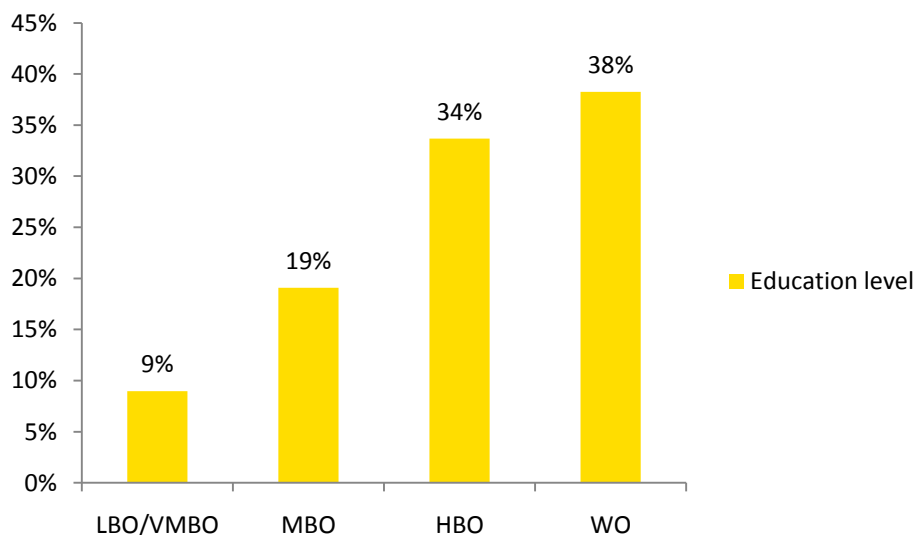
N Valid 59	Missing 21	Mean 1,53	Mode 2
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Based on the Figure above, there are no real differences between the responsibilities for the innovation process. The responsibility covering is more or less equally divided. Half of the time it is part of the firm's responsibility and the other half it is a total firm's responsibility.

Education level

N Valid 57	Missing 23		
LBO/VMBO	MBO	HBO	WO
9%	19%	34%	38%

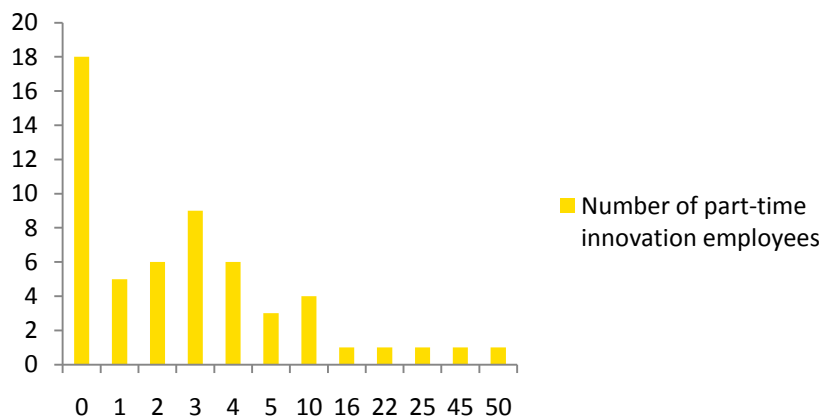


One of the survey questions concentrated on the education level of service firm employees. While taking the main score of all answers categories (LBO/MBO/HBO and WO), 38% received higher education, a scientific degree, 34% higher vocational education, 19% intermediate vocational education and 9% lower vocational education or lower

secondary professional education. 72% of the service employees within this sample received a higher degree.

Part-time innovation employees

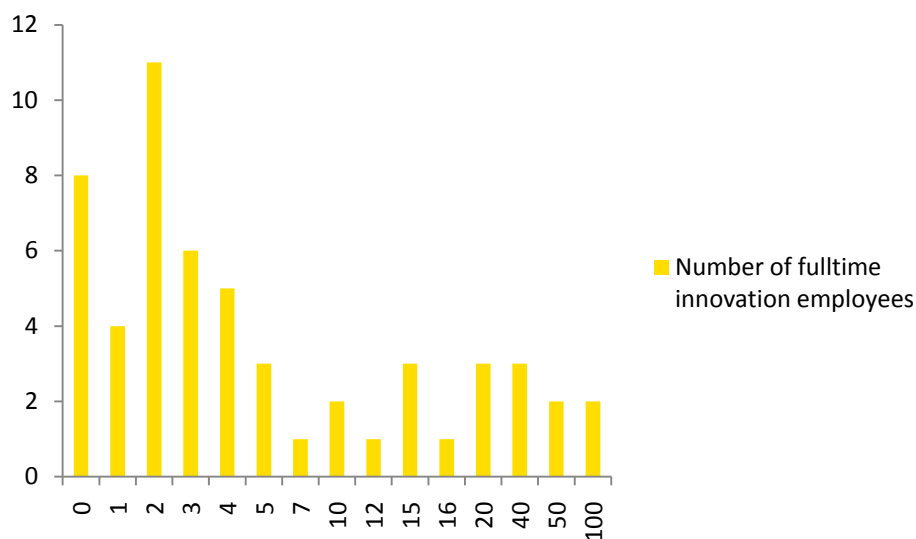
N Valid 56	Missing 23	Mean 5,02	Mode 0
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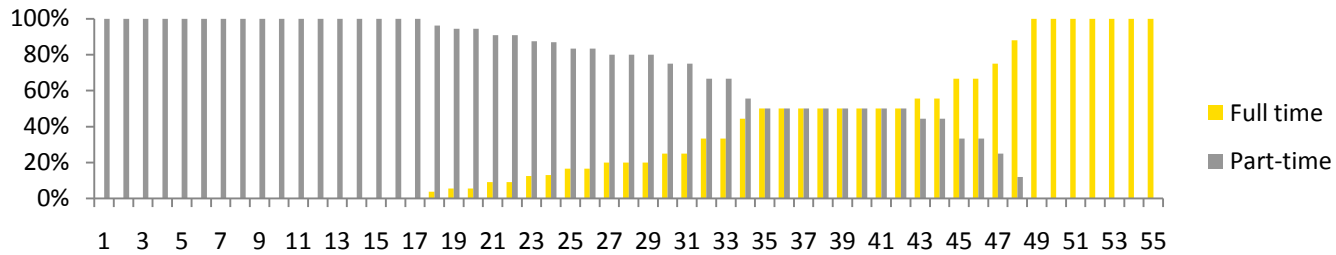
The number of part-time innovation employees varies from 0-50. Most service firms within this sample did not assign part-time innovation employees, mode is 0. On average 5 employees are assigned to a part-time innovation occupation.

Fulltime innovation employees

N Valid 55	Missing 25	Mean 12	Mode 2
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Fulltime employee involvement originally ranges from 0 to 40,000 employees. The mean is positioned at 7154 employees, while the mode was situated at two employees. This difference is caused by the extreme outlier on at the right assigning 40,000 full time employees. While removing this extreme outlier it becomes visible that the average number of full time employees is positioned at 12 employees, while the mode is positioned at 2.

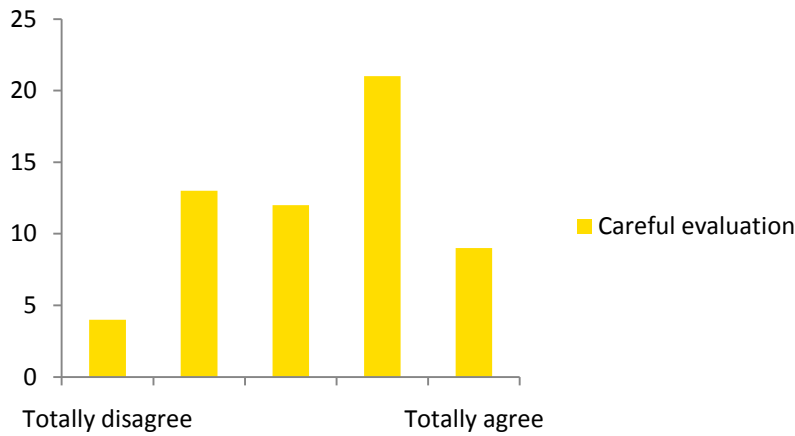


Overall, on average 24% of all employees are assigned to innovation activities on a full time basis, while 62% are assigned on a part-time basis.

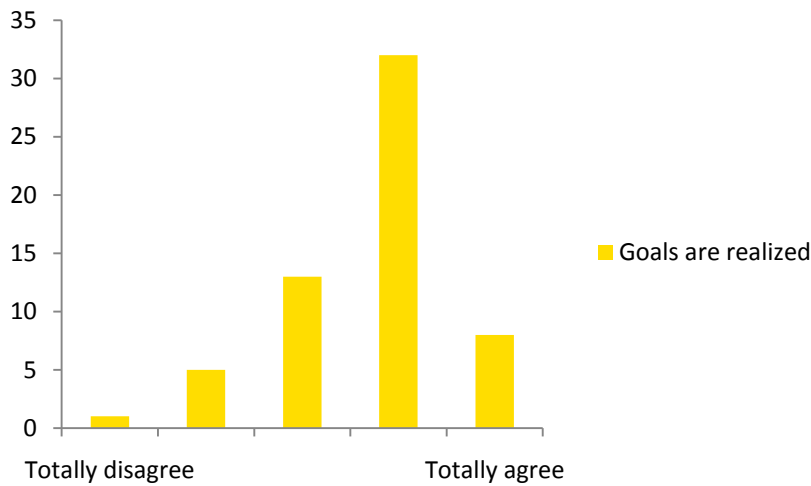
Evaluation criteria

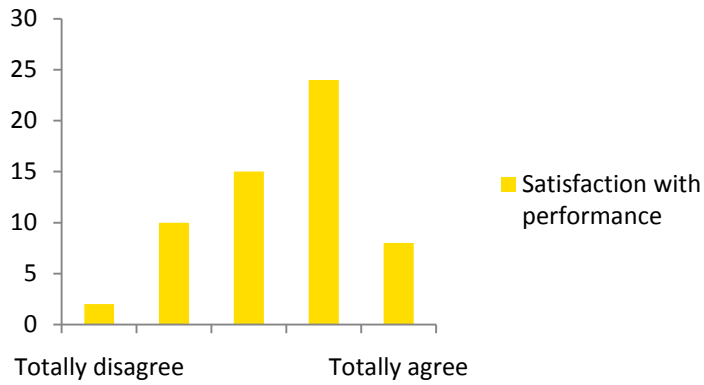
N Valid 59 Missing 21 Item score 1 totally disagree to 5 totally agree

Mode 4

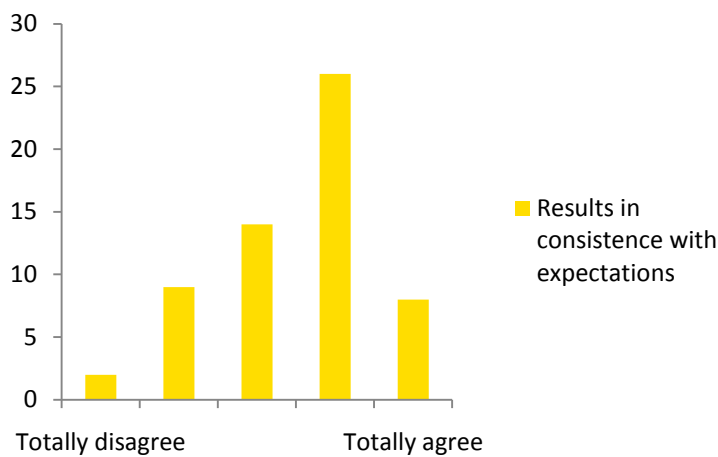


Mode 4





Mode 4

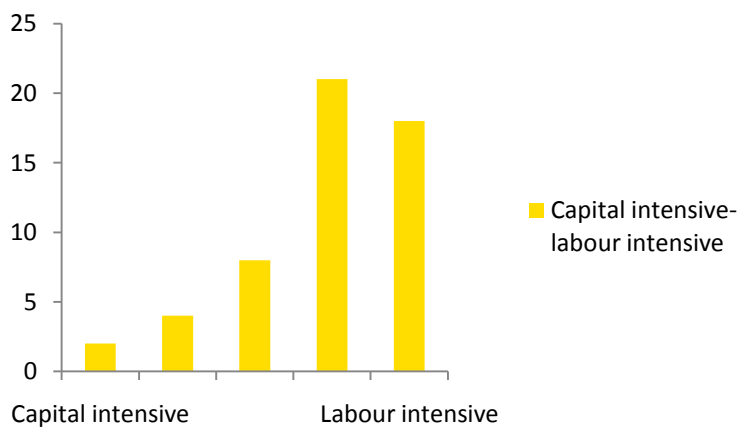


Mode 4

At first sight the evaluation criteria are comparable. All the evaluation items received a modus score of 4 (representing at least 30% of the sample) which is at the high end.

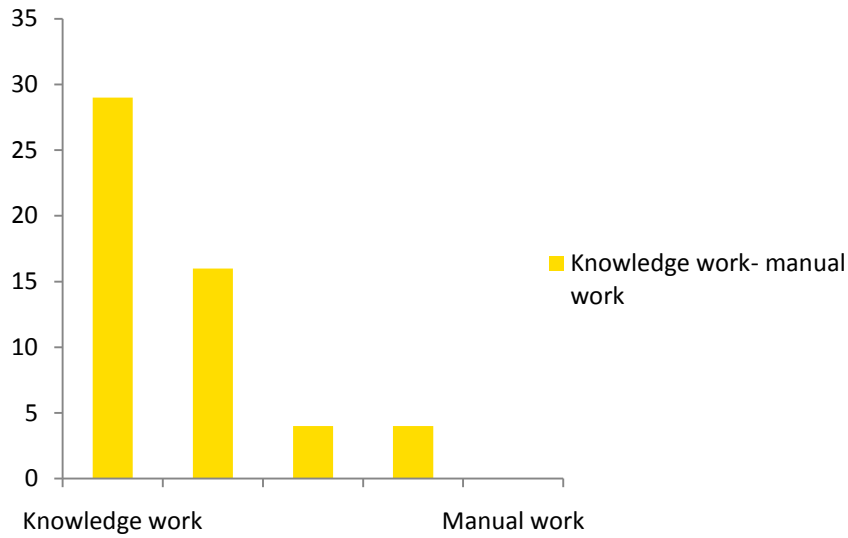
Item score 1 -5 as presented in the legend

Service characteristics

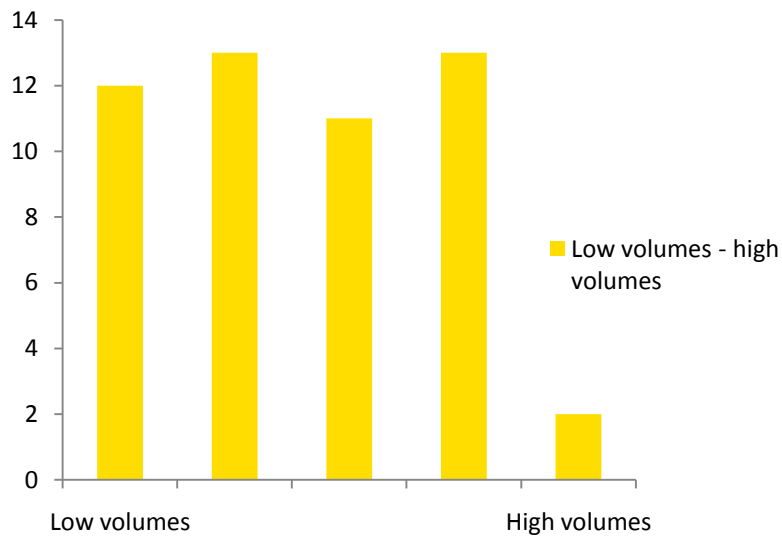


N 54 Mode 4

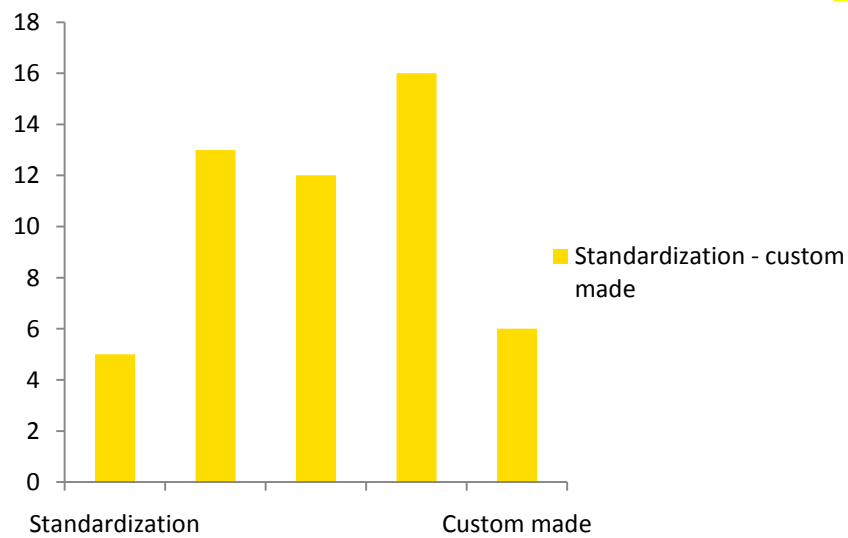
N 53 Mode 1

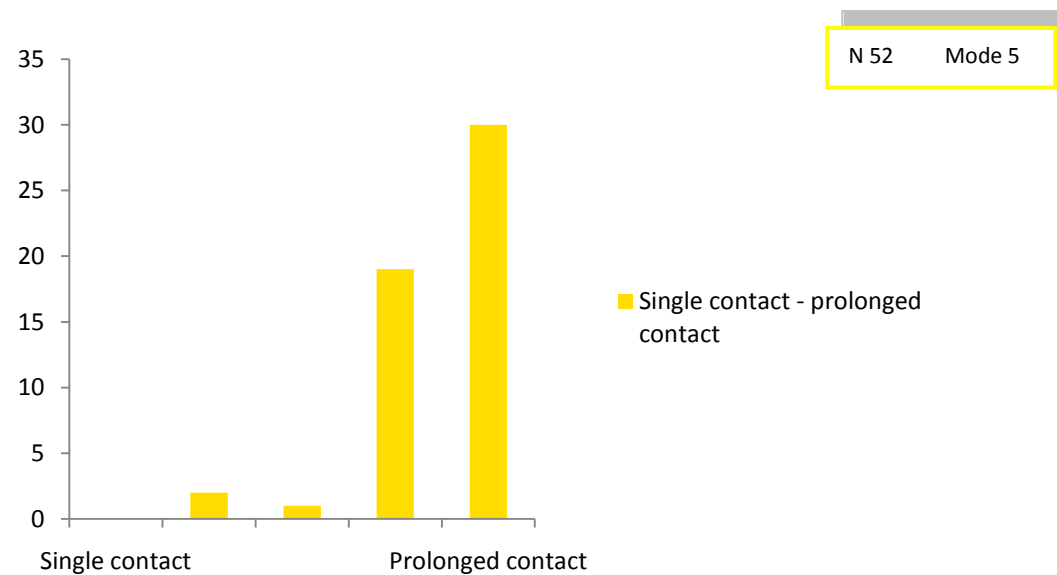
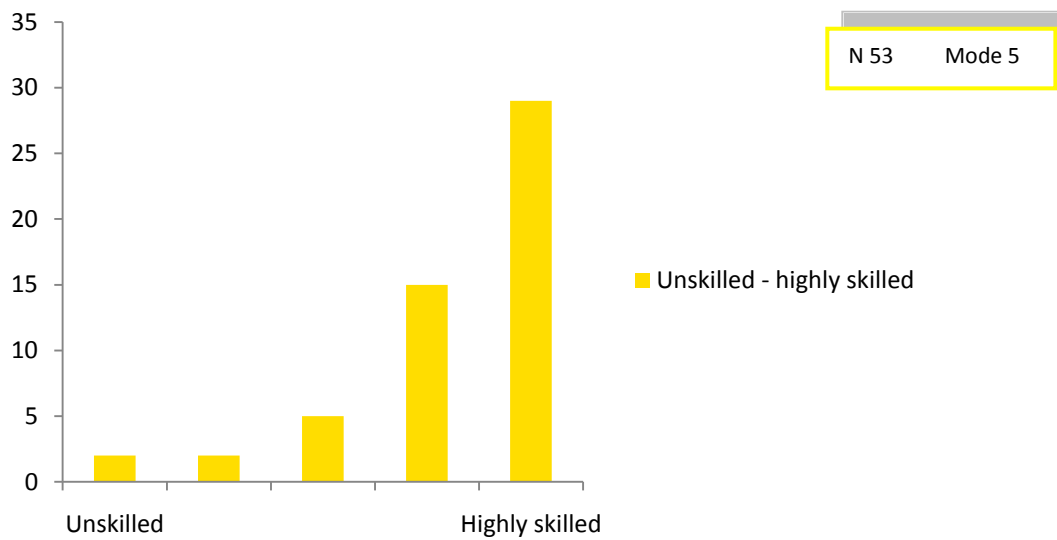
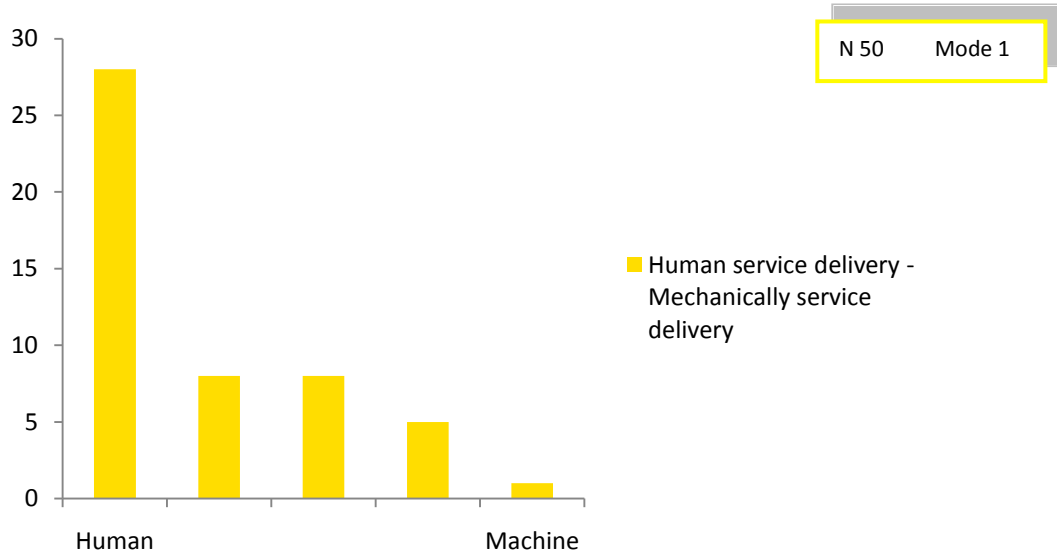


N 51 Mode 2/4



N 52 Mode 4





The services delivered by firms within this sample can be roughly characterized as knowledge intensive, mediate volumes, standardized with custom made elements, delivered by highly skilled humans resulting in prolonged relationships with customers.

In this stage of the research it is already interesting to zoom in on this data a little bit more. I mirrored the four service types with the service characteristics defined and recoded the data into three answer options instead of five. Zooming in on the data, the following Figures and descriptions can be presented.

Professional services

Professional services characteristics			
Capital intensive	<>	Labour intensive	Total
1	1	19	21
Knowledge work	<>	Hand work	Total
19	1	1	21
Low volumes	<>	High volumes	Total
13	3	3	19
Standardization	<>	Custom made	Total
3	4	13	20
Service delivered by humans	<>	Service delivered by machines	Total
16	4	0	20
Low skilled	<>	Highly skilled	Total
0	1	20	21
Single customer contact	<>	Permanent contact with customers	Total
2	0	19	21

Based on this Figure, Professional service firms are characterized by labour intensive services, knowledge work, low volumes, custom made products delivered by highly skilled humans during long-term customer contacts.

Installation services

Installation service firm characteristics			
Capital intensive		Labour intensive	Total
		8	8
Knowledge work		Hand work	Total
6	2		8
Low volumes		High volumes	Total
4	2	2	8
Standardization		Custom made	Total
0	4	4	8
Service delivered by humans		Service delivered by machines	Total
8	0	0	8
Low skilled		Highly skilled	Total
0	3	5	8
Single customer contact		Permanent contact with customers	Total

0	0	8	8
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Installation service firms are characterized by labour intensive services, knowledge work, low volumes, custom made service, delivered by highly skilled humans during long term customer contacts.

Mass services

Mass service characteristics			
Capital intensive		Labour intensive	Total
2		3	5
Knowledge work		Hand work	Total
4	1		5
Low volumes		High volumes	Total
1	2	2	5
Standardization		Custom made	Total
4	0	1	5
Service delivered by humans		Service delivered by machines	Total
3	0	1	4
Low skilled		Highly skilled	Total
2	0	3	5
Single customer contact		Permanent contact with customers	Total
0	0	5	5

Mass services are characterized by a combination of capital and labour intensive service activities. All mass services are knowledge intensive. Although most services are standardized, services are delivered both in high as well as low volume batches. Mass services are delivered by both humans and machines requiring low as well as highly skilled employees. Customer relations are characterized by permanent relations.

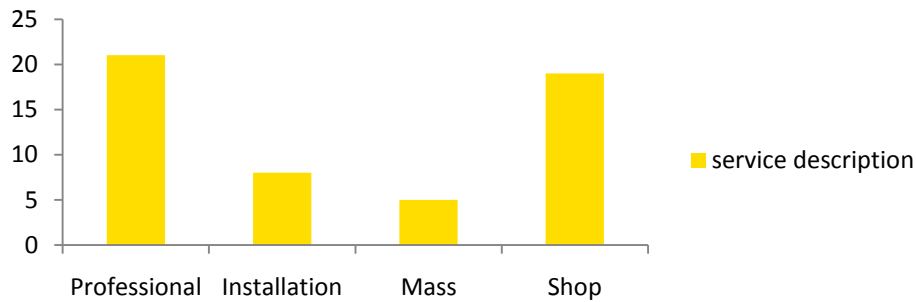
Shop services

Shop service characteristics			
Capital intensive		Labour intensive	Total
3	7	9	19
Knowledge work		Hand work	Total
16		3	19
Low volumes		High volumes	Total
7	4	8	19
Standardization		Custom made	Total
11	4	4	19
Service delivered by humans		Service delivered by machines	Total
9	4	5	18
Low skilled		Highly skilled	Total
2	1	16	19
Single customer contact		Permanent contact with customers	Total
0	1	17	18

Shop services know both capital as well as labour intensive activities. Most service actions are characterized as knowledge intensive. Shop services are standardized and delivered in both low as well as high volume ranges. Service is delivered partly by humans and partly through machines. Service employees are highly skilled and customer interactions are on a permanent base.

Best suitable service description

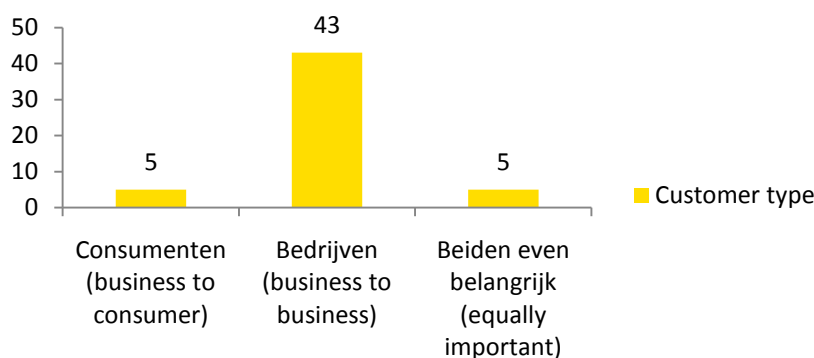
N Valid 53	Missing 27	Mean 2,42	Mode 1
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Respondents were asked to choose a service situation best applicable to their firm. These sentences were Dutch descriptions, based on the ideas of Silvestro et al.'s professional, mass and shop firms, adjusted with a description suitable for installation services as designed by Flikkema et al. (2010). Most service firms within this sample identify themselves with the description of a professional service firm. The second most chosen description is the service shop.

Most important customer

N Valid 53	Missing 27	Mean 2	Mode 2
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Most of the respondents are operating in a business to business market.

Internal innovation motives

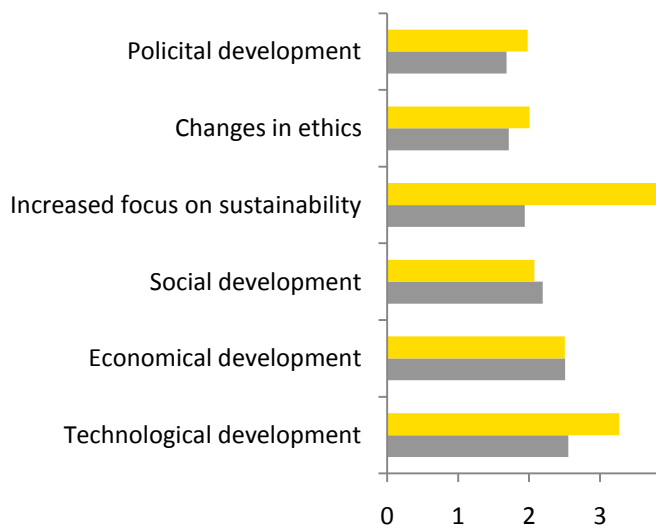
Item score 1 Disagree to 3 Agree



Based on the Figure above, one of the main reasons to implement or market the innovation relates to an increase in customer loyalty other important elements are enlarged flexibility, merchantability, decreased production costs, strengthening of the position and following competition.

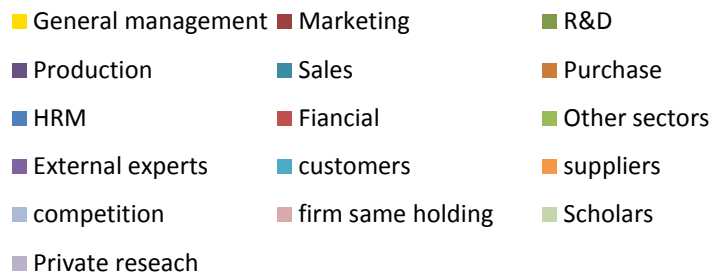
Reactive elements to innovate

Item score 1 Disagree to 3 Agree



Economical and Technological development are the most important reactive elements.

Idea generators



Ideas are mainly generated by the general management of a service firm, the second sources are customers, R&D and marketing. Purchase, HRM and financial departments are not mentioned as idea generating departments.

Activities behind the generation and further development of the innovation

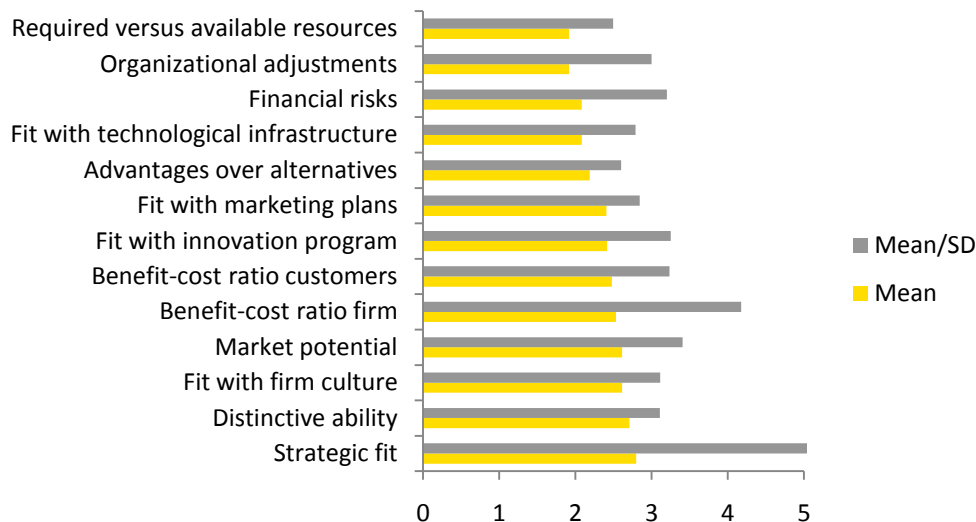
Item score 1 No role 2 small role to 4 big role



Conversations with customers and internal brainstorm are the most important activities in order to generate ideas and to further develop them. Participation in industry organizations, training and education play almost no role.

Most important selection criteria

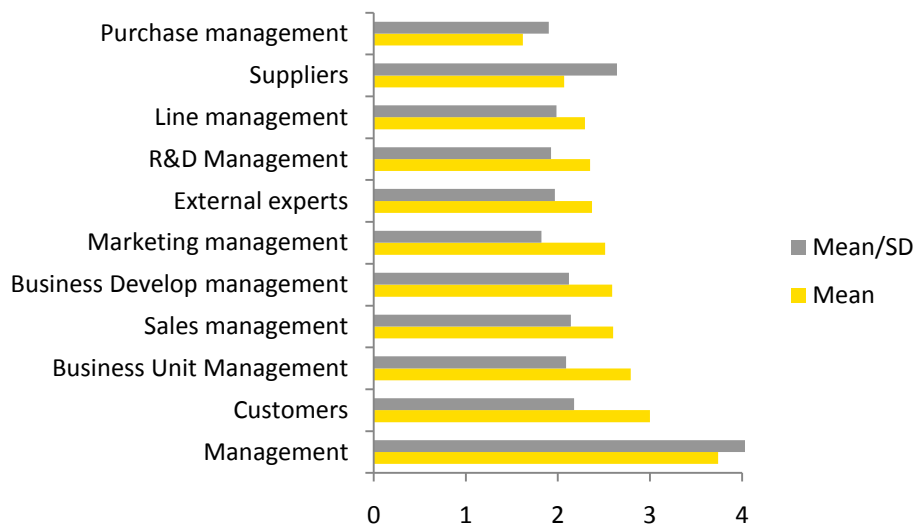
Item score 1 Disagree to 3 Agree



Advantages over alternatives and fit with marketing plans seem to be the least important selection criteria within the decision-making process, whether to start with an innovation. Based on the means distinctive ability, fit with firm culture and market potential are important decision criteria.

Profession involved within the decision-making process

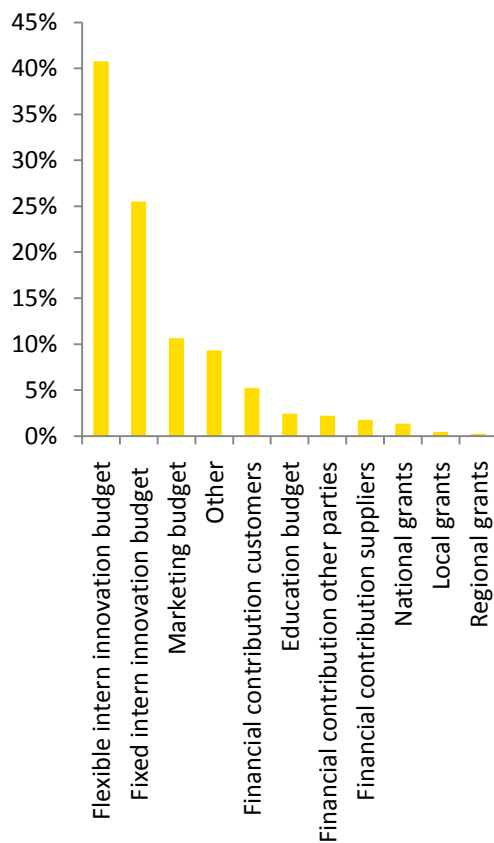
Item score 1 no role, 2 small role to 4 big role



General management, Sales management and business development management play an important role. Purchase management, Line management, R&D management, External experts and suppliers do not have a role during the decision-making process.

Financial resources qualified

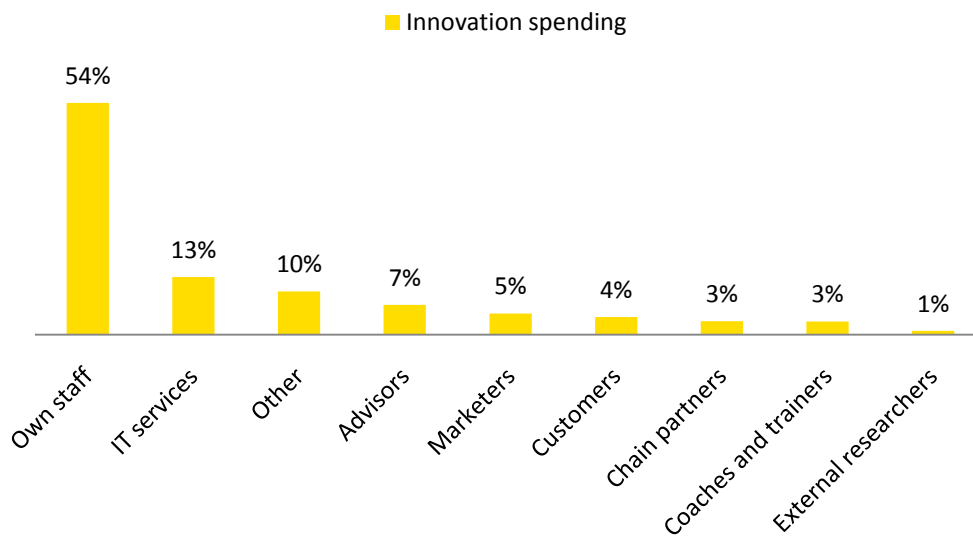
N Valid 45 Missing 35



Within the Table above, the mean scores in relation to innovation budgets are presented. Most financial resources in relation to innovation activities are generated from flexible internal innovation budgets (mean 41%). Fixed internal innovation budgets are assigned as well (26%). No budgets are generated through local, regional or European grants. Furthermore financial contribution from competitors was not available.

N Valid 45 Missing 35

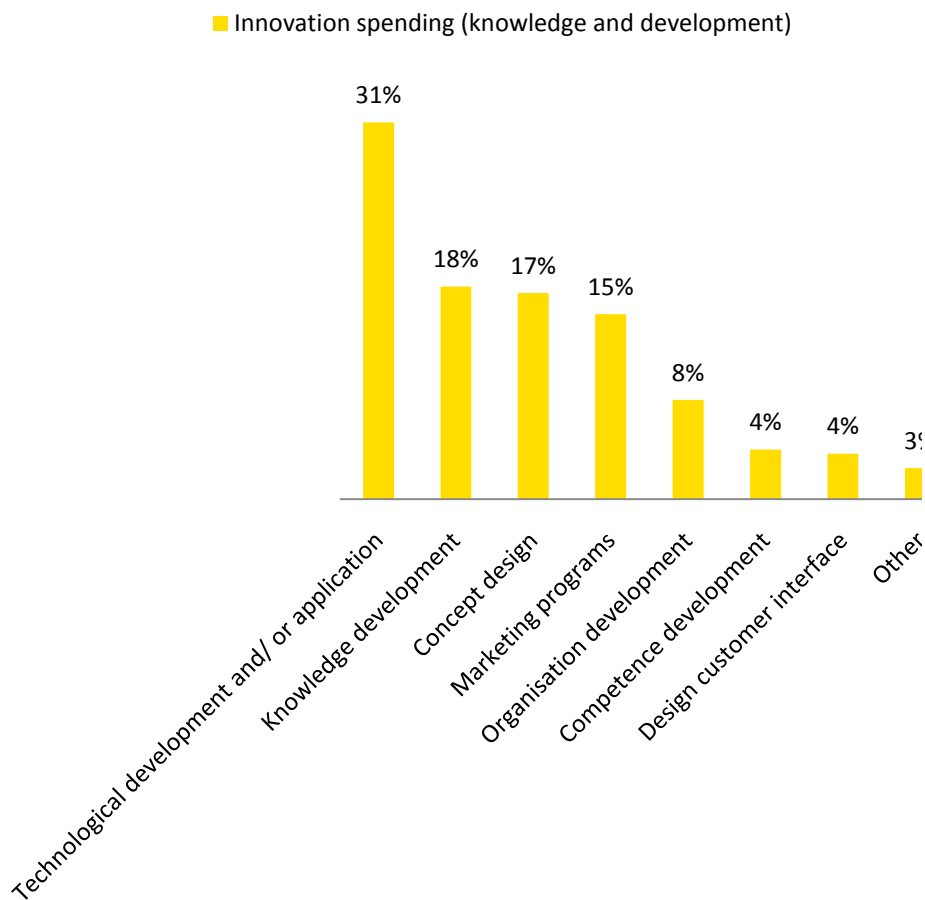
Innovation spending in relation to professions



Within the Table above, the main innovation spending sources are given. Within this Table it becomes clear that most financial resources are spend on own staff, followed by IT services and other.

Innovation spending in relation to knowledge and development

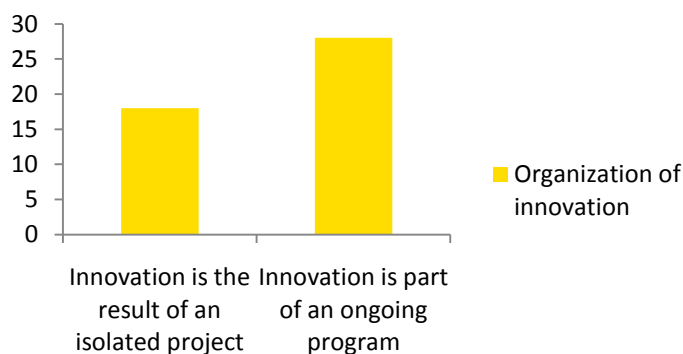
N Valid 45 Missing 35



While concentrating on the expenses of the innovation budget, it becomes visible that service firm expend quite some financial resources on technological development or applications. Furthermore knowledge development, concept design and marketing programs are important elements. The other category is quite small.

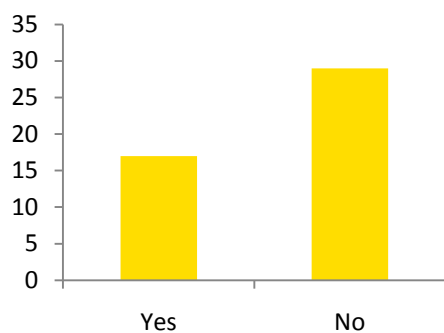
Organization of innovation

N Valid 46 Missing 34 Mode 2 Mean 1,61



Within most service firms (n28), innovation is part of an ongoing program.

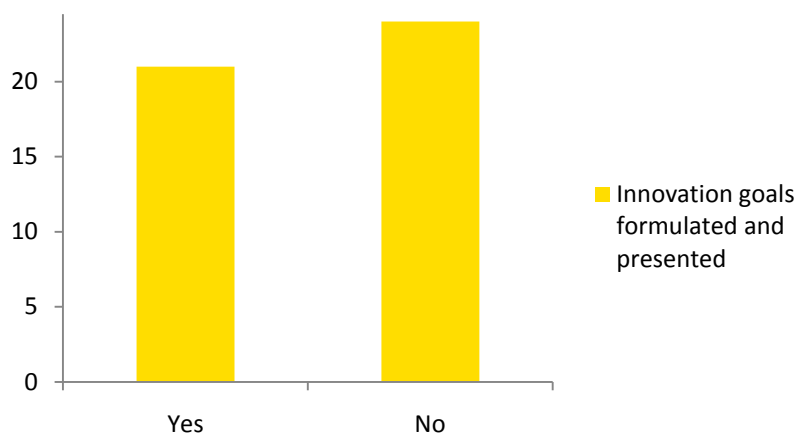
Innovation themes assigned



N Valid 46 Missing 34 Mode 2 Mean 1,63

Most service firm did not assign (n29) a special innovation theme in regard to their innovation activities.

Innovation goals formulated and presented

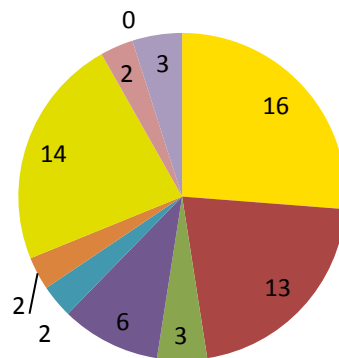


N Valid 46 Missing 34 Mode 2 Mean 1,53

Most service firms did not formulate or present innovation goals (n24) within their firm on a regular basis.

Profession responsible for innovation

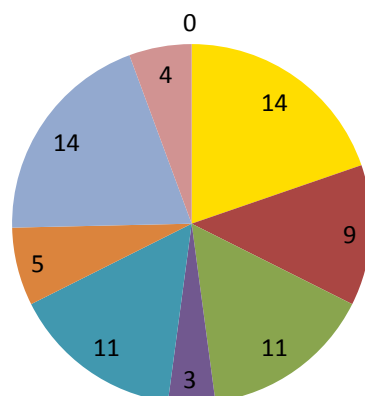
- General manager
- Marketing manager
- Sales manager
- Business Development manager
- Purchase manager
- Business Unit manager
- R&D manager
- Product manager
- Operations manager
- Other



The general manager is the main responsible profession in relation to innovation within service firms, closely followed by business development managers and business unit managers. The purchase manager is not mentioned as a responsible profession at all.

Profession responsible for market launch/ implementation

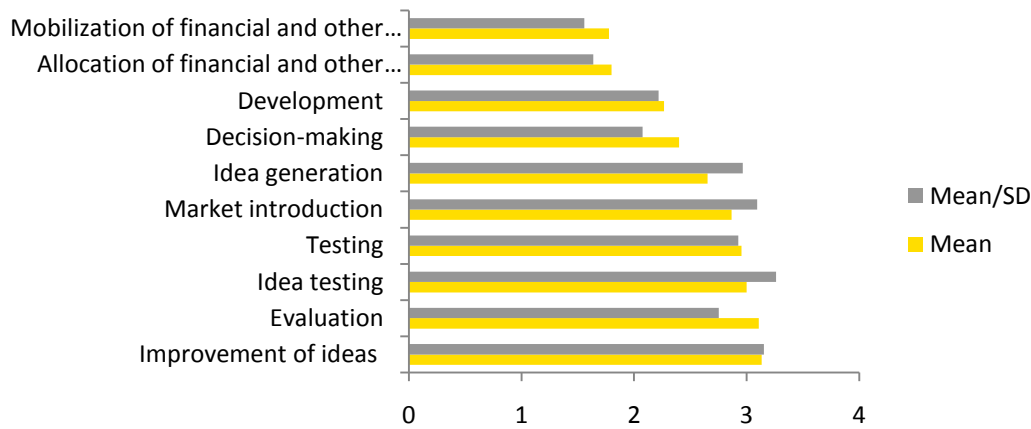
- General manager
- Marketing manager
- Sales manager
- Business Development manager
- Purchase manager
- Business Unit manager
- R&D manager
- Product manager
- Operations manager



The Figure above shows, that the responsibility for market launch or implementation is presented within different professions. General management, business management, the role of the business unit manager disappears a little compared to the formal Figure. Other important professions are sales and marketing. Again purchase is not mentioned.

Importance of customers in relation to the innovation process

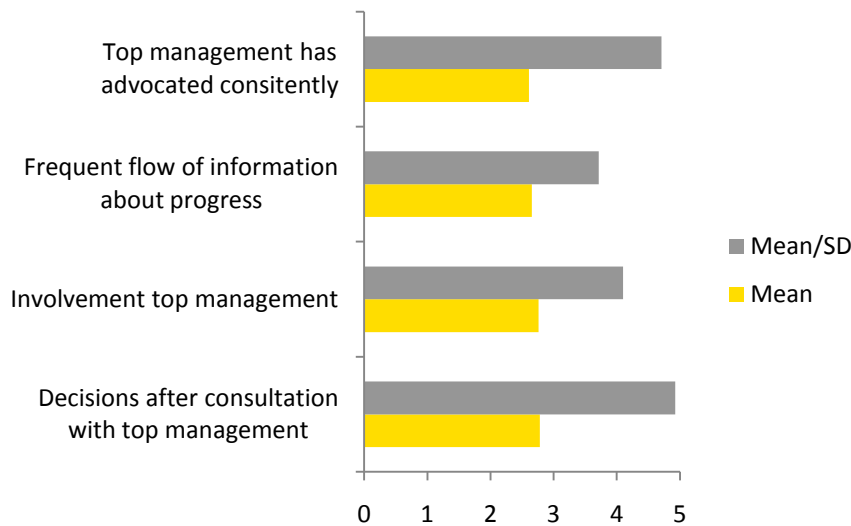
Item score 1 no meaning 2 insignificant meaning to 4 large meaning



While concentrating on the innovation development process and the role of customer, it becomes visible that improvement of ideas, evaluation, idea testing and market introduction the most important stages. Customers are not involved during the mobilization and allocation of financial resources and within the actual development/design stage.

Role of top management in relation to the innovation process

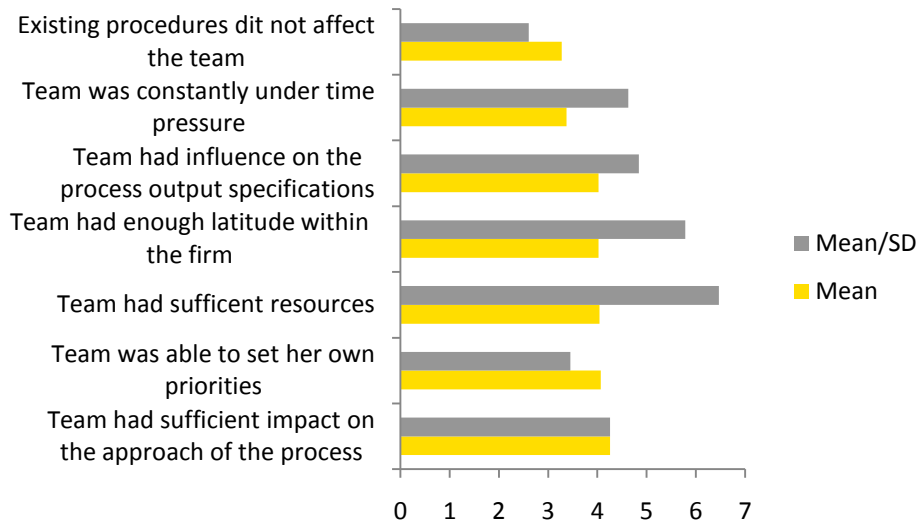
Item score 1 Disagree to 3 Agree



The role of top management is important within the innovation process. All selected criteria received a high score, although they are skewed. While referring to the mean scores, regular involvement of top management and frequent flows of information concerning progress are important items with regard to top management involvement.

Autonomy of the team

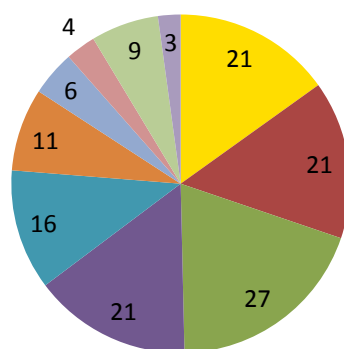
Item score 1 totally disagree to 5 totally agree



Based on the Figure above, it is visible that the innovation teams were able to impact the approach of the innovation process, could set their own priorities and were equipped with enough resources and had enough latitude. The teams are least satisfied with the existing procedures.

Professions involved within the innovation team

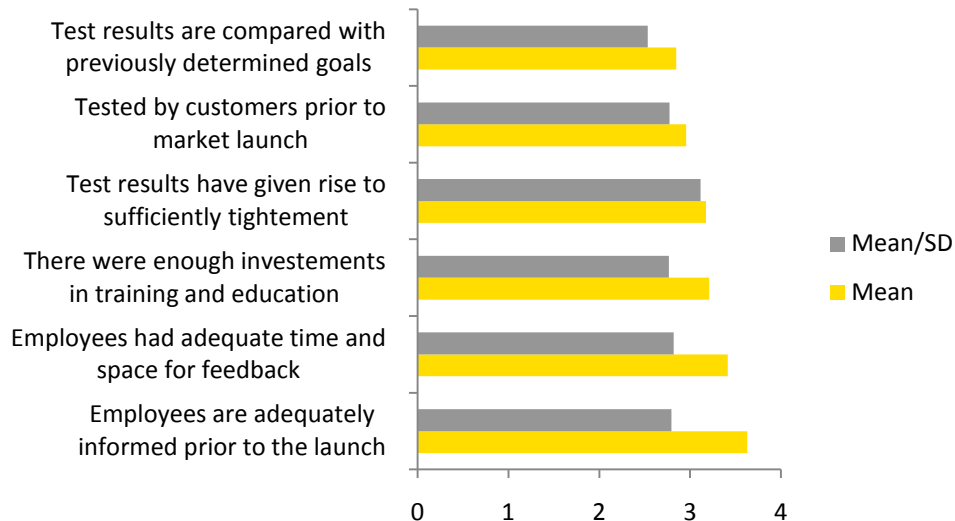
- Marketing
- R&D
- Business Development
- Sales
- FO staff
- BO staff
- Purchase
- HRM
- Finance
- Other



Based on the Figure it becomes clear that business development, Sales, R&D and back office staff are most of the times involved within an innovation team. HRM, Purchase and finance are the least involved professions.

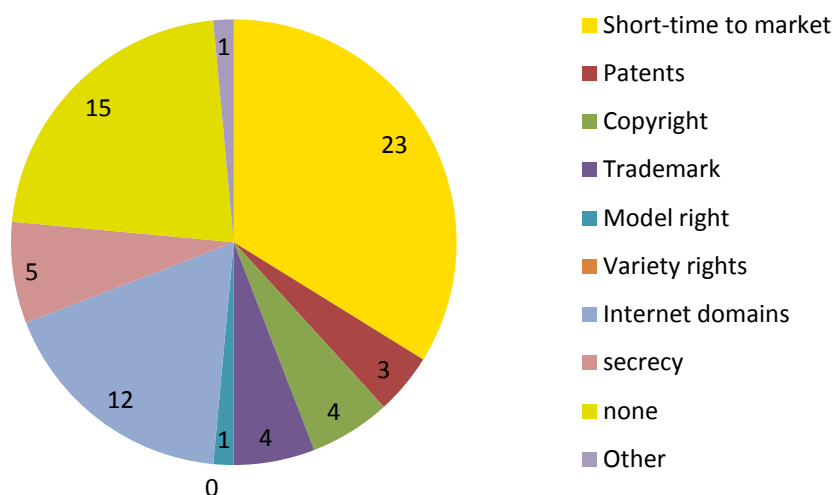
Testing and embedment of innovation

Item score 1 totally disagree to 5 totally agree



While referring to the Figure above, employees are well informed before the actual launch of the innovation. Furthermore, employees had enough time and space to provide feedback. Customer testing and comparison of test results with determined goals are determined as less important roles.

Protection instruments



In case service firms protect their innovation, they mainly use short-time to the market periods in order to protect their innovations. Furthermore, internet domains and secrecy are used. Variety rights are never indicated.

5.3 Depth, analysis

Research items included in the central research question are; management of innovation, service characteristics and firm characteristics. The structure of this analysis section correspondent with these items and is adjusted with idea generation and innovation types. All elements are positioned in the adjusted research model as presented below. We analyzed the data available while making use of innovation management items in relation to 1) firm size, 2) service type, 3) innovation type, 4) Service percentage of annual turnover and 5) customer type served. Statistical tests used are Pearson chi-squares, Mann withney, Kruskal Wallis, ANOVA and one sample T-tests.

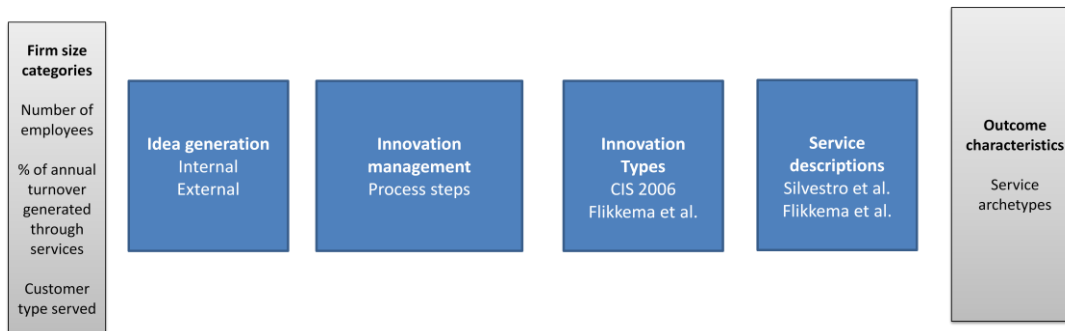


Figure 12: adjusted research model

Management characteristics related to firm size

Figure 13 shows the significant meanings between management characteristics and firm size. During the analysis of these relations and differences we made a distinction between firms <100 which we will call small firms from now on and firms >100 which we call large firms.

Idea generation

While concentrating on idea generation it becomes visible that small service firms cooperate more often with other parties than large firms.

Decision-making

Concentrating on decision making it becomes clear that large firms clearly incorporate business unit managers in their decision-making process, assisted by marketing, purchase, R&D and Line managers. Small firms make extensive use of general management, sometimes assisted by marketing and R&D managers. In case R&D management is involved they often receive a dominant role.

Finance and allocation

Small firms spend on average 1,1% of their marketing budget on innovation. Large service firms spend 1/6, 17,6% of their marketing budget on innovation and spend on average 1,19% of their innovation budget in order to hire external expertise. Concentrating on spending concerning knowledge and development it becomes visible that small firms spend on average 2,22% of their budget to organizational development and large firms 11,5% .

Development

Within small firms general management is main responsible for total innovation trajectories (from start to launch). The general management role is less principal within large firms. In these firms business unit management is main responsible for the development phase of the innovation and shares this responsibility with market management at the launch phase. Large firms assign an important role to customers during development stages, small firms incorporate their customers as well although, they never assign a big role to customer involvement. While pointing attention on autonomy of innovation teams, it becomes visible that innovation teams of large firms always work under pressure of time. Small firms do indicated working against the clock, though, less overriding.

Test & Launch

Once an innovation is designed, developed and implemented it might be valuable to protect the innovation or its enclosed ideas. There are multiple ways to protect the innovation 85% of the large service firms in our sample protect their innovation, compared to 47% of small service firms.

Category	Item	Firm sizes	
		<100	>100
Idea generation	Activities behind the generation and further development of the innovation		
	Co-operation with other parties N45 Kruskal Wallis 10,53 DF 3, P0,015	<100 co-operate	far more with other parties
Decision-making	Most important selection criteria	No significant meaning because coincidence cannot be falsified	
	Professions involved within the decision-making process		
	Business Unit Management N42 Kruskal Wallis 21,26, DF 3, P 0,000	<100 no role, >100 big role	
	Marketing Management N42 Kruskal Wallis 13,32, DF 3, P 0,004	<100 most often no role, >100 small role or big role	
	Purchase Management N41 Kruskal Wallis 11,60, DF3, P0,009	<100 no role, >100 small role	
	R&D Management N42 Kruskal Wallis 10,98, DF3, P0,012	<100 no role or big role, >100 division over all possibilities	
Finance	Line Management N43 Kruskal Wallis 16,49, DF3, P0,001	<100 no role >100 division over all possibilities	
	Financial resources qualified		
	Marketing budget Independent-Samples T-test, T -2,644, DF 27, P 0,014	<100 spend on average 1,11% of their marketing budget on innovation.	>100 spend on average 17,6% of their marketing budget on innovation.
	Innovation spending in relation to professions		
Finance	External researchers Independent-Samples T-test, T -2,078, DF 25, P 0,048	<100 do not spend innovation budgets on external researchers.	>100 spend on average 1,19% of their innovation budget to external researchers
	Innovation spending in relation to knowledge and development		
	Organizational development Independent-Samples T-test, T -2,291, DF 29, P 0,030	<100 spend on average 2,22% of their innovation budget on organizational development.	>100 spend on average 11,15% of their innovation budget on organizational development.
	Development		
Development	Organization of innovation development	No significant meaning because coincidence cannot be falsified	
	Innovation themes assigned	No significant meaning because coincidence cannot be falsified	
	Innovation goals formulated and presented	No significant meaning because coincidence cannot be falsified	
	Profession responsible for innovation		
	General Manager N45 Mann Withney 97,50, Z -3,59, P 0,000	<100 General management mostly involved	>100 General management seldom involved
	Business Unit Manager N45 Mann Withney 327,50, Z 3,17 P 0,002	The Business Unit Manager is more often involved within firms >100	
	Profession responsible for market launch/implementation		
	General Manager N45 Mann Withney 84,00, Z -3,63, P 0,000	The General manager is more often involved within firms <100	
	Marketing Manager N45 Mann Withney 269, Z 2,53, P 0,030	The Marketing manager is more often involved within firms >100	
	Importance of customers during the innovation process		
	Development of the innovation N 44 Kruskal Wallis 9,65, DF 3, P 0,022	<100 customers play never a big role during the innovation process.	>100 customers play often a big role during the innovation process.
	Role of top management in relation to the innovation process	No significant meaning because coincidence cannot be falsified	
Autonomy of the team			
Team operated constantly under time pressure N42 Kruskal Wallis 9,26, DF 3, P 0,010	<100 half agreement/half disagreement.	>100 no disagreement, meaning pressure at all times.	
Professions involved within the innovation team	No significant meaning because coincidence cannot be falsified		
Test & Launch	Testing and embeddedment of the innovation	No significant meaning because coincidence cannot be falsified	
	Tools used in relation to protect the innovation		
	No protection instrument N45, Mann Withney 125, Z -2,64, P 0,008	<100 53% does not protect an Innovation	>100 15% does not protect an innovation

Figure 13: significant differences management/firm size

Management characteristics related to service description

Figure 14 shows the significant meanings between management characteristics and service descriptions.

Idea generation

Conversations with customers play a big role concerning idea generation within most of the four service archetypes. Only mass service firms do not consider conversations with their customers as one of the major ways to generate new ideas.

Decision-making

Examine the selection criteria for innovation, fit with firm culture received a high agreement percentage with exception of the mass service firm. Within mass firms cultural fit seems less important instead, fit with technological infrastructure is foremost an important selection criteria. A second striking observation relates to the benefit-cost ratio of the (potential) customer which is most dominant within professional and shop services, in addition marketing is least prevailing within shop services. Pointing attention to the professions involved within the decision-making process it becomes clear that installation firms most often incorporate the advice of external experts compared to mass services who never assign a large role to experts.

Finance and allocation

In regard to finance and allocation, mass services attract the most attention within this sample. 20% of the mass service firms included within this sample received 80% of their innovation budget through financial contribution of suppliers. In addition, 50% of the innovation budget of these firms is assigned to technological developments or applications.

Development

Mass services are least liking to predetermine innovation goals, installation firms on the other hand most often do assign innovation goals to their innovation projects. The assistance of back offices service staff during the innovation development is most dominant within mass services, 80% incorporated these professions within their innovation teams. Another important profession within the innovation team of a mass firm is the purchase department.

Test & Launch

Concentrating on the test results of an innovation, most service shops indicated that test results provide enough motivation for improvement. Mass services indicated the least improvement triggers.

Category	Item	Score	Service descriptions			
			Professional	Installation	Shop	Mass
Idea generation	Activities behind the generation and further development of the innovation					
	Conversations with customers N49 Pearson Chi-square 22,18, DF 9, P 0,008	Big role	79%	75%	65%	0%
Decision-making	Most important selection criteria					
	Fit with technological infrastructure N48 Pearson Chi-square 13,77, DF 6, P 0,032	Agree	33%	0%	71%	40%
	Fit with marketing plans N49 Pearson Chi-square 13,19, DF 6, P 0,040	Agree	68%	25%	76%	60%
	Fit with firm culture N49 Pearson Chi-square 14,39, DF 6, P 0,026	Agree	84%	75%	65%	0%
	Benefit-cost ratio customers N48 Pearson Chi-square 19,07, DF 6, P 0,004	Agree	72%	50%	71%	20%
	Professions involved within the decision-making process					
Finance	External experts N43 Pearson Chi-square 20,49, DF 9, P 0,015	Big role	25%	71%	20%	0%
	Financial resources qualified					
	Financial contribution suppliers ANOVA Mean square 379,259, F 3,037, P 0,040		0%	0%	0%	20% of the Mass services involved in this study, receive 80% of their innovation budgets from suppliers.
	Innovation spending in relation to professions		No significant meaning because coincidence cannot be falsified			
	Innovation spending in relation to knowledge and development					
	Technological development and/or application ANOVA Mean square 5539,777, F 7,658, P 0,000					Most Mass and shop firms spend 50% of their innovation budget on technological development and/or application
Development	Organization of innovation development					
	Innovation themes assigned		No significant meaning because coincidence cannot be falsified			
	Innovation goals formulated and presented					
	N45 Pearson Chi-square 9,036, DF, 3, P 0,029	Goals formulated	59%	75%	33%	0%
	Profession responsible for innovation					
	Profession responsible for market launch/implementation		No significant meaning because coincidence cannot be falsified			
	Importance of customers during the innovation process					
	Importance of customers during the innovation process		No significant meaning because coincidence cannot be falsified			
	Role of top management in relation to the innovation process					
	Role of top management in relation to the innovation process		No significant meaning because coincidence cannot be falsified			
Autonomy of the team						
Autonomy of the team		No significant meaning because coincidence cannot be falsified				
Test & Launch	Professions involved within the innovation team					
	Back Office service staff Pearson Chi-square 9,693, DF 3, P 0,021	Involved within innovation team	18%	29%	13%	80%
	Purchase Pearson Chi-Square 11,101, DF 3, P 0,011		6%	0%	13%	60%
	Testing and embeddedment of the innovation					
	Test results have given sufficient motives to improve the innovation Pearson Chi-square 14,886, DF 6, P 0,021	Agree	33%	38%	73%	20%
	Tools used in relation to protect the innovation		No significant meaning because coincidence cannot be falsified			

Figure 14: significant differences management/service description

Management characteristics related to innovation types

Figure 15 shows the significant meanings between management characteristics and innovation types.

Idea generation

No significant meaning because coincidence cannot be falsified.

Decision-making

Cost-benefit ratios are important criteria during the selection process of every type of innovation. However, there is one innovation type outstanding, recombinatorial innovation. While aiming at recombinatorial innovation, 80% of the firms selected cost-benefit ratio's as an important selection item. Secondly, the possibility to create distinctive ability through the innovation is an important aspect as well with exception in case of process innovation. However, this does not mean that service firms cannot create distinctive ability through process innovations.

Finance and allocation

Both during process innovations and recombinatorial innovations some service firms, respectively (22% and 10%) generated their innovation budgets for 100% from sources not incorporated in our web survey. Most service firms only slightly spend parts of their innovation budget to training and coaching. Most spending in this category is incorporate during marketing innovations. Spending with regard to IT services is mostly applicable during process innovations and least during recombinatorial innovation. During recombinatorial innovation most budget is spend on competence development. Competence development is far less available within the other innovation types.

Development

In respect to the resources available for the innovation team it becomes clear that the least resources are available within recombinatorial innovation, only 38% of the firms making use of recombinatorial innovation agreed on the statement "enough resources available for the team" compared to at least 80% of the other innovation types and even 100% during marketing innovations. While concentrating on the professions incorporated in the innovation team, it becomes clear that the marketing department is included within marketing innovation projects 100% of the times, while the R&D department is never involved in the innovation team during these innovations. Furthermore the marketing department is often included during product/service innovations, where R&D receives a more dominant role.

Test & Launch

Except for the product/service innovation innovations, employees are adequate informed prior to the actual market launch or implementation of an innovation.

Category	Item	Score	Innovation types			
			Process	Product/Service	Recombinatorial	Marketing
Idea generation	Activities behind the generation and further development of the innovation		No significant meaning because coincidence cannot be falsified			
Decision-making	Most important selection criteria	Agree				
	Benefit-cost ratio firm N49 Pearson Chi-square 15,029, DF 6, P 0,020		64%	68%	80%	67%
	Distinctive ability N48 Pearson Chi-square 14,142, DF 6, P0,028		46%	95%	90%	83%
	Professions involved within the decision-making process		No significant meaning because coincidence cannot be falsified			
Finance	Financial resources qualified					
	Other, ANOVA Mean square 1955,767, F 2,925, P 0,045	100% of the innovation budget from an other source	22%		10%	
	Innovation spending in relation to professions					
	Coaches and Trainers ANOVA Mean square 349,367, F 3,282, P 0,030	No spending	70%	95%	89%	60%
	IT services ANOVA Mean square 2370,847, F 4,756, P 0,006	No spending	40%	76%	89%	60%
	Innovation spending in relation to knowledge and development					
	Competence development ANOVA Mean square 237,526, F 2,949, P 0,044	No spending	78%	81%	50%	80%
Development	Organization of innovation development		No significant meaning because coincidence cannot be falsified			
	Innovation themes assigned		No significant meaning because coincidence cannot be falsified			
	Innovation goals formulated and presented		No significant meaning because coincidence cannot be falsified			
	Profession responsible for innovation		No significant meaning because coincidence cannot be falsified			
	Profession responsible for market launch/implementation		No significant meaning because coincidence cannot be falsified			
	Importance of customers during the innovation process		No significant meaning because coincidence cannot be falsified			
	Role of top management in relation to the innovation process		No significant meaning because coincidence cannot be falsified			
	Autonomy of the team					
	Team had sufficient resources Pearson Chi-square 17,4, DF 6, P 0,008	Agree	89%	91%	38%	100%
	Professions involved within the innovation team					
	Marketing Pearson Chi square 8,574, DF 3, P 0,036	Involved	30%	52%	25%	100%
	Research and Development Chi square 8,159, DF 3, P 0,043	Involved	40%	67%	38%	0%
Test & Launch	Testing and embedment of the innovation					
	Employees are adequately informed prior to the launch Chi square 13,202, DF 6, P 0,040	Agree	90%	38%	90%	80%
	Tools used in relation to protect the innovation		No significant meaning because coincidence cannot be falsified			

Figure 15: significant differences management/innovation types

Management characteristics related to service percentage of annual turnover

Figure 16 shows the significant meanings between management characteristics and the service percentage of annual turnovers. In this respect we defined two categories, firms with turnovers for 100% generated through services, which we call full service firms and firms with turnovers for less than 100% generated through services, which we call other firms.

Idea generation

No significant meaning because coincidence cannot be falsified.

Decision-making

Fit with firm culture seems very important within 100% service firms, 81% of these firm indicated cultural fit as an important selection criteria, compared to 31% of the other firms.

Finance and allocation

66% of the full service firms assign a fixed innovation budget in order to finance their innovation projects. 33% of the other firms assign a fixed budget.

Development

Standard operating procedures seem to harm the effectiveness of the innovation teams within both types. 59 % of the full service innovation teams and 42% of the other firms are affected by standard operating procedures. While focussing on the professions involved within the innovation teams, it becomes visible that 48% of the full service firms incorporate Front-Office service staff within their innovation teams, compared to 15% of the other firms. The fact that Front-Office service staff is incorporated within the innovation team might declare the difficulties experience with regard to standard operating procedures. Front-office employees are in direct contact with customers and probably have less room to move and work on innovation during their operational activities.

Test & Launch

Full service firms are less likely to take out a patent in order to protect their innovations. Other firms do patent their innovations 23% of the cases.

Category	Item	Score	Service percentage of annual turnover	
			100%	<100%
Idea generation	Activities behind the generation and further development of the innovation		No significant meaning because coincidence cannot be falsified	
Decision-making	Most important selection criteria		No significant meaning because coincidence cannot be falsified	
	Fit with firm culture N44 Kruskal Wallis 9,988, DF 2, P 0,007	Agree	81%	31%
	Professions involved within the decision-making process		No significant meaning because coincidence cannot be falsified	
Finance	Financial resources qualified		No significant meaning because coincidence cannot be falsified	
	Fixed intern innovation budget Independent-Samples T-test, T -2,279, DF 39, P 0,028	No budget	66%	33%
	Innovation spending in relation to professions		No significant meaning because coincidence cannot be falsified	
	Innovation spending in relation to knowledge and development		No significant meaning because coincidence cannot be falsified	
Development	Organization of innovation development		No significant meaning because coincidence cannot be falsified	
	Innovation themes assigned		No significant meaning because coincidence cannot be falsified	
	Innovation goals formulated and presented		No significant meaning because coincidence cannot be falsified	
	Profession responsible for innovation		No significant meaning because coincidence cannot be falsified	
	Profession responsible for market launch/implementation		No significant meaning because coincidence cannot be falsified	
	Importance of customers during the innovation process		No significant meaning because coincidence cannot be falsified	
	Role of top management in relation to the innovation process		No significant meaning because coincidence cannot be falsified	
	Autonomy of the team		No significant meaning because coincidence cannot be falsified	
	Existing procedures did not affect the team N39 Kruskal Wallis 6,345, DF 2, P 0,042	Agree	41%	58%
	Professions involved within the innovation team		No significant meaning because coincidence cannot be falsified	
	Front-Office service staff N40 Mann withney 130,00, Z -1,986, P 0,048	Included within the innovation team	48%	15%
Test & Launch	Testing and embedment of the innovation		No significant meaning because coincidence cannot be falsified	
	Tools used in relation to protect the innovation		No significant meaning because coincidence cannot be falsified	
	Patents N43, Mann Withney 102, Z 2,652, P 0,030	Patents used to protect the innovation	0%	23%

Figure 16: significant differences management/service percentage of annual turnover

Management characteristics related to customer type

Figure 17 shows the significant meanings between management characteristics and the customer type served. We distinguish three categories, business to consumer (B2C), business to business (B2B) and both equally important.

Idea generation

Conversations with suppliers is foremost an idea generation activity within firms serving both B2B and B2C, slightly followed by B2C firms from which 20% assign a big role to this activity.

Decision-making

Although conversations with suppliers are very important during the idea generation phase of firms serving both types of customers, they do not provide a big role during the decision stage of these firms. Suppliers do play a big role during decision making within B2C firms and slightly within B2B firms.

Finance and allocation

We have seen that suppliers provide a big role during the decision making process of B2C firms. In line with this observation it is not surprising that 20% of the B2C firms receives innovation budget from their suppliers. While zooming in on the innovation spending related to professions it becomes visible that most service firm spend innovation budget on their own employees. Only within the B2B firms 17% of the firms reported not to spend innovation budget on their own employees. Spending on coaches and training is most visible within B2C firms and least within B2B firms. Spending on chain partners is most likely within firm serving both types and least within B2C firms.

Development

Business unit managers are responsible for innovation particularly within firms serving both customer types. B2C firms do not assign responsibility to the business unit managers. Customers play an important role during the development stage of the innovation process, within both B2C as well as combination service firms. In regard to the formation of the innovation team it becomes visible that HRM and finance departments are mostly incorporated within innovation trajectories of B2C firms, while they are never incorporated within firms serving B2B as well as B2C customers.

Test & Launch

Service firms with a B2C component are most likely to test their innovation prior to the market launch or implementation and to compare their test results with previously determined goals. Testing with customers is most dominant within firms were both B2B and B2C are served while comparison of test results with determined goals is most dominant within B2C firms. Pointing attention protection of the innovation it becomes clear that 20% of the firms serving both types of customers found another way to protect their innovation, not incorporated in our web survey.

Category	Item	Score	Customer type		
			B2C	B2B	Both
Idea generation	Activities behind the generation and further development of the innovation				
	Conversations with suppliers N48 Pearson Chi Square 18,149, DF 6, P 0,006	Big role	20%	3%	60%
Decision-making	Most important selection criteria (Pearson Chi-square)		No significant meaning because coincidence cannot be falsified		
	Professions involved within the decision-making process				
Finance	Suppliers N44 Pearson Chi-square 31,526, DF 6, P 0,000	Big role	80,0%	8,6%	0,0%
	Financial resources qualified				
	Financial contribution suppliers ANOVA Mean square 568,889, F 4,667, P 0,015	No contribution	80%	100%	100%
	Innovation spendings in relation to professions				
	Coaches and Trainers ANOVA Mean square 369,156, F 3,317, P 0,046	No spending	60%	89%	80%
	Own staff ANOVA Mean square 7815,622, F 7,000, P 0,002	No spending	0%	17%	0%
	Chain partners ANOVA Mean square 902,222, F 6,877, P 0,003	No spending	100%	94%	60%
	Innovation spendings in relation to knowledge and development		No significant meaning because coincidence cannot be falsified		
Development	Organization of innovation development		No significant meaning because coincidence cannot be falsified		
	Innovation themes assigned		No significant meaning because coincidence cannot be falsified		
	Innovation goals formulated and presented		No significant meaning because coincidence cannot be falsified		
	Profession responsible for innovation		No significant meaning because coincidence cannot be falsified		
	Profession responsible for market launch/implementation				
	Business Unit Manager N46 Pearson Chi-square 6,603, DF 2, P 0,037	Responsible	0%	17%	60%
	Importance of customers during the innovation process				
	Development N45 Pearson Chi-square 13,291, DF 6, P 0,039	Big role	60%	11%	60%
	Role of topmanagement in relation to the innovation process (Pearson Chi-square)		No significant meaning because coincidence cannot be falsified		
	Autonomy of the team (Pearson Chi-square)		No significant meaning because coincidence cannot be falsified		
	Professions involved within the innovation team				
	HRM N44 Pearson Chi-square 6,704, DF 2, P 0,035	Included within innovation team	40%	6%	0%
	Finance N44 Pearson Chi-square 12,872, DF 2, P 0,002	Included within innovation team	80%	15%	0%
	Testing and embedment of the innovation				
Test & Launch	Tested by customers prior to market launch N46 Pearson Chi-square 10,302, DF 4, P 0,036	Agree	60%	25%	80%
	Test results are compared with previously determined goals N46 Pearson Chi-square 11,886, DF 4, P 0,018	Agree	80%	17%	60%
	Tools used in relation to protect the innovation				
	Other protection tool N46 Pearson Chi-square 8,382, DF 2, P 0,015	Used as protection tool	0%	0%	20%

Figure 17: significant differences management/customer type

Service characteristics vs. service description

We used use of Pearson Chi square tests (both variables are scaled ordinal) on all characteristics service characteristics defined in our questionnaire to examine whether service characteristics depend on the service description In Figure 18 the entire test statistics are presented. Although, the data does not fully satisfy the assumptions of the Pearson Chi square test (all frequencies must be at least one and only 20% of the cells <5 observations) the test results provide a first insight into possible causal links.

Service Characteristics	/	Service descriptions	Pearson Chi Square	DF	P
Capital Intensive -labour Intensive	/	Service descriptions	18,545	6	0,005
Knowledge Work - Handwork	/	Service descriptions	8,998	6	0,174
Low Volumes - High Volumes	/	Service descriptions	6,505	6	0,369
Standardization - Custom Made	/	Service descriptions	19,888	6	0,003
Delivery through Humans - Machinal Delivery	/	Service descriptions	12,477	6	0,052
Low Skilled - High Skilled	/	Service descriptions	18,483	6	0,005
Single Contact - Permanent Contact	/	Service descriptions	4,919	6	0,554

Figure 18: significant differences service characteristics/service description

The Figure shows that, while using a confidence interval of 95% the service characteristics, capital/labour intensive, standardization/ customized and low skilled/ high skilled differed significantly between the service type groups. This outcome indicates that there is a relation between these characteristics and service description.

Referring back to the descriptive section, it becomes visible that professional and installation services are clearly labour intensive services. Mass and shop services on the other hand make use of capital as well as labour intensive services.

Regarding standardization or custom made, professional service firms are clearly custom made, installation services are positioned more in the middle, leaning to custom made. Mass services make primary use of standardized services, while shop services are positioned in the middle category while leaning to standardization.

Finally, professional services make extensive use of high skilled employees; installation services are in the middle but did not chose the option low skilled at all. Mass service firms are equally divided and make use of low as well as high skilled employees. Shop services make mainly use of high skilled employees however; some positioned themselves in the position of mainly low skilled employees.

6. Conclusion and recommendations



Where do ideas for innovation in service firms come from?

Ideas are mainly generated by the general management of service firms. Second conversations with customers and internal brainstorms are the most important activities in order to generate ideas and to further develop them. Particularly, professional, installation and shop service firms indicated conversations with customers as important during idea generation and further development of innovations. Third, R&D and marketing professions are contributively idea generators within every type of service firm. Fourth, conversations with suppliers are contributively within service firms particularly serving B2C of B2B/B2C customers. Fifth, small service firms cooperate the most with other parties in order to generate ideas. Sixth, overall participation in industry organizations, training and education seem to play almost no role. Seventh, Purchase, HRM and financial departments are never mentioned as idea generating departments.

How are ideas for innovation in service firms transformed into marketable and valuable offers, and which characteristics of service firms, service type, innovation type, and customer served vary in relation to the management of innovation in service firms?

Innovation starts with the decision whether to work out an idea. Within small service firms, decision-making is mainly the role of general management, sometimes by marketing and R&D, in some cases R&D receives a central role. Within large service firms responsibility shifts towards business unit managers mainly supported by marketing and sometimes supported by R&D and line management. In case a service firm delivers to customers (B2C and B2C/B2B) suppliers are additionally involved within the decision-making process, in case of business to business delivery the role of the supplier decreases.

With regard to resources, most service firms make primarily use of flexible intern innovation budgets. There are some firms with fixed budgets, marketing budgets or contribution of suppliers as well, however these are a minority. Nevertheless, in case of the fixed budgets it is worth mentioning that 66% of the full service firms assigned a fixed budget against 17% of the other firms. In case of grant possibilities, one service firm used a national grant. European, regional or local grants are not mentioned. A minority of service firms, working on process and recombinatorial innovations received financial resources from a source not included in our survey.

Financial resources are principally expended to own staff, IT services and external advice. While zooming in on these expenditures it becomes visible that most resources are spend on technological developments or application. Particularly mass services are active within this category and spend almost 50% of their innovation budgets on technological developments or applications. Furthermore knowledge development, concept design and marketing programs are important elements. Training and coaching is most likely within firms who worked on marketing innovations and least during recombinatorial innovation. Within this formal category firms spend more on competence development, which is less

visible in other innovation categories. Compared to large firms, small firms spend less on organizational development.

Within most service firms, innovation is part of an ongoing program. With exception of some installation firms, most service firms do not assign a special innovation theme or formulate and present goals in regard to their innovation activities. General management is principally responsible in relation to innovation within service firms, closely followed by business development and business unit managers. The larger the firm, the more important the role of the business unit manager becomes. At the launch phase, business unit managers are often assisted by marketing managers. Purchase managers are not mentioned as a responsible profession at all.

The role of top management within the innovation process is big within all service firms. All selected criteria received a high score. In particular, regular involvement and frequent flows of information concerning progress are important items with regard to top management involvement.

While concentrating on the role of customers, it becomes visible that improvement of ideas, evaluation, idea testing and market introduction the most important stages. Customer roles during actual development differ, both large and small service firms incorporate their customers within their design stage. However, only large firms assign a big role. Customers are not involved during the mobilization and allocation of financial resources.

Business development, sales, R&D and back office staff are most of the times involved within an innovation team. With exception of marketing innovations in which the R&D department is never involved. Purchase departments are only involved within the innovation teams of mass services. HRM and finance are mostly incorporated within innovation trajectories of B2C firms, while they are not incorporated in firms serving other customer types. Back-office service staff is chiefly involved within mass services, front-office service staff is primarily involved within full service firms. Principally, innovation teams within large service firms experience pressure of time during their innovation activities. Furthermore, innovation teams are harmed by standard operating procedures. In regard to available resources the least resources are available during recombinative trajectories. However, most innovation teams are capable to impact the approach of the innovation process and able to set their own priorities.

Concentrating on the test and launch phase of an innovation process, we can conclude that generally taken, employees are well informed and able to provide feedback before the actual launch of the innovation. However, there are some improvement possibilities concerning product/service innovations. Referring to test results, service shops indicated enough motivation for improvement based on their results, mass service indicated the least improvement triggers. Finally, in relation to protection 53% of the innovations are protected this number seems high, however it incorporates a large amount of short-time to the market and secrecy.

Relation between management of innovation in service firms, service characteristics and firm characteristics

In the end, the primary goal of this report was to design a service typology based on management, service characteristics and firm characteristics. We have seen all kind of differences between the different contextual characteristics of service firms (size, service description, innovation, service percentage of annual turnover and customers served). Within the last section of this report we zoom in on the characteristics of services in its essence one more time to see whether there are variations visible on the service characteristics level.

Based on the results of the chi-square tests presented in the analysis section (Figure 18) indicating significant differences on capital intensive-labour intensive, standardization-customization and low skilled-high skilled. We can write the following conclusions: Professional and installation services are mainly labour intensive while mass and shop services use both labour and capital intensive. Professionals deliver customized services while mass firms on the other extreme deliver standardized services. Installation and shop firms make use of both service types while installation services focus more on customization and shop services focus primarily on standardization. Professionals make principal use of high skilled employees, Installation firms make use of high and middle skilled employees, mass services make use of a mix and shops make use of two extremes; high or low skilled employees. And that is exactly were found the crux, service typologies have never before been interpreted from the educational level of employees. While incorporating these characteristic in a model, the following picture can be drawn.

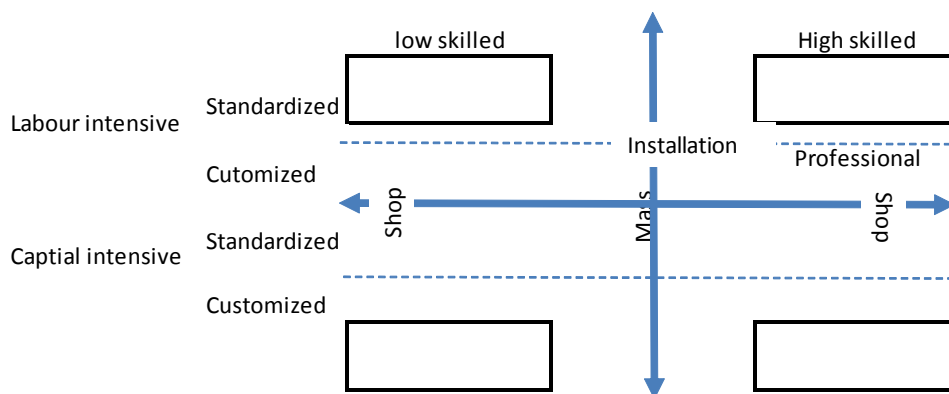


Figure 19: Low skilled/High skilled Service archetype, Nieuwenhuis, Vos, Flikkema and Spaargaren, 2010

Although, it was not possible to build a strong framework, due to a lack of data, we did find some evidence that the often cited framework of Silvestro et al. (1992) does not cover the whole service sector. Aiming at professional services, our results perfectly fit within Silvestro’s model, customized labour intensive service requiring high skilled employees. Pointing attention to mass firms, the standardization aspects fits the current model, the high labour intensity on the other hand does not. Mass services incorporated in our research make use of both capital as well as labour intensive activities. With regard to service shops we make us of the description of Verma (1998), since Silvestro et al. only

indicate a middle position without going in to detail. According to Verma (1998) service shops are characterized by low labour intensity and high customization. A service shop is able to provide varied customized services to its customers. Our service shop firms do not fit within this picture. Based on our data we can describe two types of service shops, high skilled service shops and low skilled service shops. While focusing on the examples of Verma (1998), auto and other repair services and hospitals these two types match the visible pattern. Within hospitals it is more likely to find large amounts of high skilled employees compared to repair centres. Furthermore, we tried to prove that a new type of service firm, is (re)entering the service management research field; “installation services”. We used the definition of Flikkema et al. (2010), installation services are characterized by customized services. Employees are low, middle or highly educated, although the customization is high, customers play a passive role during the service delivery process. This description fits within our model with exception of the educational levels. Installation firms never selected the low skilled option. Based on the proven service characteristic difference it is possible, although very small, to draw a distinction between professional and installation services, based on education level and standardization.

Finally, although the sample was too small to indicate real differences between the innovation types. This research provides evidence that it makes sense to use an additional innovation category, i.e., recombinatorial innovation. Further study is needed to fully test the final underlying assumption of our research outcomes; that the innovation processes of service firms is contingent upon their service characteristics and educational level of employees, which in their turn can be divided in archetypes; perhaps included with professional, installation, mass and shop services and type of innovation; process, product/service, recombinatorial and marketing innovation.

7. Limitations

Some limitations of the research will be addressed within this section of the report. First, two organizations have been involved in contacting firms directly related to innovation which may have created variance in the data. However, this cannot be checked with the data, although we believe that this is a likely scenario. Furthermore, the firm size variables may have been discriminated between the data since Syntens concentrates only on medium and small size firms. Second, there may be some limitations due to “success approach”, i.e., we only asked for successful innovations. Success and fail factors cannot be determined. Furthermore, we have asked for implemented innovations, which may cause a “halo effect bias” (Thorndike, 1920). Third, the dropout rates in relation to the survey are quite large. The web survey used within this research might have been too specified which resulted in a long list, respondents needed at least 30 minutes to complete the questionnaire. Fourth, the survey might not be suitable for small service firms, since some questions are really specific and detailed and incorporate items not included in a small firm. Fifth, although this research provides valuable information for directions of thought, the data available within our sample was too limited to build very strong statements. The Pearson Chi-square, statistics for example do not accomplish the basic requirements necessary to make the tests trustworthy. Sixth, we concentrated on the Dutch service industry and tried to create an atypical sample, representative for the Dutch service industry as a whole. Unfortunately, the number of respondents was too limited to draw valuable conclusion related to the service sectors. In order to overcome this problem, we used the size of the service firms.

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8. Appendix

a. Web survey