Strategic Study B200205

Innovation in service firms explored: what, how and why?

Literature review

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Zoetermeer, January, 2003

EIM
Business & Policy Research

ISBN: 90-371-0874-1
Order number: B200205
Price: € 30.-
This report is part of the research programme SMEs and Entrepreneurship, which is financed by the Netherlands Ministry of Economic Affairs.

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Contents

Abstract

Innovation in service firms is an important topic, not only for entrepreneurs but also for policy makers. Despite their economic importance, services have received relatively little attention in innovation research. A broad overview of the current insights in innovation in service firms is necessary. Therefore, EIM has executed a strategic study. It provides an overview of the most important findings in academic research: what innovation in services is about, the new service development (NSD) process, the antecedents of successful innovation, and the results of innovation in services.

When defining innovation in services, the usual distinction between product and process innovations does not apply. This is due to the often simultaneous production and consumption of services. Instead, innovative output in service firms can be characterised by changes in (1) the service concept, (2) client interface, (3) delivery systems and (4) technological options. Supplying examples for the extremes of these dimensions is difficult. In practice, new services are a mixture of these four dimensions.

The new service development (NSD) process tends to be informally organised. However, it can be structured as a two-stage process that differs markedly from the process of developing new products. It starts with the so-called search stage. This divergent stage focuses on gathering and selecting ideas. Activities that have to be performed include idea generation, screening and commercial evaluation. Then follows the implementation stage in which promising ideas are transformed into concrete results. This stage includes the development of a new or renewed service offering, testing and market launch.
All activities are not strictly carried out successively. Activities should be allowed to overlap in time.

Some antecedents of innovation success are closely related to the NSD process: people, structure, resources and networking. People are at the heart of successful NSD. The coworkers of a service firm have to generate innovative ideas, and develop, test and implement the new services. Other antecedents tend to create a firm climate that is supportive to innovation. One can distinguish between: culture and leadership, strategy and other company characteristics. Finally, part of the innovation success can be managed only in an indirect way or not at all. External conditions that affect the results of the NSD process include: market conditions, knowledge infrastructure and government policy.

Profit-seeking service firms invest efforts in innovation in the anticipation of economic rewards. The impact of innovative efforts can be threefold: financial benefits, increased customer value and strategic success. Besides, innovation in services can result in changing market conditions. There is no doubt that when a new service proves to be successful in a particular sector, other service firms will follow.

Preface

The services sector is becoming increasingly important for economic development in many countries. Services offer an important contribution to economic growth and employment. Because innovation is among the key drivers of growth and development, innovation in service firms has become an important topic for policy makers. Service managers will be interested in the subject of innovation as well, because it provides them with opportunities to increase their firms' performance.
The subject of innovation in services is not yet fully integrated into the scientific management literature. A broad overview of the current insights in innovation in service firms is necessary, and this study attempts to fill this gap. It aims to define innovation in service firms, the new service development process, to provide an overview of the antecedents of success, and to discuss its results.
Various persons have contributed significantly to this study. First, I thank my colleagues Joris Meijaard (EIM), Anne Bruins (EIM) and Wilfred Dolfsma (Erasmus University) for their help on reading the literature and writing this report. Also Bas Ouwerling (Erasmus University) must be mentioned. He made a substantial contribution to this project as an apprentice. Moreover, I would like to thank the members of the review panel: Teun Wolters (Statistics Netherlands), Gerhard Meinen (Statistics Netherlands), Frans Suijker (CPB), Machiel van Dijk (CPB) and Yvonne Prince (EIM). I greatly appreciated their comments on the previous versions of this report. Finally, I would like to thank every one who invested their time in this study for an interview.

Zoetermeer, December 2002

Jeroen de Jong

1 Introduction

1.1 Motivation

Importance of the service sector

For a long time service firms were not considered to be innovative. Major changes seemed to be invisible and certainly not worth the qualification 'innovation'. Services, however, constitute a major part of total economic activity and employment in most economies and offer an important contribution to economic growth and employment. It is well-known that in the advanced economies of the OECD, services account for roughly two-thirds of value added, a share that is still growing, whereas that of manufacturing is in decline (OECD 2000; Anxo and Storrie, 2001; Kox, 2002).
In the Netherlands, also the services sector is growing fast while productivity growth is stagnating (Kox, 2000). It is becoming clear that a large share of innovative efforts in business is related to the development of new services (OECD, 2000; Suijker *et al.,* 2002; Howells, 2000). However, there is, as yet, little knowledge about innovation in service firms (Menor, 2000). Despite their economic importance, services have received relatively little attention in innovation research. The subject has long been discarded in favour of technological innovation, which is particularly relevant for manufacturing industries (Meyer and DeTore, 1999; Johnson *et al.*, 1999). An ad hoc approach has traditionally dominated the new service development (NSD) process (Shostack, 1984; Johne and Storey, 1998).

Overview of current insights

During the last decade, the analysis of innovation in services progressed remarkably (Den Hertog, 2000). It was recognized that service firms are not merely passive recipients of manufacturers' innovations (Barras, 1986; Barras, 1990), and the emphasis on technological innovation was somewhat moderated by the recognition of the importance of non-technological elements of innovation in service firms. It became clear that apart from technological capabilities, human and organizational capabilities are also important.
Compared to manufacturing, innovation in services is not yet fully integrated into academic literature (Menor, 2000). A broad overview of the current insights in innovation in service firms is necessary. This is relevant for anyone who is interested in having an overview of what innovation in service firms is about. For instance, our findings may provide useful insights for students, service entrepreneurs and managers, and business consultants.
Therefore, EIM has executed a strategic study. It provides an overview of the most important findings in academic research: what innovation in services is about, the new service development (NSD) process, the antecedents of successful innovation, and the results of innovation in services.

1.2 Research questions, methodology and limitations

Research questions

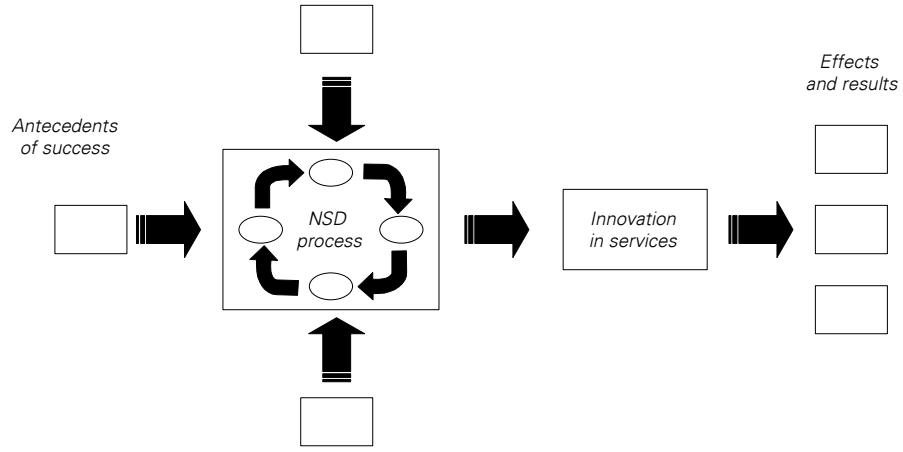
As stated, the importance of service industries for the national economy is increasing, and many service firms will be interested in how they can improve the effectiveness and the efficiency of the new service development (NSD) process. This study aims to describe innovation in service firms, to increase the insight in the NSD process, to provide

an overview of the antecedents of success, and to discuss the results of innovation in service firms. We shall answer four research questions:

1 What are innovations in service firms? How can they be described?
2 How are innovations in service firms developed? What does the new service development (NSD) process look like?
3 What are the antecedents of successful innovation in service firms?
4 What are the results of innovation in service firms?

By answering these research questions we will be able to adequately explore what innovation in service firms is about. The relationships between our research questions are made clear in figure 1. This figure integrates the various subjects of our study.

figure 1 Relationships between the research questions



Methodology

The research consisted of three activities: literature research, interviews with experts and writing this report.

Brown and Eisenhardt (1995) discuss two complementary traditions in innovation research: the economics-oriented and the business-oriented tradition. The literature in this review is chosen/taken from both traditions of innovation research. The first tradition is economics-oriented. It examines differences in the patterns of innovation across countries and industrial sectors, the evolution of particular technologies over time, and intra-sector differences in the propensity of companies to innovate. The level of analysis is at the macro or meso level. However, in this research tradition, the actual service development process remains a black box.

The second research tradition, which is business-oriented, opens up that black box. It examines how specific new services are developed, and indicates the organizational structures, roles and processes that are related to enhanced service development. The entrepreneurs and the innovations are placed in the centre of the analysis.

It should be noted that, in reality, the difference between the traditions is not as distinct as Brown and Eisenhardt (1995) suggest. Recently, researchers have started to pay attention to both traditions (e.g., De Jong and Kemp, 2001; De Brentani, 2001). The literature in this review is picked partly from the economics-oriented tradition (mainly to answer research questions 1 and 4) and partly from the business-oriented tradition (to investigate research questions 2 and 3).

Apart from literature research, we interviewed a number of experts in the field of innovation in services. We spoke to scientists from universities and research agencies to pro-

vide us with relevant names of (foreign) researchers, relevant journals, but also for feedback on our preliminary results[1]. After the literature search was completed, we summarized our findings in a conceptual framework to describe innovation in service industries. The first versions of this framework were discussed with our review panel. Their feedback caused us to adjust and further refine the conceptual framework, which will be presented in chapter 6. Our activities have resulted in a state-of-the-art overview of the literature on innovation in services. This report presents our findings.

Limitation: no differences between sectors

Beforehand, we stress that this study has an important limitation. We do not account for differences between various service sectors. At this moment, this is almost impossible because it is only in recent years that academic researchers have begun to address issues concerned with the development of the very wide span of services offered today (Johne and Storey, 1998). The services sector ranges from technology- and skills-intensive sectors such as software, computer and business services, to low-technology and low-skilled sectors that make up a large part of personal services (Suijker *et al.*, 2002). Thus, a wide range of subsectors can be distinguished. The Dutch Chamber of Commerce and Manufacturing (1997), for instance, uses a classification including:

- Wholesale
- Retail
- Transport and communication
- Business services
- Financial services
- Hotels and restaurants
- Personal services.

We intend to provide a general overview of what innovation in services is about. However, one should be aware that our research questions can be answered in even more detail, depending on what kind of service industry one is thinking of.
In practice, by far the greatest bulk of literature focuses on financial, business and transport service firms. For the other sectors (retail, wholesale, hotels and restaurants, and personal services), the amount of research is still quite minimal. The question is to what extent our results are valid for these sectors. Future research should focus on this.

1.3 Content of this report

In chapter 2, we aim to describe what innovation in service firms is about. We focus on our first research question by presenting some definitions and typologies of innovation in services. First, we discuss the differences between services and (manufactured) products. Second, it appears that innovation in service firms can be characterised by four dimensions: changes in the service concept, client interface, delivery systems and technological options. Besides, innovation in services can be initiated by various actors, such as clients, suppliers and the service firm itself.
Chapter 3 takes a thorough look at the new service development (NSD) process. It will provide answers to our second research question. In service firms, NSD tends not to be formally organized: mostly it is an ad hoc process. We survey a number of models that

[1] We wish to thank dr. W. van der Aa, dr. P. Vermeulen (Erasmus University Rotterdam), prof. dr. T. Elfring (Free University Amsterdam), drs. P. den Hertog (Dialogic innovation & interaction) and dr. P. van Hoesel (EIM) for their suggestions and comments.

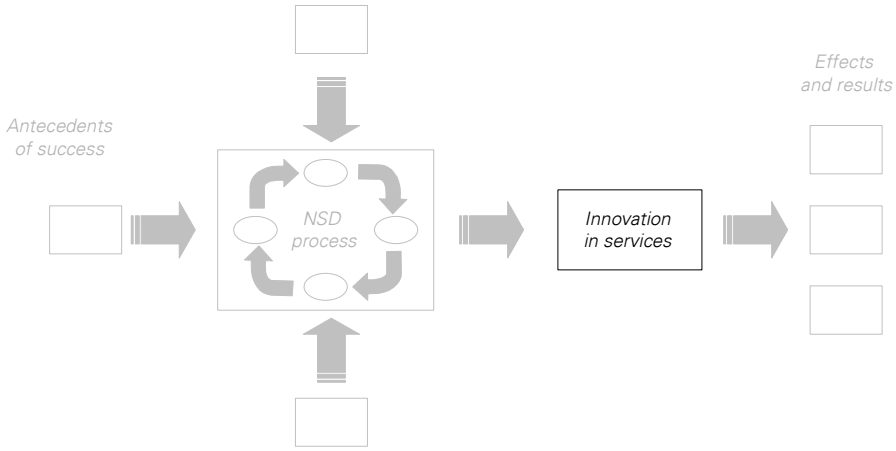
stem from new product-development literature (context of manufacturing), and make an inventory of their benefits to propose a model for NSD. This model consists of a search stage in which ideas are gathered and screened, and a development stage in which promising ideas are transformed into new services.
Chapter 4 reveals the antecedents of successful innovation (cf. our third research question). It appears that the antecedents are threefold. Some of them are directly related to the activities in the NSD process (such as available resources), others tend to create an internal climate that is supportive to innovation (such as culture and leadership), and some of them are external conditions which are not directly manageable (such as market conditions and the knowledge infrastructure).
In chapter 5, we reveal the results and the effects of innovation in services. These provide answers to our fourth research question. We discuss the results for the service firm (which consist of financial gains, customer value and strategic success), but also focus on the effects of innovation in services at the market level.
Chapter 6 ends with an overview of our findings. We have constructed a conceptual model to describe innovation in services. We use this to summarise our findings and provide answers to our research questions. In addition, limitations and suggestions for future research are discussed.

2 Definitions and typologies

2.1 Introduction

Before we start our discussion on the process of new service development (NSD) and its antecedents, it will be useful to define our terms. What exactly is a service? What do we mean by innovation in service firms? What are the main differences with 'traditional' innovation in manufacturing? And what types of innovation in service firms can be distinguished? This chapter takes a close look at services in general and innovation in service firms in particular (figure 2).

figure 2 Content of this chapter



Section 2.2 first presents some definitions and major characteristics of services. We shall also discuss the differences between services and (manufactured) goods. Section 2.3 discusses what service innovation is about. In addition to its definition and its differences with manufacturing, we shall discuss four dimensions used to describe innovation in services: the service concept, client interface, delivery system and technological options. Section 2.4 presents a typology of the various types of innovation one can distinguish in service firms. Innovation can be triggered by various actors: clients, suppliers and/or the service firms themselves. In section 2.5 we end with a typology to characterize sectoral differences in innovation types. In some service sectors innovation is usually supplier-dominated while in others innovation has a continuous character.

2.2 What is a service?

Some definitions

Services can be described and classified in several ways. Consumers (usually) pay in advance for something which they hope to receive, meaning that services are, to a large extent, based on trust. For instance, a tourist expects that his/her ticket, which has already been paid for, will actually give him/her access to the plane and if for any reason something goes wrong he/she expects that the insurance company will compensate him/her for the loss. According to Cook *et al.* (1999), no single definition of a service is capable of encompassing the full diversity of services and complex attributes that accompany them. In practice, we find a wide range of definitions. A service can be defined as:

– … an activity or series of activities of more or less intangible nature that normally, but not necessarily, take place in interactions between the customer and service employees and/or physical resources and/or systems of the service provider, which are provided as solutions for customer problems (Grönroos, 1990).
– … any act or performance that one party can offer to another that is essentially intangible and does not result in the ownership of anything (Kotler, 1994).
– … the delivery of help, utility or care, and experience, information or other intellectual content - and the majority of the value is intangible rather than residing in any physical product (DISR, 1999).
– … to organise 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, organisational) at the disposal of a client to organise a solution, which may be given to varying degrees of precision (Gadrey *et al.*, 1995).

With respect to these definitions, we conclude that a service is then only a service when it is being delivered. Moreover, we conclude that services have some distinguishing characteristics. Services are intangible, simultaneously produced and consumed, and often customized to a client's needs.

Differences between services and products

The differences between products and services have been the subject of debate for some time (e.g., Vermeulen, 2002; Ennew *et al.*, 1992; Levitt, 1981; Zeithaml, 1981). There are some researchers who claim that the differences can be ignored (e.g., Gallouj and Weinstein, 1997). However, the majority of researchers specify the characteristic features of services as opposed to a manufactured product. Vermeulen (2001) discusses four of those features: intangibility, simultaneity, heterogeneity and perishability (table 1)[1].

table 1 Differences between services and products

Services tend to be	*Products tend to be*
– Intangible	– Tangible
– Simultaneous production and consumption: customers participate in production	– Separation of production and consumption: customers do not normally participate in production
– Heterogeneous	– Homogeneous
– Perishable: cannot be kept in stock	– Can be kept in stock

Source: Vermeulen, 2001.

Below we discuss these features in detail. However, we first stress that the differences between products and services are not absolute ('black and white'), but more of a gradual nature. So services tend to be more intangible, simultaneous, heterogeneous and perishable than manufactured products, but this is not always the case.

Intangibility. Services tend to be intangible (e.g., De Brentani, 1991; Kotler, 1994; Elfring, 1997; Van der Aa, 2000; Hulshoff *et al.*, 1998; Avlonitis *et al.*, 2001; Bernardt, 2000; Johne and Storey, 1998). It seems this is the only feature common to all services. In fact, intangibility best differentiates services from manufactured products. Because of

[1] For an overview of alternative ways to classify services, see Grönroos (1990).

their intangible nature, customers do not know exactly what they purchase; there is no transfer of ownership. Services can be seen as performances instead of objects, because they cannot be seen or touched (Zeithaml, 1981).
The degree of intangibility will, however, differ between services. However, tangible elements (for instance, credit cards in financial services) can accompany services. Most services contain a mix of tangible and intangible attributes that constitute a service package (Chase *et al.*, 1998).

Simultaneity. The second feature of services is the simultaneity of production and consumption (e.g., Zeithaml, 1981; De Brentani, 1991; Van der Aa, 2000; Hulshoff *et al.*, 1998; Bernardt, 2000; Johne and Storey, 1998). This means that services are produced and consumed in the presence of customers or 'require substantial interaction' (Cooper and De Brentani, 1991). This differs from products that are first produced, then sold and finally consumed. In producing services, the customer takes part in the production process, while this is rarely the case in manufacturing.
The degree of overlap between production and consumption varies from service to service. Many financial services show only a small degree of overlap in production and consumption. For instance, mortgage or life insurances are produced in interaction with the customer, but once a contract has been signed, the actual consumption lacks substantial interaction.
Generally speaking, the greater the percentage of contact time between the service provider and the customer the greater the degree of interaction between the two during the production process. Service systems with a high degree of customer contact are more difficult to control and more difficult to manage. In intensive contacts, the customer can affect the time of demand, the exact nature of the service, and the quality or perceived quality of the service because the customer is involved in the process (Chase *et al.*, 1998; Avlonitis *et al.*, 2001).

Heterogeneity. Heterogeneity is concerned with the variability of services. Gadrey *et al.* (1995) state that the customized aspect is more significant in services than in manufacturing goods. According to several researchers (e.g. De Brentani, 1991; Kotler, 1994) various deliveries of one particular service differ substantially because of the personal perceptions of clients.
Various reasons for these differences can be pointed out. De Brentani (1989) argues that the degree of heterogeneity depends on whether the service is people- or equipment-based. The role of company personnel is often crucial as they 'deliver' the service to the customer in people-based services. Front-line employees are often unable to standardize the output (the actual service). However, a cash machine (ATM), as an equipment-based service, is able to provide exactly the same service over and over again. Customers will perceive this type of service as less heterogeneous. On the other hand, if people go to a bank and have to wait a long time before getting served, this will increase their level of irritation and influence their perception of the quality provided.

Perishability. The final feature Vermeulen (2001) discusses is the perishability of services. Services that are available but are not being consumed, cannot be stored (Zeithaml, 1981; De Brentani, 1989; Van der Aa, 2000; Johne and Storey, 1998). Production and consumption of services are mostly bound to time and place and take place near the customer. Because services cannot be stored, it can be difficult to synchronize supply and demand. In transport services, the available seats in a plane might not all be filled, which means that all the empty seats are 'lost'; they cannot be used as a buffer for a period of high demand. One should be aware that perishability does not apply to

all services. For instance, computer software is not perishable. Below we shall elaborate on this.

Some remarks on the differences between services and products

In actual practice, products and services cannot be distinguished as clearly as discussed above. Easingwood (1986) argues that 'not all services are intangible, produced simultaneously, heterogeneous, and perishable, and manufactured goods may possess one or more of these characteristics as well'. For instance, in transport services, travel documents and (insurance-)policy conditions can be thought of as the physical parts of the service. Another example is the effect of information technology (IT) on the delivery of services. Software service providers tend to offer homogeneous products which are not produced and consumed simultaneously. Moreover, in manufacturing most products are increasingly accompanied by additional services, think for instance of repair and maintenance services.

All in all, it is more useful to think about services and physical products as the extremes on a continuum (Johne and Storey, 1998). In this study we focus on the rather extreme case in which the characteristics of services apply to a large extent.

Looking at the great number of studies which stress the specific characteristics of services as compared with products, it seems inevitable to develop a specific approach to service innovations. It is not surprising that the number of researchers who see no need for a specific approach to service innovation is rather limited (e.g., Gallouj and Weinstein, 1997). However, we should not completely discard the insights from innovation in manufacturing. As products and services can be considered to be opposites on a continuum, certainly not all research findings from manufacturing contexts will be inapplicable. Therefore, in this study we shall adjust insights from innovation in manufacturing if relevant and necessary.

2.3 What is innovation in services?

Most researchers agree that innovation in service firms has a different character than in manufacturing (e.g., Bernardt, 2000; OECD, 2000; Johne and Storey, 1998). Innovations in service industries are often non-technological. They mostly involve small and incremental changes in processes and procedures. Many service innovations are not very radical and have often already been implemented in or by other service organisations. In table 2 we have listed some more differences between innovation in service and manufacturing firms.

table 2 Some examples of differences between innovation in service and manufacturing industries

Source	*Differences with manufacturing*
Brouwer (1997)	Service innovations do not require much R&D. Service firms tend to invest less in fixed assets to support innovations. Service firms spend less money on buying patents and licences.
Ebling *et al.* (1999)	In the services sector a lower percentage of revenues is invested in innovation.
Atuahene-Gima (1996)	Service innovations are more easy to imitate. An explicit human resources strategy has a larger influence on the success of new services than on new manufactured products.
Cooper and De Brentani (1991)	Technology is less important for new service development (NSD).

Source	*Differences with manufacturing*
OECD (2000)	Service innovation is not limited to changes in the product's characteristics. It usually involves changes in the delivery process and client interface as well.
Sirilli and Evangelista (1998)	A lack of well-educated co-workers is a main barrier to innovation in service firms, more often than in manufacturing. Organizational problems often prevent new services from being successful; organizational aspects fulfil a key role.

Source: Ouwerling (2002).

Definition

What do we mean by innovation in services? Again, literature reveals several definitions. Innovation in services is:

- … the development of service products which are new to the supplier (Johne and Storey, 1998).
- … an offering not previously available to a firm's customers resulting from additions to or changes in the service concept (Menor *et al.*, 2002).
- … encompassing ideas, practices or objects which are new to the organisation and to the relevant environment, that is to say to the reference groups of that innovator (Van der Aa and Elfring, 2002).

Like innovation in manufacturing, innovation in services is essentially about change and renewal. Because of the differences described in section 2.2, it is broadly accepted that the usual dimensions to describe innovation, which stem from manufacturing, are not fully applicable in a service context (Tidd *et al.*, 2001). To further characterize service innovation, we shall discuss some of the main differences with innovation in manufacturing. This discussion includes the:

- object of innovation,
- degree of novelty and
- dimension of newness.

Object of innovation. In manufacturing, innovation can be classified by two basic forms: changes in the things (products, goods) which an organization offers, and changes in the ways in which they are created and delivered. Traditionally, these changes are termed as 'product' and 'process' innovation (Tidd *et al.*, 2001).
In services, the dividing line between product and process innovation tends to be blurred (Bitran and Pedrosa, 1998). For example, a new jet-powered sea ferry is both a product and process innovation. Because of the simultaneity of services, product- and process innovations usually coincide. New services often go together with new patterns of distribution, client interaction, quality control and assurance, etc. But there are huge differences in the specific patterns involved: what is important for introducing one new service into the market might be totally irrelevant for others. Later in this section, we discuss four dimensions of innovation in services.

Degree of novelty. Service innovation involves the creation and introduction of a new offering or delivery process. An innovation can be viewed in terms of the degree of novelty, ranging from a totally new, discontinuous innovation to a service involving simple line extensions or minor adaptations/adjustments that are of an evolutionary nature.
As in manufacturing, the degree of novelty can be applied to characterize service innovations (Hulshoff *et al.*, 1998). Radical innovations and incremental new services repre-

sent opposite ends of the newness spectrum (this could be interpreted as the difference between revolution and evolution):

– Radical/revolution: The complete system of characteristics and competences that make up a service is replaced by another system of characteristics and competences, or a completely new service is introduced, causing the old service to vanish.
– Incremental/evolution: Characteristics are replaced or added without changing the service essentially, the service is changed marginally only. This can entail new elements that were previously not perceived, encountered or utilized by customers. This could also include developing a solution for a specific problem in cooperation with the client.

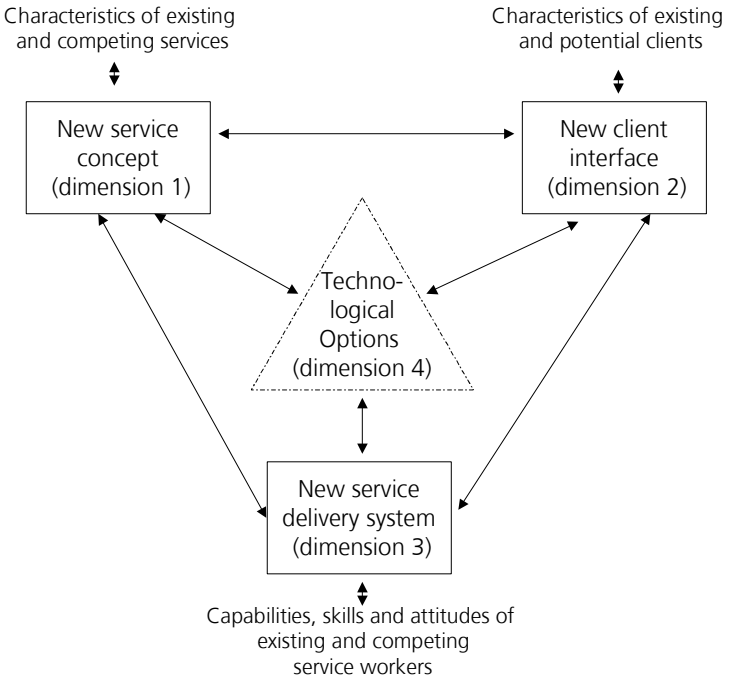
One should bear in mind that the degree of novelty will coincide with different types of innovation processes. We expect that radical innovations are usually developed in large-scale, formally managed processes that look almost the same as R&D projects in manufacturing (with project teams who are responsible for the development efforts, separated from the regular work processes). On the contrary, incremental innovations are expected to be developed by means of a less formalised approach, with co-workers who work on their usual tasks and the development of innovative ideas alternately. Of course, service innovations with a low degree of novelty are far more widespread than radical service innovations.

Dimension of newness. Apart from the degree of novelty, innovations can be described along several dimensions of newness, the most common of which include measures of newness to the developing firm, to the outside world or to both of these (Booz *et al.*, 1982).
First, a service innovation can be new to the developing firm. In this case, a new service exploits a service concept which already existed elsewhere, but is totally new to the developing firm. On the contrary, a service innovation can be new to the outside world. In this case, newness refers to the perception by new customers and/or competitors who are confronted with previously unfamiliar offerings.
De Brentani (2001) concludes that in innovation in services, both dimensions of newness tend to go hand in hand (more often than in manufacturing). This is because service managers who want to improve innovation success realize that both dimensions must be taken into account simultaneously.

Four dimensions of innovation in services

In practice, most innovations appear to be a mixture of major and minor changes and adaptations of existing services. As mentioned above, the distinction in product- and process innovations is less suitable to adequately describe innovation in services. These innovations are rarely limited to a change in the characteristics of the service offering itself. Research shows that four dimensions can be used to describe a new service: the service concept, the client interface, the service delivery system and technological options (Den Hertog, 2000; Bilderbeek *et al.*, 1998). These dimensions appear to be useful to describe the diversity of innovation in services (figure 3).

figure 3 Four dimensions of innovation in services



Source: Adapted from Den Hertog (2000).

Service concept. Innovation in the new service concept is the first dimension of innovation in services (Cook *et al.*, 1999; Den Hertog, 2000; Avlonitis *et al.*, 2001). It relates to the content and characteristics of the new or renewed service (cf. Lancaster, 1966). Manufactured products (and processes) are typically highly tangible and visible. Services involve more intangible characteristics. A new service concept can include new combinations of existing service activities (e.g. Van der Aa and Elfring, 2002).
Service firms often choose for changes in the service concept to imitate innovations by competitors. They are an important source of adaptations (Easingwood, 1986): the characteristics of existing and competing services cause service firms to make adjustments in the service concept.
Some examples of innovations with a new service concept include:

– call centre services. These service firms install, organise and recruit staff for their clients' call centres - which have emerged from temporary staffing offices.
– software and ICT services. These service firms originally stem from manufacturing companies that offered mainframe and personal computers.

Client interface. Innovation in the client interface is the second dimension of innovation in services (Chase *et al.*, 1998; Den Hertog, 2000). The client interface is the focus of many service innovations. Service offerings are increasingly marketed and produced in a client-specific way (even with client-specific pricing). Often, the characteristics and desires of existing and potential clients tempt a service firm to make adjustments in the client interface. This dimension of innovation can even entail clients acting as co-producers of the service offering (e.g., Van der Aa and Elfring, 2002).
Examples of innovations that entail changes in the client interface include:

– electronic data interchange (EDI), which represents an effort to establish common formats for electronic documents that allow for a wide range of interactions to be partially automated - including various elements of design as well as ordering and invoicing.

– the delivery of database products (for instance, the Yellow Pages) by means of the Internet instead of via a hardcopy.

Service delivery system. The third dimension consists of adjustments in the service delivery system (e.g., Cook *et al.*, 1999; Gadrey *et al.*, 1995; Den Hertog, 2000; Avlonitis *et al.*, 2001). It refers to the internal organizational arrangements that have to be managed to allow service workers to perform their job properly, and to develop and offer innovative services. The service delivery system facilitates them so that they can perform their jobs and deliver service products adequately. It could be interpreted as the internal work processes and arrangements.
This type of change is often the direct result by the preceding ones (the linkage between the service provider and its client, and/or the service concept). Also, the capabilities, skills and attitudes of existing co-workers can make any necessary adjustments in the service delivery.
One example of innovation that led to changes in the delivery system is the introduction of e-commerce. This may require serious business process re-engineering. E-commerce may have a substantial impact not only on the way in which the actual commercial transactions occur, but also on the processes preceding and following the transaction.

Technological options. The fourth dimension (technological options) is the centre of much analysis and debate (e.g., Kandampully, 2002). It is clear that service innovation is possible without technological innovation; technology is not always a dimension. Nonetheless, in practice, there is a wide range of relationships between technology and innovation in services. Changes in technological options may be forced by changes in the dimensions discussed above. On the other hand, technology can play a role as a facilitating or enabling factor. Although IT is certainly not the only relevant technology in service innovation, it is an example that is relevant in many innovations in services (Bruins and De Jong, 2000). IT is often perceived as the great enabler of service innovation. In this context, Van der Aa and Elfring (2002) describe technological innovations as the development and implementation of new forms of technology and related reconfigurations of service concepts and processes.
Examples of innovations with a strong technological component include:
– financial service firms that increasingly sell insurances via Internet, enabled by IT.
– tracking and tracing systems, enabling transport service providers to monitor the progress of their fleet and thus to manage their transport services more closely.

Relationships between the four dimensions

Supplying real-life pure examples for these dimensions described above proves difficult. Den Hertog (2000) rightfully observes, 'any service innovation involves some combination of the (four) dimensions of service innovation'. In practice, new services are thus a mixture of the four types, which are more like ideal types that help one understand developments in the real world. Apart from a new service concept, a completely new service will usually mean that employees will have to change the way they work (delivery system), relate to customers (client interface), and the way technology is used in business processes (technological options).
A particular service innovation may display a dominant feature related to one of the four dimensions (see, for instance, the examples mentioned above). If and when service providers aim for advantages such as cost efficiency, quality control, etc. - the fourth source for innovation becomes more important. Quite likely, this particular feature will cause a set of changes in other dimensions, in order to bring about a successful innovation (indicated by the arrows in figure 3).

2.4 A typology of innovations

Initiated by various actors

How are innovations in services initiated? They can be triggered by various actors, such as clients, suppliers or the service firm itself. In innovation processes their role can be diverse. Below, we shall elaborate on this, and present a typology of innovations based on the different weights of their roles.

Role of clients. In general it is clear that the client plays an important role in the development of new services (Kline and Rosenberg, 1986; De Brentani, 2001). The desires of clients tempt a service firm to make adjustments in their service offerings. According to Barras (1986; 1990), when service firms become more innovative, they tend to offer more radical services. Within individual companies, the services are increasingly tailored to individual customers (another service or manufacturing firm in the case of intermediate products, or final users).

Role of suppliers. Suppliers fulfil a key role in many innovations in service firms (Barras, 1986; Barras, 1990). Particularly in small service firms, innovation is initiated by suppliers. Many service firms adopt for their own use technologies developed elsewhere (Pavitt, 1984). An example is the use of software applications in administrative services. This type of innovation has an incremental nature. It aims at the improvement of service efficiency.

Role of the service firm. Service firms can initiate new service development themselves. They can do this for various reasons. Some of these were discussed in the previous section, such as the desire to imitate innovations by competitors (e.g., Easingwood, 1986; Hooley and Mann, 1988), or the skills of co-workers that make adjustments in the service delivery system necessary (Den Hertog, 2000). Others just 'are on earth' to be innovative, it is their mission (Van der Aa, 2000). Of course, eventually, service firms are motivated by economic gains (Johne and Storey, 1998).

The role of clients, suppliers and the service firm itself are helpful in distinguishing various outcomes of the innovation process in service firms. Den Hertog (2000) presents a typology of five types of innovation, in each of which these actors play a different role:

1 Supplier-dominated innovation
2 Innovation within services
3 Client-led innovation
4 Innovation through services
5 Paradigmatic innovation.

Innovations in service firms can be characterised as being one of these five types. They can be described by their linkages with the three types of actors. In table 3, their roles are summarised.

table 3 Five types of innovation in services

Type	*Role of supplier*	*Role of service firm*	*Role of client*
1: Supplier-dominated innovation	– Development	– Implementation	– User
2: Innovation within services	– Delivery of inputs	– Development – Implementation	– User
3: Client-led innovation	– Delivery of inputs	– Development – Implementation	– User – Initial motivator

Type	*Role of supplier*	*Role of service firm*	*Role of client*
4: Innovation through services	– Delivery of inputs	– Co-development	– Co-development – Implementation
5: Paradigmatic innovation	– Delivery of inputs – Co-development	– Co-development – Implementation	– Co-development – User

Source: Adapted from Den Hertog (2000).

Going from type 1 to 4, the influence of the client firm or final consumer on the innovation process gradually increases. Type 5 represents a somewhat different situation as all actors in the value system contribute to a particular innovation or are forced to accommodate it.

1. Supplier-dominated innovation. This type is often considered to be the dominant type of innovation in services (e.g., Barras, 1986; Pavitt, 1984). In general, this type of innovation is initiated by manufacturing industries. Innovations from external suppliers are disseminated and implemented by service industry users who, in their turn, satisfy the needs of their clients. Examples of this type of innovation include:
– microwave ovens in catering, whose introduction has greatly extended the possibilities for food preparation (and reheating) in cafés and restaurants;
– cash registers and mobile phones that have been assimilated into many small firms.

Typical for a supplier-dominated innovation is, at least initially, little scope for user industries to influence the actual product delivered by the supplier. The adopting firm often has to bring about some organisational changes in order to be able to use the innovation - to adapt its organisation, train its employees, etc. - and to offer more efficient and higher quality services as a result. Many IT-based innovations can be considered to be supplier-dominated. Referring to our discussion in section 2.3, changes in technological options will often be part of this type of innovation.

2. Innovation within services. In this type, the actual innovation and implementation take place in the service firm itself. Innovation within services is often induced by strategic considerations. Such innovations may be technological, non-technological or (as in many cases) a combination of the two. Typical examples of this type involve a new product or delivery system that is developed by the service firm itself and implemented throughout the organisation, possibly with innovation support from outside. Some examples:
– the introduction of a new shop formula in a retail firm
– new pension and saving schemes in financial services.

3. Client-led innovation. In this case, the service firm is responding to needs clearly articulated by its clients. Although, in a sense, every successful innovation is a reaction to a perceived market need, for some service innovations, this is more clear-cut than for others. Some examples:
– door-to-door public transport services aimed at the business traveller, a clear answer to the often-heard complaint 'we would like to use public transport (the train) more often, but that pre- and post-train transport is too time consuming';
– green banking services, to appeal to a growing number of individuals who want to invest their (saved) money in a 'socially responsible' way.

In these cases, the demands are expressed by segments of mass markets. In many other cases, the influence may come from a single client, which is often the case in business

services: for instance, a client may propose that a training firm offers a particular workshop.

4. Innovation through services. This more complicated type of innovation is found mostly in business-to-business service industries. In this type, service firms influence the innovation process taking place within the client firm. The service firm may provide knowledge and/or resources that support the innovation process in various ways. Despite these inputs much, if not all, of the innovation process takes place at the client's site.
Some examples:

- A consulting firm providing a client's project manager with the necessary skills to implement a new IT-application.
- An engineering firm supporting an oil and gas company that wants to drill and explore in a 'protected' area, helping them to find new operational methods to meet the strict environment-protection rules.

5. Paradigmatic innovation. A fifth and final type of innovation affects all actors in a value chain, and can thus be called a paradigmatic innovation. It involves complex and pervasive innovations affecting suppliers, customers and the service firm itself. When driven by fundamentally new technologies, such innovations are labelled technological revolutions or new technology systems. But they may also be driven by regulations, resource constraints, and other dramatic changes that require innovation to take place across many elements of the value chain, implying completely new infrastructures, new types of knowledge and adaptation on the part of intermediate and final users.
For example, if in a very densely populated area, the regular transport of goods is no longer possible and the decision to switch to underground transport was taken, parties across the whole value chain would have to innovate and change practices. Manufacturers of transport equipment would have to provide completely new transport equipment; transport companies would have to change their service offerings, retrain their personnel, market their product in different ways; users would have to change their behaviour and use of transport facilities.

Some final remarks. Den Hertog (2000) stresses that the typology discussed above is unlikely to be exhaustive. When taking new variables into account, more innovation types might be identified. We would like to add that in the real world the distinction between various types can easily be blurred. For instance, it will sometimes be hard to distinguish 'innovation within services' from 'client-led innovation', since the main difference lies in the motivation of the service firm (whether it is initiated by clients or strategic considerations).
The typology presented above showed us that new services can be triggered by various actors, such as clients and suppliers. As yet, we have not discussed the innovation process itself. We shall focus on this in the next chapter.

2.5 Sectoral differences within the service sector

When looking at innovation in service firms, sectoral differences will be evident. This is because sectors differ greatly in their underlying technologies, available human resources, amount of competition, and bargaining power of clients. For example, designing and introducing a new way of public transport (such as the Zeppelin, a balloon-type airship) is not the same as designing and introducing a new financial service (for instance, banking via Internet). The previous section revealed that in service firms various types of innovation occur. In some service sectors particular types of innovation are very

dominant. Administrative service firms, for instance, are very often involved in supplier-dominated innovations (software applications), while in consultancy many innovations are initiated by the desires of individual clients. The various types of innovation can be used to classify the various sectors of the service industry.

A taxonomy of sectoral differences in innovation types

Many researchers have attempted to capture sectoral differences in innovation types by developing taxonomic models of industrial sectors. Pavitt (1984) developed a widely recognized taxonomy to describe the diversity of innovation. Following this taxonomy, industrial sectors are categorized as 'supplier-dominated', 'scale-intensive', 'specialist suppliers' or 'science-based'. This taxonomy pretends to apply to both manufacturing and service sectors.

Since Pavitt many scientists have attempted to refine his taxonomy by considering the innovative styles of service sectors more directly (e.g., Soete and Miozzo, 1989; Hulshoff *et al.*, 1998; Evangelista and Savona, 1998; Silvestrou *et al.*, 1992; Evangelista, 2000). Their findings can best be summarised by distinguishing supplier-dominated sectors, production-intensive sectors and specialized service sectors. In table 4 we summarise the types of innovation that are expected to be dominant in these sectors. Paradigmatic innovation is a very rare form of innovation that cannot be attributed to a particular type of sector.

table 4 Relationship between innovative sectors and innovation types

	Type				
Sector	*Supplier-dominated*	*Innovation within services*	*Client-led*	*Innovation through services*	*Paradigmatic*
Supplier-dominated	X				
Production-intensive		X	X		
Specialised services			X	X	

Supplier-dominated sectors. In these sectors innovation comes almost exclusively from suppliers of machinery and other inputs. Service firms in these sectors are usually mass-service organisations. They tend to have many customers. Transactions typically involve short client contact times and little client specific judgement (Silvestrou *et al.*, 1992). Examples of supplier-dominated service sectors are personal services (such as haircuts), hotels and restaurants and retail trade (Soete and Miozzo, 1989). In these sectors, innovation is usually not of a very radical nature. The innovation process will not be organised in a formal manner.

The link with the innovation types (presented in section 2.4) is straightforward. 'Supplier-dominated innovation' will be the prevailing type of innovation in supplier-dominated service sectors. It is not surprising that hardly any researchers have studied innovation in these sectors yet, because supplier-dominated sectors are considered to be less innovative.

Production-intensive sectors. These services, in contrast to supplier-dominated sectors, put considerable effort into the simplification of their service offerings (Soete and Miozzo, 1989). One of their main goals is to keep an eye on the efficiency of their delivery processes. Therefore, they tend to encourage the standardisation of service outputs, but in more advanced sectors the focus is on the adaptation of standardised services to particular user needs. Therefore, we expect both radical and incremental innovations to occur. Typically, radical innovation processes are organised in separate departments who are responsible for the development efforts. Examples of production-intensive service sectors include (Soete and Miozzo, 1989):

– network service firms, which are dependent on ICT networks (e.g., banks, insurance and telecommunication services). Developments in ICT improve the complexity, precision and quality of their service offerings, and especially facilitate customisation.
– scale-intensive service firms, which are dependent on physical networks. These networks are less flexible using ICT in terms of facilitating customisation, but they do provide economies of scale and scope (e.g., transport, wholesale).

We expect 'innovation within services' to be a dominant type of innovation in production-intensive sectors. Firms in these sectors mainly rely on internal sources and strategies for their innovative activities. Besides, we can expect to find relatively many examples of 'client-led innovations' because these firms tend to have strong relations with their customers (Evangelista and Savona, 1998).

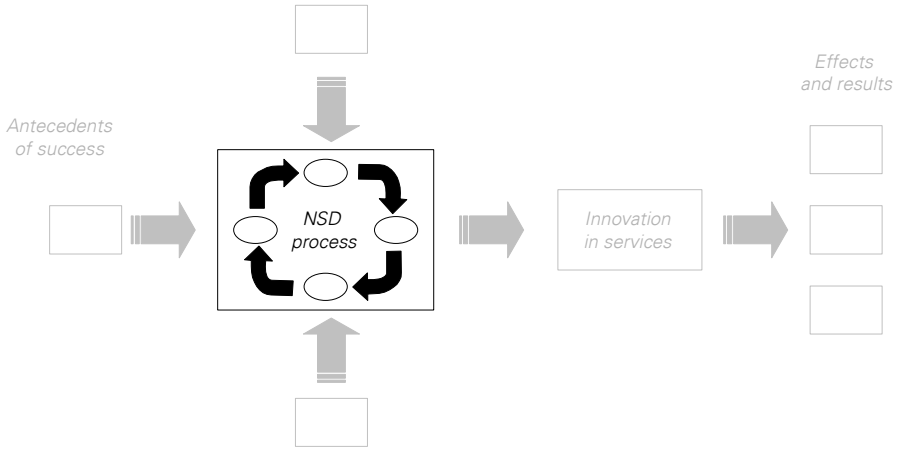
Specialised service sectors. In specialised service firms innovation is heavily dependent on the knowledge and skills of co-workers. The main source of innovation consists of the innovative activities of the service firms themselves, which are geared to the provision of outputs designed to suit the needs of particular users. Specialised service firms often have close interactions with their clients, that consist of manufacturing firms (Evangelista and Savona, 1998) and other service firms. Specialised service firms are also known as 'knowledge-intensive business suppliers' (e.g., Miles *et al.*, 1995; Den Hertog, 2000). Typical sectors include accounting and bookkeeping, R&D services, engineering, computing and management consultancy. Some other researchers mention these sectors as 'science-based sectors' (e.g., Soete and Miozzo, 1989). Many of these sectors have begun to boost only in the past 10-15 years (Tidd *et al.*, 2001).
We expect that the innovative efforts in specialised service sectors will be rather unstructured because most innovations will have an incremental nature. We do not expect to find separate R&D-departments because usually the co-workers are responsible for innovation in their daily work. Typically, these firms operate in a business-to-business environment, having only a few customers with relatively long client contact times (Silvestrou *et al.*, 1992). They usually make considerable adjustments in their services to meet customer needs. It is likely that 'client-led innovation' and 'innovation through services' are dominant types of innovation in these sectors.

3 Development of new services

3.1 Introduction

Innovation in services has long been regarded as a non-significant phenomenon. Only in recent years have researchers begun to realize that innovation in service firms does exist and should be studied. This also applies to the investigation of how new services are developed (figure 4).

figure 4 Content of this chapter



While it is clear that insights developed in the context of manufacturing can be applied to services, it has also become clear that some adjustments are needed. In section 3.2, we discuss the consequences of the characteristics of services (intangibility, heterogeneity, etc.) for the NSD process.
In service firms, the innovation process tends to be an ad hoc one. Contributions to literature on new product development (NPD) indicate that a more formalized approach has important advantages. Section 3.3 surveys a number of models to describe the NPD process. In section 3.4, we integrate our findings to propose a two-stage model for new service development (NSD). This model consists of a search stage in which ideas are gathered and screened, and a development stage in which promising ideas are transformed into new services.

3.2 New service development: an ad hoc process

For many firms, new service development tends to be a haphazard process: it simply 'happens'. Rather than developing more formal structures to elicit ideas for new services, develop and select among them concurrently, it is mostly ad hoc (see, for instance, Gallouj and Weinstein, 1997; Martin and Horne, 1993; Kelly and Storey, 2000; Sundbo, 1997). Only in a limited number of sectors is a formal approach to NSD usual. For instance in financial services, innovations tend to be development by formal rules and procedures more often than in other service sectors (Vermeulen, 2001). In this case, the innovation process is organised in the same manner as R&D projects in manufacturing.
Below, we list some of the reasons why innovation in services is mostly ad hoc. Because the service characteristics (intangibility, etc.) have some implications for NSD, service

managers tend not to organize this process very formally. Therefore, we start our discussion with an overview of the implications of service characteristics for the NSD process.

Consequences of service characteristics for NSD

The characteristics of services, as discussed in section 2.2, have some important implications for the development of the new services process (e.g., Vermeulen, 2001; Shostack, 1984; Shostack, 1987; Easingwood, 1986; De Brentani, 1991; Thwaites, 1992; Terrill, 1992).

Innovation may not be recognized. The direct interaction between a customer and the service firm actually tends to take shape during a longer period of time. For a service firm itself, it may prove difficult to establish the extent to which a customized service is different from the services otherwise provided. Thus, it may not be recognized when the principles of innovation management should be employed. There is also a tendency not to observe the potential of a new service to offer value for other customers (Johne and Storey, 1998). Besides, entrepreneurs may not regard innovation as a phenomenon that is relevant to service firms. It is usually considered to be quite important for manufacturing firms, but not for service firms.

New services can be imitated from competitors. The intangibility of services is the key factor that affects the development process of new services. De Brentani (1991) argues that developing new services tends to be easier than developing manufactured products. This is due to the absence of patent applications, prototypes or major investments in raw materials (Shostack, 1984). On the whole, services are easy to imitate. According to Easingwood (1986), this results in a less formalized approach for developing new services. Service firms rely on their abilities to respond quickly to competitors' innovations. One should be aware, however, that in practice there will be many exceptions. For instance, the services of engineering consultants are knowledge-intensive and therefore less easy to imitate.

Termination of NSD projects tends to be easy. Services are often custom-made. Since services usually are labour-intensive, the variable costs are the biggest part of development costs (Nambisan 2001; Chase *et al.*, 1998). NSD efforts can be terminated more easily in comparison with manufactured products. Of course, this does not apply to some particular service sectors, for instance banking and telecommunications.

It is regarded as a trial-and-error process. The fact that services cannot be stored was referred to as the perishability of services. Testing new services is more difficult because a prototype is not available. In practice, service firms view NSD as a trial-and-error process of incremental improvements after a new service has been launched. Customers fulfil an important role, because their feedback is indispensable to improve a current service offering (Kline and Rosenberg, 1986).

No natural occasions for review. The nature of services is, of course, such that it is difficult to define moments that offer a 'natural' occasion for review. The direct interaction between a service firm and the customer (simultaneity) means that a more systematic evaluation of the development process is difficult to implement. Once management has decided to develop and implement a service concept, it is hardly possible to distinguish between the various stages of the NSD process. Idea generation, screening, evaluation, development, testing and market launch will overlap to some extent. Even

when NSD is formalized, the final stage of testing a new service often consists of simply bringing it to the market (Easingwood, 1986).

Communication problems may arise. Intangibility makes it more difficult to develop a new service because the co-workers involved cannot see, feel or touch the service being developed. It may be more difficult to overcome communication problems among the co-workers who are responsible for delivering the new service, because there is no physical object to which all can direct their thoughts (Ennew *et al.*, 1992).

Frontline co-workers should be involved. Simultaneously producing and consuming services is also of influence on the development process. The role of frontline co-workers (responsible for sales and/or service delivery) is often crucial, because customers are in direct contact with them. These co-workers are the ones who can register problems that customers experience, and who should come up with ideas for new services. Besides, frontline co-workers are necessary for effective implementation. Close involvement and integration of frontline co-workers in NSD is therefore considered highly desirable (Edgett and Parkinson, 1994; Easingwood, 1986). In section 4.2, we elaborate on this subject.

NSD is mostly ad hoc

Referring to our discussion on radical and incremental innovations (chapter 2), we state that in service sectors two types of innovation processes can be distinguished. First, we can distinguish large-scale, formally managed innovation processes that look almost the same as R&D projects in manufacturing. This type is relevant to a limited set of service sectors such as financial services. Second, we can identify a less formalised approach to develop incremental improvements. For these kinds of innovations service-firm sectors tend not to adopt formal systems to manage the development process (Kelly and Storey, 2000; Johne and Storey, 1998; De Brentani, 1989).

Given the fact that incremental innovations are far more widespread, and the implications of the characteristics of services discussed above, an NSD process that is most of the time ad hoc is not surprising. We think the most important reason is that service entrepreneurs do not recognize opportunities for innovation. They perceive these as something that happens in manufacturing firms, but not in services. Therefore, they tend not to worry about formalising innovation so much.

When service entrepreneurs do admit the value of innovation, they will be less motivated to follow a formalised approach. New services are easy to imitate and sunk costs are low, since services are labour-intensive. Besides, to some extent, service innovation will always be a trial-and-error process of continuous improvements. Once management has decided to develop a new service, progress is more difficult to monitor than in manufacturing.

Finally, in the NSD process, various problems can arise. Intangibility can easily entail communication problems between co-workers. Moreover, because frontline co-workers should be involved, it is more difficult to formalise. The day-to-day work has to be continued. Particularly in small service firms, this implies that frontline co-workers can only support development efforts on a part-time basis. In section 4.2.1, we further discuss the role of front-line employees.

3.3 Learning from product-development approaches

Need for formalization

In manufacturing firms the application of formalized models for NPD has proven to be highly beneficial (e.g., Griffin, 1997; Cooper and Kleinschmidt, 1987; Cooper, 1984). This appears to hold for service firms as well: firms being successful in providing new services approach their innovation process formally (Kelly and Storey 2000; Johne and Storey 1998; De Brentani, 1989; Bowers, 1989). At the same time as it is observed that NSD is mostly ad hoc, it becomes clear that firms provide services far better when they are innovative and prevent their innovation process from being ad hoc (Fröhle *et al.*, 2000; De Brentani, 2001). It is likely that these firms are better able to recognize opportunities for innovation and to organise the NSD process effectively and efficiently.

Thus, successful innovation in services should be regarded as a controllable event. The question is how the NSD process can best be organized. Not many researchers have attempted to investigate this for service firms (Johnson *et al.*, 1999). In this section we start with the insights provided by new product-development (NPD) literature that has been developed in a manufacturing context. In chapter 2, we mentioned that in practice, the distinction line between products and services tends to be blurred. It is likely that many similar issues will arise, so manufacturing concepts can be useful (Sundbo, 1997). Therefore, we start with a discussion of various product-development approaches. We make an inventory of their benefits, which will be used to propose an NSD model for services (section 3.4).

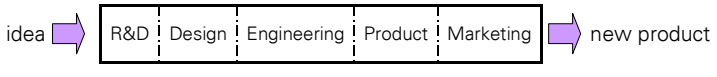
Models to describe the product-development process

In manufacturing, researchers have focused frequently on describing the various steps that have to be taken in the development of a new product. Many formal procedures have been described at length in new product-development (NPD) literature (e.g., Saren, 1984). Some of these models are discussed by Vermeulen (2001):

- Departmental-stage model
- Activity-stage model
- Conversion model
- Response model.

Departmental-stage model. Such models view the development process as a series of stages that are connected with a specific function or department (Saren, 1984). Every department performs a specific task, through which an idea is developed into concrete results. It moves from one department to the next until it emerges as a new product and is introduced in the market (figure 5). Departmental-stage models do not pay much attention to the actual activities, but merely provide insight in the departments that are usually involved in the NPD process (Vermeulen, 2001).

figure 5 Example of a departmental-stage model



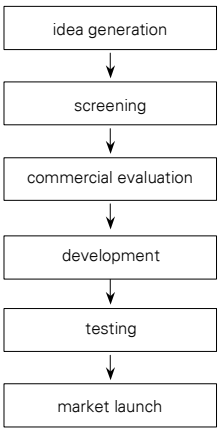
Source: Adapted from Saren (1984).

The departmental-stage model is not very suited for formalizing the NSD process. Most service firms are very small. It is unlikely that there are functionally specialized departments that can contribute specific knowledge to a new service. Besides, a departmental-stage model means that a new service tends to be 'tossed over the wall' from one

department to another. For this reason, the departmental-stage model has been abandoned in manufacturing firms.

Activity-stage model. Activity-stage models are the most widely recognized models to describe NPD. They focus on the actual development activities that are carried out to develop a new product. The NPD process is broken down into a number of activities that are conducted sequentially. Various activity-stage models have been proposed that focus on different types of activities that vary in the amount of time and effort spent on each stage (e.g., Cooper, 1994; Saren, 1984)[1].
The most famous activity-stage model was developed by Booz *et al.* (1982). It identifies six stages: idea generation, screening, commercial evaluation, development, testing, and market launch (figure 6). Most studies suggest a version of this model for NPD purposes (Johne and Storey, 1998).

figure 6 Example of an activity-stage model: Booz, Allen & Hamilton

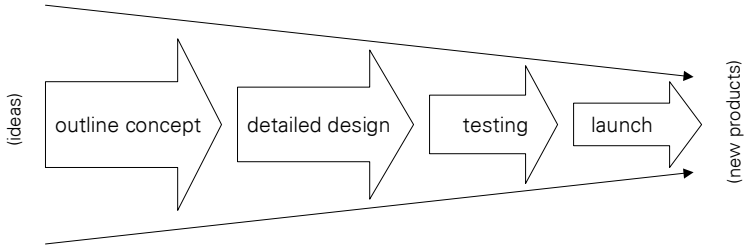


Source: Booz et al. (1982).

The task of making innovation happen - moving from an idea through to successful products or processes - is essentially one of managing what Wheelwright and Clark (1992) call 'the development funnel'. The essential feature of the funnel is that at regular moments in time, selection of ideas (by individuals not involved in the development themselves) takes place. At such points, progress can be monitored and (additional) resources can be committed (Tidd *et al.,* 2001). So, activity-stage models present NPD as a gradual process of reducing uncertainty through a series of problem-solving stages, moving through the phases of scanning and selecting and into implementation (figure 7).

[1] Related to activity-stage models are the so-called decision-stage models (e.g., Cooper, 2001). Here, the focus is more on what is needed before the next step can be made. These models can be considered as the 'mirror image' of activity-stage models and will therefore not be discussed in detail.

figure 7 Example of an activity-stage model: the new product-development funnel



Source: Adapted from Tidd et al. (2001).

The main advantage of activity-stage models is that they specify the tasks that need to be conducted. However, these tasks are performed sequentially, which may lead to long development lead times, communication problems and increased costs. Integrating the various activities in the innovation process is a way to overcome these problems. The various steps can overlap (Clark and Fujimoto, 1991).
In our opinion, this applies to service firms as well. The various stages of the NSD process should be allowed to coincide and overlap. This is even strengthened by the characteristics of services. The direct interaction with the customer means that a more systematic approach of the development process is difficult to implement. We cannot, for instance, consider testing and market launch to be fully separable stages since developing a prototype of a new service is not possible.

Conversion model. Conversion models provide a view of product development as the transformation of inputs (such as raw materials) into outputs (such as new products) (Twiss, 1980). The advantage of these models is that they do not look at innovation processes as a logical sequence of activities, but emphasize that innovation processes are much more chaotic and less rational (Saren, 1984). Conversion models do not look at the innovation process as a rational process in the sense that goals are formulated at the start and firms evaluate progress based on these. In fact, the actual service-development process remains a black box (figure 8).

figure 8 Example of a conversion model

Source: Adapted from Saren (1984).

Due to their rather unstructured nature, conversion models might be the best description of the current NSD practices in service firms. However, to improve the effectiveness and efficiency of NSD efforts, the black box should be opened. Conversion models are less suitable for providing service managers/entrepreneurs with a sensible description of the NSD process. Therefore, we do not regard conversion models as a good starting point to describe NSD.
However, the conversion model has some advantages as well. It is important to recognize that innovation in service firms is often an unstructured process that cannot be divided into distinct steps. Recurring relations may occur between the various activities; for instance, launching a new service can lead to adjustments in the service concept (new development activities).

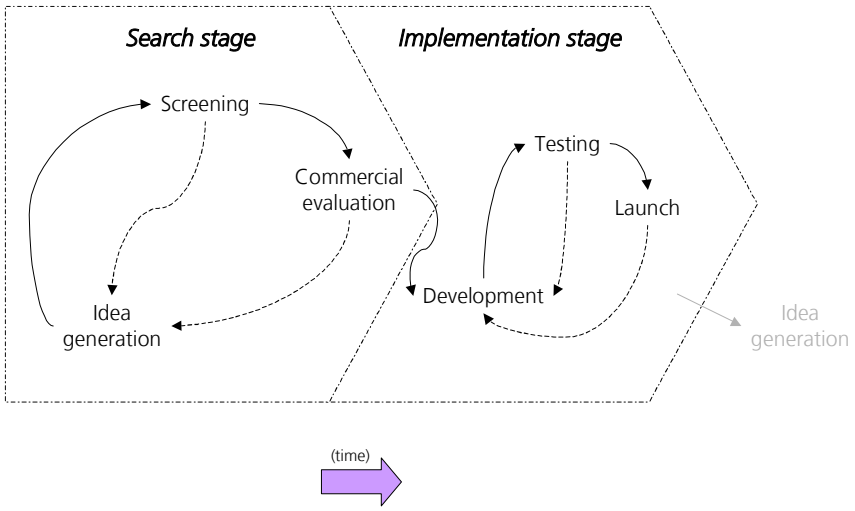
Response model. This is an outside-in kind of model that accounts for the fact that organizations respond to changes in their environments. The response model puts an

emphasis on stimuli from the environment that need to be perceived, a response that needs to be developed and then worked out. An example is the four-stage model based on the work of Becker and Whisler (1967). It features perception, search, evaluation, and response as necessary steps to respond to external stimuli.
In the context of new service development, the benefit of response models is that they stress the role of external parties as initiators of innovation. After launching a new service, the feedback from clients and/or actions of suppliers and competitors can trigger a service firm to make further adjustments in the service offering (new development activities) or serve as a source for ideas for other innovations.
A drawback of the response models is that they tend to over-emphasize the importance of external parties. As discussed in section 2.4, service firms can also initiate innovations themselves.

3.4 A model for new service development

A model for new service development should account for the consequences of specific service characteristics (as discussed in section 3.2) and the benefits and drawbacks of the various product-development approaches (section 3.3). To adequately describe innovation in services, we propose a two-stage model (figure 9). In this section, we discuss its main characteristics.

figure 9 A model for new service development



Two stages. We are aware that any division into separate steps is an arbitrary one to some extent. The goal is to make decision and selection processes about projects and resources more rational. Seeking to define steps for the process of creating new services is even more arbitrary than in manufacturing since the services sector must be considered very diverse (Suijker *et al.*, 2002). Therefore, a general model for NSD is inevitably very simplified.
Following authors like Zaltman *et al.* (1973) and Buijs (1987), we propose a simple version of the activities-stage model by dividing the NSD process in only two stages: a search stage and an implementation stage. In the search stage the organisation generates ideas and determines the objectives for further development. These ideas can be initiated by various actors, such as clients, suppliers, competitors or by (co-workers of) the service firm itself (as discussed in section 2.4). The search stage has a divergent

character. Each idea should be regarded as promising and an opportunity to improve results. Creativity and the ability to make sound judgements are very important assets. In the implementation stage, the most promising ideas are transformed into concrete results. This stage has a convergent character in which the co-workers responsible for development should behave very result-orientedly.

Six activities. In order to be meaningful for service managers, it is clear that the NSD process should be described by distinguishing various activities. For this purpose we have used the widely recognized NPD model of Booz *et al.* (1982) as a starting point. We regard idea generation, screening, evaluation, development, testing and market launch as necessary activities for successful innovation in service firms.
The process starts with the generation and gathering of ideas. There is a general selection of the generated ideas by looking at the market potential and production possibilities. Then the most promising ideas are thoroughly analysed in terms of marketing, competitors and costs. This prevents the waste of (financial) means and ensures that sunk costs will be minimal. Once management has decided to implement an idea, an implementation stage will follow in which the firm actually develops, tests and launches the new service, so in this stage the idea is transformed into a concrete result.
Our model in figure 9 might suggest that the NSD process is exactly the same as in manufacturing. Although the generic process of gathering and developing ideas actually coincides, there are some differences related to overlapping activities and recurring relations between various activities. These are discussed below.

Overlapping activities and recurring relations. A general drawback of the NPD models is their linear nature. Steps are distinguished that need to be made sequentially. This approach results in long development lead times, communication problems and increased costs (Wheelwright and Clark, 1992; Pisano, 1997).
Especially in a rapidly changing environment (such as many service sectors), linear models are less useful. Due to the intangible and simultaneous nature of services, the NSD process is more organic. Besides, to reduce communication problems, NSD can only be successful if large amounts of information from various disciplines are integrated. For these reasons, NSD activities should be allowed to overlap.
In the search stage the activities of idea generation, screening and evaluation are likely to overlap in time. It is a more or less continuous process of gathering ideas (from front-line co-workers, customers, or other parties) and assessing their suitability and economic potential. These assessments can also lead to the adjustment of ideas, or the generation of entirely new ideas[1].
In the implementation stage the activities of development, testing and commercialisation can coincide as well. It is a recurring process of designing a service offering, selling/offering it to customers, gathering feedback from customers and front-line co-workers, making adjustments in the service offering, etc. Because of a lack of natural opportunities for review (section 3.2), there is a tendency for new services to be incremental improvements on services that are already available. So, the implementation stage should be regarded as a controllable and structured trial-and-error process (Johne and Storey, 1998).
Finally, both stages are connected as well. It is evident that the search stage describes what is necessary before the implementation stage can actually 'happen'. But, in addition, the second stage can also have considerable effects on idea generation. One should think of ideas for completely new or adapted services that originate from the

[1] As indicated by the dotted lines in figure 9.

feedback from customers and/or frontline co-workers, or from the reactions of competitors (since new services are usually easy to imitate).

Some remarks. We do not claim that figure 9 presents the ultimate model for new service development. Differences between various service sectors could have been accounted for, but in this study we have chosen to propose a general model. For specific service sectors, the relative importance of both stages and its activities will be quite different. Our model will have value for service firms as a reminder of the activities that should be performed and their relative positions. When managers are aware of the steps and activities in the NSD process and their relationships, they should be able to recognize opportunities for innovation more easily and to manage NSD more effectively and efficiently.

We have attempted to compose a model for NSD that accounts for the characteristic features of services, and that does not completely discard the insights from innovation in manufacturing. It seems particularly useful to describe how incremental innovations, which are by far dominant in services, are developed.
However, we should keep in mind that our model will be adequate to describe more formally managed types of innovation processes as well. Manufactured products are increasingly extended by additional service components (such as factories offering repair and maintenance services). Besides, not all services are intangible, produced simultaneously, heterogeneous, and perishable. We believe that many of the elements discussed above (recurring relations, overlapping activities) will be applicable to manufactured products and formally developed service innovations as well. In fact, models to describe formal R&D projects (e.g. Booz *et al.*, 1982) are a special case of our model shown in figure 9.

We must stress that figure 9 is a very limited presentation of the development process in service firms. As mentioned, gathering feedback from customers and front-line co-workers is an essential part of the implementation stage. In general, we could add a wide range of factors that influence the NSD process directly or indirectly. Apart from customers and co-workers, one can think of:
– available resources,
– corporate strategy,
– market conditions,
– etc.

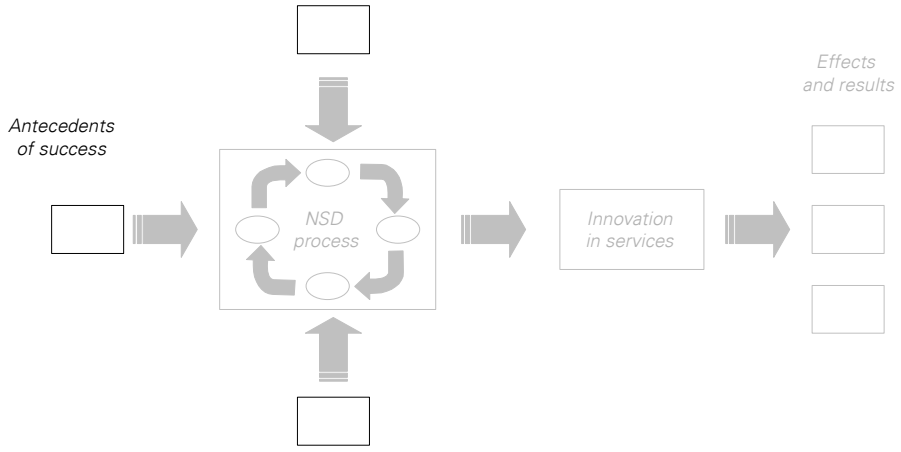
The next chapter elaborates on these subjects. It focuses on the antecedents of innovation in service firms.

4 Antecedents of successful innovation

4.1 Introduction

This chapter provides an overview of the antecedents of successful innovation in service firms (figure 10).

figure 10 Content of this chapter



Innovation success is influenced by a large number of factors. Some of these are manageable by service firms themselves (success factors), while others are basically unmanageable (external conditions).
In section 4.2, we discuss the success factors of innovation in services. Some of these are directly related to the activities in the new service-development process (people, structure, resources and networking), while others tend to create an internal climate that is supportive to innovation (culture and leadership, strategy and company characteristics).
Section 4.3 presents external conditions that affect the results of innovative efforts by service firms. These mostly autonomous conditions are related to market characteristics, the knowledge infrastructure and government policy. This section is about the part of innovation success that service managers can influence only indirectly, or even not at all.

4.2 Success factors

Service firms are able to influence the innovation success to a large extent themselves. Some of the success factors are directly related to the activities in the new service development (NSD) process. These success factors - which are related to people, structure, resources and networking - are presented in section 4.2.1.
Other success factors do not deal with the NSD process directly, but tend to create an internal firm climate that is supportive to innovation. Our discussion in section 4.2.2 focuses on culture and leadership, strategy and company characteristics.
Before we start our discussion, we wish to mention two things. First, in the previous chapter we presented a two-stage model to describe the NSD process. In literature, it is frequently not clear to what stage a success factor is limited. Many researchers do not worry about this too much because most success factors somehow affect both stages.

Here, we intend to provide a general discussion of the success factors but, whenever a success factor is relevant for a particular stage of the NSD process, we shall discuss this explicitly.
Second, the success factors could be compared to those of manufacturing firms. Due to the basic differences between products and services (intangibility, simultaneity, heterogeneity and perishability) they will differ to some extent (De Brentani, 2001; Vermeulen, 2001). Whenever differences with manufacturing are relevant, we mention these.

4.2.1 *Factors related to the NSD process*

Literature reveals 17 success factors that intervene directly with the activities in the NSD process (table 5).

table 5 Success factors directly related to the NSD process

People	*Structure*	*Resources*	*Networking*
- Front-line employees	- Rules and procedures	- Financial resources	- Interaction with clients
- Innovative roles	- Task descriptions and rotation	- Information technology	- External focus
- Expertise	- Multifunctional teams	- Assignment of co-workers	- Co-operation with other parties
	- Internal co-operation		- Pre-launch testing
	- Reward system		- Market launch
			- Reputation (role of peers and experts)

Source: EIM, 2002.

The co-workers of a service firm are at the heart of successful NSD (Schneider and Bowen, 1984). They are the ones who have to come up with ideas, concepts, and specifications, and turn these into successful innovations. Besides, co-workers can be a source of resistance to innovative efforts. This is another argument to involve them early in the NSD process.
Organisational structure is the formal system of work relationships that both divides up the various work tasks (differentiation) and provides co-ordination between these tasks (integration). Of course, this applies to organizing NSD activities as well. Resources are a necessary condition to be innovative; especially in the implementation stage of the NSD process, sufficient resources are indispensable. Networking refers to the activities that service firms perform to identify market opportunities and client wishes, and to affect relevant parties in their working environments. Below, we elaborate on these subjects.

People

Front-line employees. In section 3.2, we already mentioned that front-line staff should be involved in the NSD process. All too often service firms view their front-line personnel simply in terms of an approach to providing their service - that is, a delivery system. However, because of the inseparable nature of services, front-line employees shape the quality of a customer relationship. De Brentani (2001) concludes that having highly trained employees who have an intimate knowledge of the customer plays an important role in the success of new services. Front-line employees can produce value during several stages of the NSD process:

– Early in the process, front-line employees can be crucial for gaining insights about client needs and opportunities. Their close contact and potentially long-term relationships with customers make such employees an important source of ideas.

– During the implementation stage their knowledge of customers and of competitive offerings can help in defining the appropriate level of service customisation and user-friendliness. Besides, during market launch, it is the ability of front-line staff to 'educate' and persuade clients about the benefits of a (totally) new way of solving a problem that can bring about the adoption of the new service. They can also be a major source of resistance when they are involved in the development and implementation efforts too late.

In general, encouraging front-line employee involvement in new service development increases the likelihood of positive implementation of innovative services. The front-line employee can play an essential role in embodying the service itself, in differentiating it from similar competitive services, and in helping clients to make the switching decision (Atuahene-Gima, 1996; Johne and Storey, 1998).
Compared to manufacturers, successful service firms should place greater emphasis on the selection, development, and management of employees who work directly with the customer. Employees are, however, often reluctant to become involved in development activities as new products may increase their workload (Davison *et al.*, 1989; Easingwood, 1986; Scheuing and Johnson, 1989). Therefore, managers also need the skills to sell an innovative idea to front-line employees. This is critical to gain their involvement and support (Atuahene-Gima, 1996).

Innovative roles. Among the co-workers who are responsible for carrying out the implementation stage, the presence of certain key roles is decidedly relevant. One of these roles is the so-called 'product champion'. A product champion is someone in an informal role that pushes a new service beyond road blocks within the organisation (Shane, 1994). Research in manufacturing firms shows that successful firms are more likely to use and keep product champions. This is often not the case in service firms (Martin and Horne, 1993).
In addition to a product champion, some other roles are important as well (De Jong and Kerste, 2002). In practice, these roles are often combined and performed by one person. A service firm that attempts to improve the results of NSD efforts should check for the presence of:
– Decision makers (decide during the search stage whether the next step is worthwhile or that the development process should be terminated)
– Project leaders (the employee who co-ordinates innovative efforts and keeps an eye on the time path)
– Sponsors (the senior manager should constantly encourage innovation and provide necessary resources)
– Ambassadors (talk positively about the NSD projects and persuade other employees to provide support as well).

Expertise. A lack of highly qualified and experienced development staff is a major barrier to many innovations (Drew, 1995; Johne and Harborne, 1985). High expertise refers to the availability of detailed knowledge about the firm's basic technologies, customers and delivery processes (Fischer *et al.*, 1993). This factor is critical for the development of new services, but also for the search stage since a high expertise helps to make sound judgements about innovative ideas.
High expertise determines the success of innovative service concepts. Education and training-on-the-job are relevant to improve a firm's expertise, to enlarge the body of knowledge and increase the creative and problem-solving capacities of employees.

Structure

Rules and procedures. A service firm's NSD process can be formalised by maintaining various rules and procedures. This provides directions for 'how to behave'. The effect of rules and procedures can be twofold. As we discussed in section 3.3, firms successful in providing new services appear to approach the NSD process formally. Formalisation contributes directly to the execution speed of the NSD process by providing guidelines which stimulate effectiveness and efficiency (Fröhle *et al.*, 2000). On the other hand, one should be aware that too strict rules and procedures will have the opposite effect. Particularly during the first stage of the NSD process, a firm derives no benefit from many rules and procedures. An overkill of formalization is devastating for creativity (Edvardsson *et al.*, 1995; Bodewes, 2000).

Task descriptions and rotation. In NSD projects, task descriptions can be used to communicate what is expected of co-workers. Amabile (1998) points out the importance of good task assignment to employees as a means of improving innovation success. The decisive factor here is the challenge presented by an NSD project. The challenge should not be so small that people get bored, nor should it be so great to make them lose control or feel threatened. When employees face challenges, they will be more motivated for the forthcoming changes, which increases the chances of a successful development.
Task rotation is frequently exchanging tasks and jobs among employees. This is a method to broaden the employee's point of view. It makes employees in an organization familiar with each other's work (Prakken, 1994). This supports the innovation success in service companies (De Jong and Kemp, 2001; Atuahene-Gima, 1995). When co-workers experience frequent task rotation they find it easier to place problems in a wider context. Work experience in different job areas enhances creative potential, since the broad experience gained by employees will enable them more often to come up with ideas for improvement in services, delivery processes, etc.

Multifunctional teams. The employment of multifunctional teams for NSD contributes directly to the overall effectiveness of developing new services (Fröhle *et al.*, 2000). A multifunctional team is a group of persons with different backgrounds (work, education, experience, etc.) who carry out the second stage of the NSD process. Multifunctional teams appear to increase the problem-solving ability and performance (Ancona and Caldwell, 1992). Gallouj and Weinstein (1997) reflected this belief in their statement that flexible, cross-functional teams are successful in development activities because of the new combinations of knowledge and competencies they offer to the organization. Pisano (1997) found that integrated, cross-functional teams completed development projects sooner and with fewer effort hours than did firms that were separated functionally.

Internal co-operation. Vermeulen (2001) concludes that functionally departmentalized structures can impede positive results of NSD. In a study investigating banks and insurance companies, he found that a lack of internal co-operation resulted in tensions between various parts of the organization. There is always a danger that co-workers, who start the innovation, will dominate the NSD process. In successful firms, the start of new service development is made by several groups of co-workers together, not only those responsible for renewal (senior management, staff), but also the front-line employees who are occupied with sales and customer service every day. In fact, it is of minor importance which co-worker starts the innovation, but it is very important that all groups of co-workers will co-operate and share information (Van der Aa, 2000).

Reward system. Many firms employ reward systems that aim to improve the efficiency of the existing work processes. With such reward systems, improvement means 'doing an existing job better'. Traditional reward systems imply upholding the regular rules and procedures in a company.
In order for NSD to be successful, reward systems should be adjusted (Johne and Storey, 1998; Scheuing and Johnson, 1989; Debackere *et al.*, 1998). McGourthy *et al.* (1996) discuss a number of examples of suitable reward systems, for instance reward team performances (this stimulates internal co-operation) or rewarding innovative efforts (the reward could be based on the number of generated ideas or results of the implementation stage).

Resources

Financial resources. Time and money are required to carry out most innovations (Elfring, 1997). In the search stage, a lack of financial resources can be devastating for creativity. When co-workers are aware of the fact that there are no resources available to work out ideas, they will not be very motivated to generate ideas at all. In the implementation stage resources are needed to develop service concepts, sell these to customers, collect feedback and make adjustments.
According to Preisl (1998), the attitude of financial institutions towards financing innovation is still determined by typical manufacturing innovations. Investment in human resources and the development of innovative service concepts is not an asset banks are prepared to lend money against, because there is no inherent material security (such as buildings, machines or patents).

Information technology. Information technology (IT) has given service firms a range of possibilities to standardize their processes and so increase their efficiency. In section 2.3, we discussed the fact that technological options can be a relevant dimension of an innovation in services. IT choices appear to play a significant role in both stages of the NSD process (Fischer *et al.*, 1993; Fröhle *et al.*, 2000). First, IT is a valuable tool for idea generation. Information-rich environments are traditionally being associated with highly innovative organizations. IT enables the use of information bases with patent ideas, previous discoveries, marketing data about customers and competitors. This information helps to generate ideas for new or improved services.
Second, IT accelerates the development of new services, and generally supports the firm's goal of rapidly bringing new offerings to market. For instance, Huete and Roth (1988) showed that in banking services, IT is frequently a vital part of the production and delivery process. IT can improve interaction within and between firms and can help streamline and re-engineer vital business processes (Grint *et al.*, 1996; Wang, 1997; Dover, 1987).
To realize these benefits, however, organizations must do more than just issuing a purchase order for new IT tools. Training, employee attitudes and the perception of managerial encouragement have all been shown to moderate the effectiveness and adoption of new IT tools (Agarwal and Prasad, 1997; Leonard-Barton and Deschamps, 1988; Roth *et al.*, 1997).

Assignment of co-workers. Explicitly assigning co-workers to NSD is another antecedent of innovation success in service firms. This entails assigning co-workers to development projects, and allowing that to be their primary task. In the implementation stage, it is necessary that co-workers are able to focus on the development task at hand. When employees are assigned to work on NSD only part-time, they experience working on a project as something additional to their daily activities, which often results in longer development times because team members' priorities are with their daily work

(Vermeulen, 2001). However, front-line co-workers should be involved in the development process (as discussed above). Since their daily work has to continue (also to acquire feedback from early adopters), a service firm should help co-workers who are responsible for NSD to find the right balance between innovation and daily work. This could be realised by giving them lower targets, etc.

Networking

Interaction with clients. In new service development, customer involvement sometimes seems to be relatively low, although is it extremely important (Martin and Horne, 1995). Kline and Rosenberg (1986) mention the significance of interaction with clients as a success factor for NSD. Service firms that maintain intensive contacts with their customers will pick up information about customers' experiences with their services, using this to improve themselves. This enables them to execute the search stage more effectively.
Interaction with clients is also necessary in the implementation stage of the NSD process. We have already stressed this in section 3.4: the development of new services is a controllable trial-and-error process. When a service firm is sensitive to signals from its clients, innovation success is more likely (Bortree, 1991). Technically or intuitively driven development often results in innovations that lack relevance to a customer. Hence, it is crucial to identify the precise needs of the market (Berry and Hensal, 1973; De Brentani, 2001).

External focus. External focus provides co-workers with information that stimulates idea generation and problem-solving capabilities. We conclude that both stages of the NSD process benefit from this. When the co-workers of a service firm have frequent, intensive contacts with actors in the environment of the company (suppliers, competitors, research institutions, consultants, sector organizations), they will identify market opportunities and threats from their working environments much faster and use them to create or improve services (De Jong and Kemp, 2001). In service firms, due to the ease of copying, competitors have been identified as an important source of ideas for innovations (e.g., Easingwood, 1986; Hooley and Mann, 1988; Scheuing and Johnson, 1989). For instance, Teixeira and Ziskin (1993) found that approximately 80 per cent of banks and insurance companies view their competitors as the main source of new services. Labour mobility is a well-known source to gather information from competitors. Because services tend to be easy to imitate, competitive advantage will last for a short time period only.

Co-operation with other parties. Co-operation with other parties (suppliers, customers, competitors, research institutions, etc.) is another antecedent of successful NSD. In this case, a development team will entail members from other organizations. Each participant brings in his own knowledge and skills. A contract is usually signed by all parties that are involved before the co-operation starts. This contract focuses on the objectives, resources, time path, etc.
Co-operation with other firms is particularly relevant for small service firms (De Jong and Kemp, 2001). It enables them to lower the risks of failure and ensures a more efficient development process. Besides, using the knowledge and skills of external participants results in an increase in the variety of the information. Hulshoff and Snel (1998) mention that gaining new knowledge is one of the most important motives for technological co-operation between firms. The participants can look at problems from different perspectives.

Pre-launch testing. In section 3.4, we mentioned that testing often coincides with development and market-launch activities. We stress that service firms should not completely refrain from testing new services. Service firms should evaluate new services with early adopters and use their feedback to further refine the service concept, delivery system, etc. (De Brentani, 2001; Fisscher *et al.*, 1993; Easingwood and Percival, 1990). Still, there seems to be a general lack of testing between idea generation and launch (Davison *et al.*, 1989). This is in part due to the fact that a large number of new services are copied from competitors. There is a widely held view that there is no need for market research because risks in copying are perceived to be relatively low. Another argument is that formal quantitative research is generally not a reliable means of assessing consumer acceptance of new services (Langeard *et al.*, 1986). Compared to manufacturing companies, the absence of a physical prototype and the difficulty of reproducing market conditions cause problems in testing.

Market launch. As discussed in section 3.4, market launch generally is the last activity in the NSD process. In the implementation stage, the proficiency of market launch is an antecedent of innovation success (Atuahene-Gima, 1996; Berry, 1986; De Brentani (2001). A careful market launch consists of the following ingredients: training of front-line co-workers, effective marketing and evaluation of the results of the launch. Synergy with existing marketing efforts is important as well. A new service should fit the firm's marketing competencies such as marketing research, sales force, promotion, distribution and customer service (Edgett, 1994; Storey and Easingwood, 1995; Easingwood and Storey, 1996).

Reputation (role of peers and experts). Due to the characteristics of services, a service firm's reputation is important for successful NSD (Terrill, 1992; Ford and Bowen, 2002; Reicheld and Sasser, 1990). The question is how customers determine the value of a new service. In many services, other parties will be involved in the determination of its value. In this context, Zeithaml (1981) discusses the existence of so-called:

- search goods (goods of which the quality is readily discernable, from their appearance, often before purchasing),
- experience goods (a consumer can only determine its value after purchase, by using or experiencing it), and
- credence goods (a consumer finds it almost impossible to determine the value and therefore relies on the judgement of others).

We argue that due to simultaneity, intangibility and heterogeneity, services are either an experience good or credence good. Therefore, customers tend to ask peers (e.g., friends, relatives, colleagues) or experts for advice[1]. This holds especially for newly developed services. Reputation is crucial and, in the case of new services, peers and experts are likely to make recommendations to the customer before purchasing. Since a service firm's reputation partly determines the judgement of peers and experts, management should identify and influence such parties to stimulate innovation success (e.g., by giving them a free and/or preferential treatment).

4.2.2 *Factors creating a supportive innovation climate*

From literature we derived 10 factors that do not directly affect the NSD process, but tend to create an internal climate supportive to innovation (De Jong and Brouwer, 1999). These are mentioned in table 6.

[1] Wijnberg (1995) mentions this as peer-and-expert selection.

table 6 Success factors creating a supportive innovation climate

Culture and leadership	*Strategy*	*Company characteristics*
– Management support	– Business vision	– Technological synergy
– Open culture	– Innovation objectives	– Firm size
– Internal communication	– Fit with overall strategy	– Complexity of service design
– Autonomy of co-workers		

Source: EIM, 2002.

Organizational culture is at the heart of an organisation's informal structure. A strong culture means a system of informal rules that spells out how people are to behave. Knowing what is expected of them, employees will waste little time deciding how to act in a given situation. Leadership is a very strong antecedent of organizational culture and will therefore be discussed as well. Culture and leadership enable a firm to motivate employees for innovation and benefit from their capabilities.
Strategy provides a firm with general directions for the future. Strategic attention to innovation keeps a firm from viewing innovation as an ad hoc process and provides guidelines for the distribution of resources. Finally, we discuss the effect of some basic company characteristics. We shall learn that their influence on innovation success in service firms is still ambiguous.

Culture and leadership

Management support. It is important that senior management constantly encourages innovation. Although management support is also critical in manufacturing firms, it appears that given the nature of services and the fundamental role of front-line personnel, managers of service firms are required to pay it even greater attention (Atuahene-Gima, 1996). During the development process, a manager should have a high degree of confidence in his employees, not blaming them for every mistake or wrong decision (Martin and Horne, 1995; Johne and Storey, 1998).
De Brentani (2001) states that it is important to provide leadership to stimulate moving into 'uncharted areas'. A manager who is committed to innovation encourages creative behaviour and the development of ideas, not only by emphasising the importance of innovation in words, but also by setting examples with his own actions (Debackere *et al.*, 1998). Suppose, for example, that a manager does not have the time or patience during daily activities to listen to ideas from employees and does not make time and funds available to work out these ideas. This will result in a poor climate that is not supportive to innovation.

Open culture. Having an open culture within the firm is generally considered to be relevant for a supportive climate. Developing innovative services that involve new service concepts, delivery systems, client interfaces and/or technological options, requires a corporate environment that encourages and supports openness, creativeness and 'stepping out' beyond the norm (De Brentani, 2001). Above all, senior managers play a key role in stimulating an open culture. It is important that they share their ideas with employees, stimulate communication within the organisation and provide leadership to motivate employees to move into uncharted areas (Johne and Storey, 1998).

Internal communication. An important dimension of organizational culture is whether information is shared or protected. Open cultures provide better support for the exchange of ideas (Lievens and Moenaert, 1994). The spreading of the information within an organization is relevant for creating a climate supportive to innovation. A large diversity of information affects the idea-generating ability of the workforce (Oden, 1997).

It also improves the problem-solving capacity of the firm, preventing mistakes from being made in future projects (Van der Aa, 2000).
Problems of communication between various functional specialists can slow down and decrease the success of innovative activities (Vermeulen and Dankbaar, 2002). In this context, Vermeulen (2001) discusses the role of 'occupational thought worlds'. In larger firms, people working in the same department tend to have more or less similar backgrounds (education). When they work together for some time, they usually develop thought worlds or mental models that consist of perceptions of what the world is like. These mental models are specific for a group of people and are distinct from other groups in the organization. Effective communication is necessary to bring different thought worlds together. Vermeulen considers this necessary for innovation to occur. The confrontation of thought worlds enhances creativity and increases problem-solving capabilities. These are important aspects of a climate that is supportive to innovation.

Autonomy of co-workers. In an organizational culture that stresses autonomy, employees are allowed to do their work freely and independently. They can choose their own approaches as to how to do their work. According to Prakken (1994), decentralisation of decision-making power enhances idea generation. Besides, participatory work environments facilitate innovation by increasing the employees' awareness and commitment. In service firms, the amount of autonomy that is perceived by co-workers is directly related to their innovative efforts (De Jong and Kemp, 2001).
Dougherty and Hardy (1996) also argue in favour of substantial autonomy for employees. According to them, centralised structures and processes are geared towards maintaining the status quo. This is in opposition to innovation, because it creates a hostile climate with respect to creativity and motivation for change.

Strategy

Business vision. A business vision provides direction for the activities that a company will develop in the future. A vision is usually defined by the entrepreneur or by senior management. Drew (1995), Ennew and Wright (1990), Hodgson (1986) and Thwaites (1992) all stress the need for a clear corporate vision concerning the role NSD is to play in business development. In somewhat larger companies, a business vision is usually translated into a formal mission statement. The difference between a mission statement and traditional business goals lies in the fact that a mission lacks quantitative and time-related elements. Bart (1996) mentions that a mission statement plays a significant role in influencing and encouraging employee behaviour within an organization. He concludes that a firm's innovative ability expands when the mission statement incorporates the notion of innovation, and when the company communicates this mission statement to its employees in a clear and forceful way. In small companies a formal mission statement is usually lacking, but senior management should still be able to communicate vision in general terms.

Innovation objectives. Johne and Storey (1998) and Easingwood (1990) stress that clear goals must be set for the NSD programme as a whole. This prevents a waste of resources when ideas are screened and evaluated in the search stage. Besides, it keeps every one who is involved on track. Fischer *et al.* (1993) mention that the innovation objectives should be clear and communicated to every co-worker. The presence of innovation objectives in the firm's strategy is an important antecedent of the innovative behaviour of co-workers (De Jong and Kemp, 2001).

Fit with overall strategy. New service efforts should fit in the overall strategy of the firm. The resources and expertise required for a new service should, ideally, already be

available in the firm in all major functional areas (Johne and Storey, 1998). Any new service should be part of a well-thought out strategy for a clearly identified target market and be considered to be important for the company's future. The key question is: are the innovation objectives in line with the long-term business objectives and do they offer a route by which the firm can achieve a competitive advantage?
For innovation objectives, ensuring that there is an excellent fit with the overall strategy and thus the resources of the developing firm is highly advantageous. This may seem obvious but De Brentani (2001) shows that, in many failed projects, new services did not fit with the current strategy.

Company characteristics

Technological synergy. In manufacturing firms, technological synergy seems important for innovation success. A high degree of technological synergy leads to benefits such as lower development costs, reduced error, and increased development speed. The relationship between technological synergy and innovation success is not clear to service firms. One could argue that the advantages mentioned above apply to service firms as well. On the other hand, new services that do not fit current technology could also be successful, because competitors are less likely to have similar knowledge and skills available (Atuahene-Gima, 1996).

Firm size. The influence of firm size on innovation success is ambiguous. On the one hand, larger firms are reasoned to be more innovative than smaller firms because the available resources are larger and the risk of failure for the company as a whole is less. Also, larger firms have more lines of activity and therefore more areas in which to innovate (Hipp *et al.*, 2000). So for service firms, a climate supportive to innovation is expected to be found in larger firms.
On the other hand, smaller firms tend to be more flexible than larger companies. Compared to larger-sized firms, smaller companies are less bureaucratic, so daring ventures are not blocked by a highly structured organisation. It is easier to get smaller organisations excited about an innovation (De Brentani, 1995).

Complexity of service design. A highly complex service design is a way to protect a company's knowledge. A complex design unites intense knowledge and experience, not only in the field of technology but also knowledge of customers, markets, delivery processes, etc. It is difficult for competitors to copy such service designs. As a result, the service company creates a temporary monopoly and can gain more benefits from an idea, the so-called first-mover advantages, positively influencing innovation success. Arvantitis and Hollenstein (1994) accepted this hypothesis for manufacturing firms. For service firms, MacMillan *et al.* (1985) state that radical new services are copied slowly. Highly complex services which require specialized skills have a long response lag.

4.3 External conditions

This section deals with the part of innovation success that can be managed only in an indirect way or not at all (by service managers). Many external conditions affect the results of innovative activities by service firms (Edgett and Thwaites, 1990). Our discussion includes market conditions, the knowledge infrastructure and government policies (table 7).

table 7 External conditions affecting innovation success in service firms

Market conditions	*Knowledge infrastructure*	*Government policy*
- Non-price competition	- Public knowledge infrastructure	- Appropriability
- Technological change	- Private knowledge infrastructure	- Taxes and subsidies
- Demand-pull		- Other policy instruments

Source: EIM, 2002.

The growing role of service industries in the economy suggests that government policies need to take more account of the special characteristics of the services sector (OECD, 2000). Successful innovation in service firms will be affected by a policy approach that is adapted to the nature of services. Innovation success of service is also affected by a country's knowledge infrastructure. As far as government policy and knowledge infrastructure are concerned, service firms may attempt to be of influence by enlisting sector organizations and lobbyists. When looking at market conditions, there is usually no possible influence at all. Thus, the bottom line is that part of the innovation success by service firms will always remain uncertain.

Market conditions

Non-price competition. Drew (1995) identifies economic conditions as one of the main barriers to innovation success. In manufacturing, service firms operating in markets with a lack of price competition are usually following a differentiation strategy. This gives rise to a greater number of innovations (Arvantitis and Hollenstein, 1994). This probably applies to service firms as well for two reasons (De Jong and Kemp, 2001). First, in markets with less price competition firms continuously want to differentiate their services from those of their competitors. Because they compete with each other on issues such as service characteristics and advertising, innovation will be boosted. Second, in markets without price competition, profit margins tend to be more attractive. This decreases the risks when innovative efforts fail.

Technological change. Technological change can affect the production and distribution of services as well as the demand for services from client industries (Kox, 2002). Some parts of the service sector, such as software houses and engineering, themselves form a driving force in technological development. In section 2.5, we labelled these firms as specialised suppliers. They usually support innovations in client firms by providing technological knowledge, unlike other companies within the service sector that deliver non-technological innovations. Technological change has a significant effect on the average length of the life cycles of services. For some markets, the life time of services is rather lasting (like haircuts). For other markets, the life time is very short and services are continuously replaced by others (such as computer software).

Demand pull. A high degree of demand pull is characterised by a high degree of demand growth. The demand growth seems to have a positive influence on the probability that a firm is innovative (Mowery and Rosenberg, 1979). For service firms, market attractiveness (size, growth) is an important antecedent of successful innovation (Edgett, 1994; Storey and Easingwood, 1995; De Brentani and Ragot, 1996). When demand is low, innovative service firms often feel they are slowed down in their activities by the reluctance of clients to accept new services (Preisl, 1998). When demand pull is low many service firms will not be motivated to invest in NSD.
In the past decade, a large part of the European service industry growth was the result of outsourcing decisions of client industries (Kox, 2002). An important question is whether this pattern is to be continued in the next decade. Further outsourcing will improve the opportunities for service firms for successful, client-driven innovations.

Knowledge infrastructure

Public knowledge infrastructure. The public knowledge infrastructure consists of universities, research institutions, sector organisations, etc. (Statistics Netherlands, 2000). A diverse public knowledge infrastructure that is of high quality provides service firms with several advantages, such as the access to relevant information and knowledge, public programmes to help firms to cope with problems in the NSD process, and subsidies for development efforts.
Moreover, innovation in services can originate from basic knowledge that is built in the public knowledge infrastructure. In this regard we mean opportunities created by general technological and research activity. This is widely recognized for manufacturing firms (e.g., Beije, 1989; Baldwin *et al.*, 1998), but for service firms, this relationship is less researched (although we can mention numerous examples, for instance, e-commerce services are eventually the result of the foundation of the World Wide Web).

Private knowledge infrastructure. Miles *et al.* (1995) describe the option of acquiring knowledge-based products and services from so-called knowledge-intensive business services (KIBS). These firms are defined as private companies relying heavily on professional knowledge, and supplying intermediate products and services that are knowledge-based (Den Hertog, 2000).
A high-quality private knowledge infrastructure provides service firms with several advantages. It can be helpful in stimulating innovation in service firms not only by providing explicit knowledge, but also by the transfer of tacit knowledge (Miles *et al.*, 1995). Tacit knowledge essentially represents 'know-how' (e.g., knowing how to drive a car). It is highly personal and difficult to transfer to client firms. It can often only be acquired through practice and experience (Polanyi, 1967).

Government policy

Appropriability. Several studies claim that the ad hoc nature of the innovation in service firms is also due to the weak appropriability regime for most services (e.g., Sundbo 1997). As mentioned, service innovations can easily be copied from competitors. Baumol (2002) estimates that less than 20% of the total economic benefits of innovations go to those who invest directly or indirectly in making them happen. Thus, individual service firms are stimulated to innovate if appropriability can be better ensured.
Firms that attribute high importance to the protection of their innovations work with registered trade marks, and use copyright laws as well as data-protection laws against unwarranted imitation, but they generally find that these means are hardly adequate (Preisl, 1998). Firms providing services can use other means of appropriating the benefits of an innovation (Andersen and Howells, 2000). For instance, tangible features can be added to services in order that they can be better protected. Likewise, the information collected in the past about a customer and his preferences can be brought to bear when a new service encounter occurs, increasing switching costs (Dolfsma, 2001).
Government policy plays a key role by enlarging the possibilities for appropriability. The possibility to patent business models in the United States is a hotly debated example (Berentsen, 1999). Copyright is being continuously expanded in terms of scope and duration (Lessig 1999; Lessig, 2001; Franken *et al.* 2002). While these changing legal opportunities for appropriating the benefits of innovations might not be in the general interest (Dolfsma and Soete 2002; Dolfsma 2002), they do seem to benefit the innovative firm, at least in the short run.

Taxes and subsidies. Government can stimulate innovative activities by granting tax reductions or subsidies on innovative activities. In manufacturing firms, this seems to stimulate innovation (Geroski *et al.*, 1998). Taxes and subsidies are hardly available for

service firms. Innovation policy tends to focus on innovations in high-technology manufacturing industries. For instance, R&D tax credits are of greater relevance to manufacturing than to services (OECD, 2000).

Other policy instruments. Governments can promote innovation by means of communication and support programmes for service firms. The public knowledge infrastructure (see above) can be employed to build and diffuse this kind of knowledge. In this context, OECD (2000) stresses the following policy instruments:

- Government could promote an innovation culture in service firms by creating favourable framework conditions and encouraging firms, both large and small, to adopt best practices in innovation. In the Netherlands, the Syntens organisation is funded by the Ministry of Economic Affairs to inform and advise Dutch firms on innovation subjects.
- Government could be a demanding customer and innovative provider. The public sector is an important purchaser and provider of services. Since innovation in services is closely linked to sophisticated customer demand, governments can promote service innovation by being a demanding buyer. In sectors where government remains a major provider, such as health, education and social services, it could become a more sophisticated and innovative provider.
- Data collection. Innovation in service industries continues to be poorly covered in most basic statistics. To further improve understanding of service processes and innovations, better and more comprehensive data should be gathered.

Some final remarks

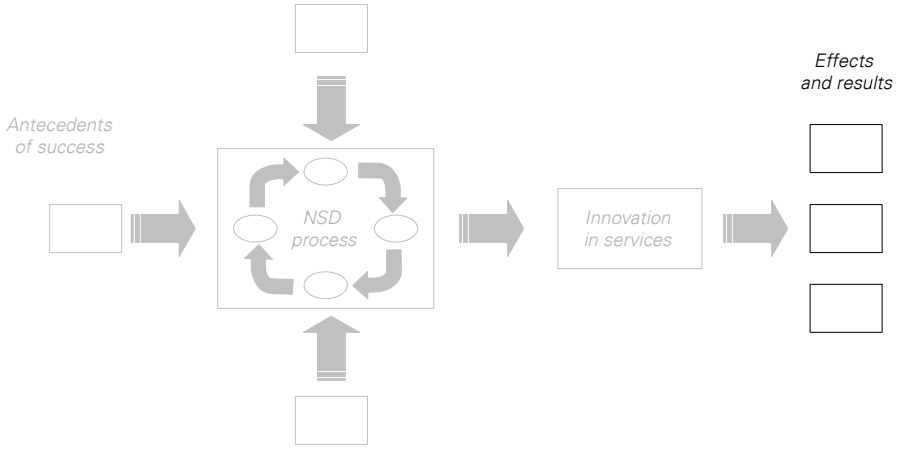
Above, we presented a long list of factors that affect innovation success in service firms. In practice, some success factors overlap each other to some extent. For example, it will often be the case that a service firm with an organisation structure that is optimal for innovation will also have a culture strongly supportive of innovation, and vice versa. Although some of the antecedents cannot be influenced at all, a relevant question to service managers is where they should start. This question is still difficult to answer. Although some researchers have investigated the effects of many success factors at once (e.g., Atuahene-Gima, 1996; De Jong and Kemp, 2001), the success factors discussed above have not been tested integrally as yet. In chapter 6 we elaborate on this.

5 Results of innovation in services

5.1 Introduction

Why do service firms actually innovate? The amount of literature which focuses on the effects of innovation in service firms is surprisingly low. Many studies on the effects of innovation focus on manufacturing (e.g., Loof *et al.*, 2001; Arvantitis and Hollenstein, 2002). At best, service industries are identified as one single aggregate industry (e.g. Statistics Netherlands, 2001). This is odd, since service industries are of a very different nature (Suijker *et al.*, 2002). This lack of attention for services is partly due to the fact that services are usually poorly covered by innovation statistics (OECD, 2000).
In this chapter we discuss the most important effects and results (figure 11).

figure 11 Content of this chapter



The most direct effect of innovative efforts by service firms is the market launch of new innovative services. Section 2.3 revealed to what dimensions service innovations can be related (changes in the service offering, delivery system, client interface and/or technological options), and what types of innovation the NSD process can result in.
This chapter deals with the consequences of having introduced new services. We argue that service innovation eventually is about financial and non-financial gains. Apart from financial benefits, literature reveals two other benefits for service firms: creating customer value and increasing strategic success (see section 5.2). After dealing with the impact of service innovation on the firm, we discuss the impact of service innovation on the more aggregate levels of the market and the economy as a whole (section 5.3).

5.2 Effects at firm level

Benefits of innovation in services are threefold

The effects of innovation in service firms can be both financial and non-financial. In performance measurement, both these indicators are promoted (e.g., Kaplan and Norton, 1993). However, due to the nature of services (intangibility, heterogeneity), the impact of service innovations is harder to trace than in manufacturing. Service innovations typically transform the state of customers (Tether and Metcalfe, 2001). Their perception of service quality is an important antecedent of economic rewards (e.g., Narver and Slater, 1990). At firm level, the results of innovation in services are rather straightforward and

do not seem to differ much from those in manufacturing. The impact can be threefold (cf. Tidd *et al.*, 2001):
– financial benefits
– increased customer value
– strategic success.

Financial benefits. As discussed by Schmookler (1962), profit-seeking firms determine whether ideas and inventions can actually be turned into innovations. And as long as the implemented innovations may be expected to pay off, firms will act upon them and persist in innovative activities.
There is no doubt that having financial success depends on innovation. Research evidence suggests a strong correlation between market performance and innovation (Luchs, 1990). It is likely that service firms are no exception to this (Kelly and Storey 2000; De Brentani, 1989). Innovation in general, and in service industries in particular, seems to lead to better company performance in terms of revenue growth (Klomp and Van Leeuwen, 1999). In the case of more mature and established services, sales growth comes not simply from being able to offer low prices but also from a variety of non-price factors, such as design and quality (Baden-Fuller and Pitt, 1996). Thus, innovation seems to entail financial benefits during all stages of a service's life cycle.

Increased customer value. Service innovation typically results in increased customer satisfaction and loyalty (relationship enhancement). Both are concerned with the direct attributes of the service offering, but also with the image of its supplier, and with the relationship that the supplier and the customer have. Typically, service innovation is about transferring (non-physical) attributes to better satisfy customer needs. This will eventually have an impact on the financial results because of repeat purchases by the customer, and because of recommendations to other potential customers (Narver and Slater, 1990).

Strategic success. In most firms, innovation is among the enablers of strategic success (De Brentani, 1989). For firms in general and service firms in particular, competitive advantage used to come from low prices and high quality. Nowadays, it increasingly depends on innovative activities (Kay, 1993). Being able to provide innovative services - faster, cheaper, higher quality - is a source of strategic success. For instance, in financial services, Citibank was the first bank to offer the ATM-type of service and developed a strong market position as a technology leader (Dodgson and Rothwell, 1995). Southwest Airlines achieved an enviable position as the most effective airline in the USA despite being much smaller than its rivals; its success was due to innovation in areas such as reducing airport turnaround times (Pfeffer, 1994).

Effects depend on external conditions

In section 4.3, we discussed that external conditions affect the development process of new services. External conditions will impact the pay-offs of innovative activities as well. This applies particularly to market conditions. By definition, the results of innovation are temporary and uncertain (Afuah, 1998; Johne and Storey, 1998). Technological change, further innovation by competitors, changing customer preferences and other market developments will eventually end the economic life of any service.
To better reap the benefits of service innovation, a service firm can initiate various strategies, for instance (cf. Afuah, 1998):
– Blocking (a service firm may appropriate the benefits of innovations by hiding the innovation behind company walls, by applying for patents, by way of copyright pro-

tection, etc. In section 4.3, we discussed that the legal possibilities to appropriate service innovations are still limited).
- Running (a service firm may keep competitors at a distance through continuous innovation and renewal. Constantly refreshing service concepts, delivery systems and client interfaces may be needed to maintain a competitive edge. However, this can result in the cannibalisation of one's own services as well).
- Teaming up (this concerns teaming up with suppliers, customers and competitors; for instance, by licensing or winning the standard. For larger firms, in particular this third strategy will be close to the edges of competition law. A very recent example is Microsoft).

Afuah (1998) states that it will essentially take combinations of these strategies to maximize the returns on innovation. But eventually, market conditions (the dynamic context) partly determine whether and to what extent individual innovations pay off.

5.3 Effects at the market level

Market opportunities and challenges are a direct incentive for service firms to reshape a service offering. Besides, market characteristics partly determine if innovative activities pay off (as discussed above). Reversely, we argue that innovation in services will have an impact on market conditions as well. For instance, it may affect demand conditions. Especially when new client interfaces are involved, the (buying) behaviour of customers changes. The introduction of the Internet in financial service, for instance, has caused many customers to trade stocks and bonds online.
Other suppliers will also be inclined to adopt similar measures to maintain competitiveness. This applies particularly to service firms, where many innovations have a 'me-too'character (e.g., Easingwood, 1986; Hooley and Mann, 1988; Scheuing and Johnson, 1989).

Impact on market conditions may be threefold

Assessing the full impact of service innovation at market level is difficult, because it may impact markets in a wide range of areas. We hypothesize that at market level their effect may be threefold: changes in the supply conditions, the trade mechanism and the demand conditions (table 7).

table 8 Potential impact of innovation in services at market level

Supply	*Trade mechanism*	*Demand*
– Seller-power distribution	– Price and quality	– Buyer-power distribution
– Entry and exit	– Transparency	– Entry and exit
– Dual/linked markets	– Transaction costs	– Substitutes
– Value chain		– Collusion

Source: EIM, 2002.

Impact on supply conditions. As in manufacturing, innovation in services may have consequences for the distribution of power between sellers in the market. Series of incremental or incidental radical innovations impact the competitive position of major players (e.g., Henderson and Clark, 1990).
Besides, innovation in services can trigger new entry and exits. Over time, innovation may offer new strategic incentives to both new start-ups and existing firms from other sectors which may enter the market (Abernathy and Clark, 1985; Foster, 1986; King and Tucci, 2002). Likewise, existing competitors may be triggered to exit the market.

Another effect may be that innovation in services can create or (conversely) disconnect dual and otherwise linked markets. In particular innovations that are initiated by suppliers (mentioned as 'supplier-dominated innovations' in section 2.4) or that change the operation of users' transformation and production processes ('innovation through services') impact dual markets. Natural linkages between products and services from various suppliers may be born or may die due to innovations introduced (Henderson and Clark, 1990). An example of this effect includes the (future) introduction of UMTS. This links the telecommunications sector with Internet service providers.
As an extreme consequence, the entire organization of supply (the value chain) may be altered. We expect that this is particularly the case with 'paradigmatic' innovations (see section 2.4). This type of innovation implies that suppliers, clients and the service firm itself co-operate to develop a new service offering.

Impact on trade mechanisms. Innovation in services can be expected to have an impact on the level of market prices and qualities. In textbook terms, innovation causes shifts in demand and/or lowers or shifts cost curves. We assume this applies to service firms as well.
It is likely that the transparency of prices and qualities will be altered as well. Due to the heterogeneity of services, and especially since many service innovations are strongly linked to the exchange of information, the transparency of prices and qualities is likely to be altered. For instance, many ICT-based service innovations improve the transparency of markets because of increased exchange of information and/or just-in-time deliveries.
Finally, we hypothesize an impact on the transaction costs involved with trading in a service market. For example, in retail stores the introduction of electronic payment systems has reduced the time customers have to wait to pay their bill.

Impact on demand conditions. Innovation in services may impact the power distribution between the buyers in a market. The willingness of customers to adopt innovations is critical in the influence they may have (e.g., Henderson and Clark, 1990). Similar to changing supply conditions, series of incremental or incidental radical innovations can change the competitive position of important customers in the market. For instance, in the past ten years financial service firms have become more dependent on ICT services. Many of their delivery and work processes are now streamlined by means of information technology.
Service innovations can trigger the entry and exit of customers. Particularly revolutionary and radical innovations are bound to create waves of entry and exit of customers alike (Abernathy and Clark, 1985). For instance, in telecommunications, the introduction of SMS services has created a new market of young adults.
Furthermore, innovation in services may make particular substitutes relevant or (conversely) obsolete. For example, the introduction of e-mail has devastated the demand for fax and telegram services.
Finally, changes in the incentives to co-operate can appear. Because new opportunities for co-makership arise, collusion incentives of the market alter (Tushman and Rosenkopf, 1992).

Impact on economic growth

A recent discussion among policy makers focuses on the effect of innovation in service firms on economic growth. The conventional view on economic growth is due to Solow (1957). In the Solow model, capital accumulation, labour-force growth and technical progress are the fundamental sources of economic growth. Economic growth can occur through growth in *levels* of capital inputs or labour inputs ('stock'), and through the

growth in *productivity rates* of the aforementioned inputs. Technical progress typically deals with the latter (growth in productivity).

Aghion and Howitt (1992) stress that breakthroughs in technology create significant discontinuities in industrial evolution and growth. These discontinuities can create so-called 'spurts of growth'. Conceptually, a special case of the historic 'spurts of growth' has been identified as the so-called 'general-purpose technologies' (Bresnahan and Trajtenberg, 1995). Such technologies have the potential for pervasive use in a wide range of sectors. They drastically change the modes of business operation and, therefore, create a potential for widespread growth (e.g., the electromotor). Theoretically, this is one of the reasons to link innovation in services to permanent shifts in economic growth (Aghion and Howitt, 1992; Helpman and Trajtenberg, 1998).

Research evidence of service innovation contributing to growth is still very limited. We elaborate on this in section 6.3.

6 Overview of findings

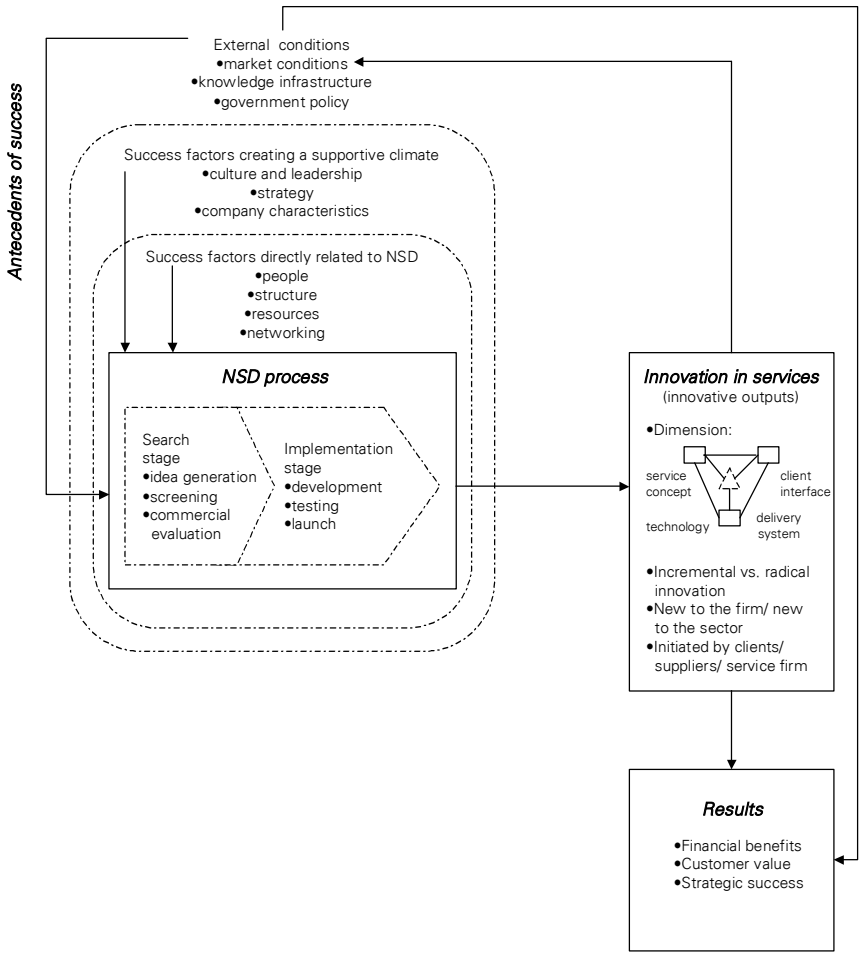
6.1 Introduction

This study aimed to provide an overview of the literature on innovation in services. We explored what innovation in service firms is about, how it happens, and for what reasons service firms should innovate. The literature on innovation in services can be integrated in a conceptual model presented in section 6.2. This model can be used to digest the subject of innovation into the service literature. It serves as a summary of literature for business students and other researchers. As presented in chapter 1, we highlight the implications for service entrepreneurs/managers. These implications are useful for anyone who acts as advisor, for instance business consultants. Moreover, at the end of section 6.2 we present an overview of the major differences between innovation in services and manufacturing.
We discuss the limitations applying to our study and make recommendations for future research in section 6.3.

6.2 An integrated model to summarise our findings

It is difficult to distinguish services clearly from manufactured products. It is more useful to think about services and manufactured products as the extremes on a continuum. Generally, services tend to be more intangible, simultaneously produced and consumed, heterogeneous and perishable (cannot be kept in stock). Chapter 1 explains that a concise overview of the current insights in innovation in service firms is still lacking. The literature can be summarized in a conceptual model, which can be used to describe innovation in service firms. The new service development (NSD) process is at the heart of this (figure 12).

figure 12 Conceptual model to describe innovation in service firms



An explanation of figure 12, using our research questions as a guide follows. For each research question we summarise our findings. Next, we discuss the most important differences with innovation in manufacturing and elaborate on the implications for service entrepreneurs and managers (hereafter: service managers).

What is innovation in service firms?

Innovations in service firms can be radical or incremental ... Like innovation in manufacturing, innovative output in service firms can range from a totally new, discontinuous innovation to a simple line extension or minor adaptations/adjustments that are of an evolutionary nature (incremental vs. radical innovations). Apart from the degree of novelty, innovations can be new not only to the service firm itself, but also to the sector and/or the outside world.

... while related to four dimensions ... The usual distinction between product and process innovations does not apply. As production and consumption are simultaneous, product and process innovations usually coincide. Instead, innovative output in service firms can be characterised by changes in (1) the service concept, (2) client interface, (3) delivery systems and (4) technological options. Supplying examples for the extremes of these dimensions is difficult. In practice, new services are a mixture of these four dimensions.

… and be developed and implemented by various parties. In service firms, innovations can be initiated and implemented by various actors, such as clients, suppliers and the service firm itself. Their roles can be used to define different types of innovations, in each of which the actors play a different role:

– Supplier-dominated innovation (initiated by suppliers, and implemented by the service firm itself)
– Innovation within services (initiated by and implemented by the service firm itself)
– Client-led innovation (initiated by clients, implemented by the service firm)
– Innovation through services (initiated by clients and/or the service firm, implemented by the client's firm)
– Paradigmatic innovation (all actors in the value chain fulfil a key role in initiating and implementing the new service).

Some of these types of innovation are more common in particular service sectors. For instance, 'supplier-dominated innovation' is very usual in personal services (such as hairdressing), hotels and restaurants, and retail trade. In sectors such as financial services, transport and wholesale we expect to find many examples of 'innovation within services' and 'client-led innovation'. Finally, in knowledge-intensive sectors like bookkeeping, engineering and management consultancy, we expect 'client-led innovation' and 'innovation through services' to be the dominant types of change and renewal.

How are innovations in service firms developed (NSD process)?

In practice, the NSD process tends to be informally organised … New services are easy to imitate and, because the technological component is often lacking, service managers do not always recognize when some change or renewal is actually an innovation. The development of new services is usually organised in an ad-hoc manner. However, if service managers think about the NSD process in a more structured way they can manage it more effectively and efficiently.

… but it can be structured as a two-stage process … The NSD process differs markedly from the process of developing new products. However, because the differences between products and services appear to be blurred (see chapter 2), one should not completely discard the insights from manufacturing. We propose a two-stage model to describe how innovations in service firms are actually developed. It is a simplified version of the activity-stage model that is found in manufacturing contexts:

– The NSD process starts with a so-called search stage. This divergent stage focuses on gathering and selecting ideas. Activities that have to be performed include idea generation, screening and commercial evaluation.
– The implementation stage in which promising ideas are transformed into concrete results follows. This stage includes the development of a new or renewed service offering, testing and market launch.

… in which the activities are not strictly carried out successively. Some differences with traditional manufacturing models include that our model does not divide the innovation process into distinct steps and, in addition recurring relations may occur between the activities described above. Activities are also allowed to overlap in time. The search stage is a more or less continuous process of idea generation (from frontline co-workers, customers, or other parties like suppliers or competitors) and assessing their suitability and economic potential. In the implementation stage the activities of development, testing and commercialisation can coincide as well. It is a recurring process of designing a service offering, selling/offering it to customers, gathering feedback from customers and front-line co-workers, making adjustments in the service offering, etc.

What are the antecedents of successful innovation in service firms?

Some antecedents are directly related to NSD success ... Some antecedents of innovation success are closely related to the NSD process: people, structure, resources and networking.

People are at the heart of successful NSD. The co-workers of a service firm have to generate innovative ideas, and develop, test and implement the new services. Structure relates to the activities in the NSD process, which should be organised and co-ordinated in the right manner. By resources we mean that innovation requires time and money, particularly in the implementation stage. Finally, networking is about the activities one should employ to identify market opportunities and new client wishes, and to test initial concepts of new services.

... while others create a supportive innovation climate ... Other antecedents tend to create a firm climate that is supportive to innovation. We can distinguish between: culture and leadership, strategy and other company characteristics.

An open culture with effective internal communication is generally supportive to innovation success. Effective knowledge transfer facilitates idea generation and a firm's problem-solving ability when implementing new services.

Strategic attention for innovation keeps a firm from viewing innovation as an ad hoc process and provides guidelines for the distribution of resources. Finally, other company characteristics that affect innovation success include technological synergy, firm size and the complexity of service design. We have learned that their effect is still ambiguous. In section 6.3 we discuss this.

... and some can barely be influenced. Service managers can influence part of their innovation success only in an indirect way or not at all. External conditions that affect the results of the NSD process include: market conditions, knowledge infrastructure and government policy.

When looking at market conditions, one could think of an environment that is characterised by non-price competition, strong technological change and a high degree of demand-pull. Here, service firms will find themselves easily triggered to develop and launch new services. Knowledge infrastructure relates to universities, research institutions, sector organisations and knowledge-intensive business services that may help service firms to innovate. Of course, policy makers could initiate changes here. This also applies to government policy, which is about the possibilities for appropriability, the existence of taxes and subsidies, etc.

What are the results of innovation in service firms?

Profit-seeking firms invest efforts in innovation in the anticipation of economic rewards. The NSD process can result in different types of innovative output, depending on the changes in the service concept, client interface, delivery systems and technological options. In the end, the impact of innovative efforts can be threefold: financial benefits, increased customer value and strategic success. Besides, innovation in services can result in changing market conditions. There is no doubt that when a new service proves to be successful in a particular sector, other service firms will follow.

Differences with manufacturing

One could debate the necessity to provide different guidelines for innovation in services as opposed to manufacturing. Indeed, we conclude that many of the traditional principles in innovation management are applicable to services. Many of the antecedents of innovation success, for example, seem to be copied from a manufacturing context (see Cooper and Kleinschmidt, 1987; Cooper, 1994).

However, service managers should pay attention to various items when trying to manage innovation better. In table 9 we summarise some main differences with innovation in manufacturing. For a further explanation we refer to our discussion in chapters 2-5. Next, we discuss some implications for service managers.

table 9 Summary of differences between innovation in services and manufacturing

Subject	*Differences with manufacturing*
Innovation in services/output	Technology is less frequently a dimension of change: new services are more often non-technological than in manufacturing. They require less or no R&D.
	The usual distinction between product and process innovations does not apply. Innovation in services is not limited to changes in the service offering ('product innovation'), since it usually involves changes in the delivery process and client interface as well ('process innovation').
	Innovations mostly involve small and incremental changes. Compared to manufactured products, the number of radical innovations is proportionally smaller.
NSD process	Some innovations in services are hard to recognize. They involve small and incremental changes, which make it difficult to recognize when a change is actually an innovation. This leads to a less formalised approach of organising NSD. Of course, some service sectors (such as banking and telecommunications) can be an exception to this, especially in large firms.
	Service firms usually regard NSD as an ad hoc process. They tend to invest less in fixed assets to support innovations. Again, some service firms such as banks and telecom providers are an exception to this,
	To describe the NSD process adequately, NSD activities should be allowed to coincide and overlap in time. This applies to both the search stage of the NSD process (idea generation, screening, evaluation) and the implementation stage (development, testing, launch).
Antecedents of success	Frontline employees fulfil a key role in the NSD process. A sound human resources strategy has a great influence on success. A lack of well-educated co-workers is a major barrier to innovation in service firms, more often than in manufacturing.
	The attitude of financial institutions towards helping service firms by financing innovation is determined by typical manufacturing innovations. Investment in innovative service concepts is not an asset banks are very willing to lend money against.
	Communication problems are a larger barrier to innovation success. For instance, the absence of a physical prototype and the difficulty of reproducing market conditions cause problems in testing new services.
	Service innovations are more easy to imitate. The analysis of competitors is an important determinant of innovation success.
	Reputation is crucial when introducing new services. Compared to manufactured products, peers and experts are even more able to make or break the success of a new service.
	Appropriability of new services is difficult or not possible at all. Service firms spend less money on buying patents and licenses.
	Services usually receive less attention from national governments that strive to stimulate innovative activity.
Results	Due to the nature of services (intangibility, heterogeneity), the impact of service innovations is harder to trace than in manufacturing.

Managers who believe that innovation is always related to technology find themselves deceived. The four dimensions of innovation in services (client interface, delivery system, service concept and technological options) can serve as a valuable tool for managers to recognize what innovation in their firm is about. Since technology is not always a di-

mension of change, it becomes clear that innovation in services is widespread and frequently present.
In particular service sectors, managers are likely to gain from investigating other types of innovation. For instance, in supplier-dominated sectors service managers should not just be passive recipients of other's inventions, but explore if and how they can improve their performance by initiating innovations themselves ('innovation within services'). Service managers can benefit from thinking about the process of NSD in a more structured way. Although NSD is a controllable event, the process itself should be rather flexible when it is implemented in a service firm. When attempting the more efficient management of innovation in services, managers should keep in mind that the involvement of front-line co-workers is crucial. NSD is a continuous process of development, testing with clients, and making refinements, and front-line employees fulfil a key role in this process. Managers should not apply too many rules and procedures. Multifunctional teams can be recommended to take care of the implementation stage. Besides, successful implementation requires time and money, and one should never underestimate the importance of a thorough pre-launch test and a sound market-launch strategy. Finally, strategic attention for innovation is a good thing. Co-workers need to know what kind of innovations will be considered valuable, and which means are at their disposal.

6.3 Limitations and suggestions for future research

Like every literature research, our study has various limitations, we discuss these limitations and make recommendations for future research.

Differences between service sectors. In chapter 1 we stressed that we would not account for differences between various service sectors. The services sector ranges from technology- and skills-intensive sectors such as software, computer and business services, to low-technology and low-skilled sectors that make up a large part of personal services. Following Johne and Storey (1998), we recommend that further research should focus on comparing NSD in different sectors. One could start by trying to map the principles of innovation in services for the three types of sectors we mentioned briefly in section 2.5: supplier-dominated, production-intensive and specialised service sectors. Business-to-consumer service sectors in particular, which are usually supplier-dominated (retail, hotels and restaurants, personal services), have still not been covered by researchers.

Testing causal relationships. In this study we limited ourselves to literature research and interviews. Although we presented a conceptual model to describe innovation in service firms (figure 12), no empirical test was performed to test the hypothesized causal relationships between the antecedents of innovation success, the NSD process, innovative outputs, and eventual firm performance. Future research could provide a decisive answer.

Empirical support for service dimensions. In this study we argued strongly in favour of Den Hertog (2000) who proposes four dimensions to describe innovation in services: changes in the service concept, client interface, delivery systems and technological options. In our opinion, these dimensions are very suitable to describe what innovation in services is about, but we must stress that Den Hertog's model (2000) has not been tested yet. Additional research should provide us with answers to the question whether these dimensions are empirically supported, or have diagnostic value only.

More types of innovation. By looking at the role of clients, suppliers and the service firm itself, one can derive five types of innovation in service firms: supplier-dominated innovation, innovation within services, client-led innovation, innovation through services and paradigmatic innovation (see section 2.4). By taking new variables into account, more innovation types can be identified. This might be particularly important should one be trying to construct a typology for a specific service industry. For instance, when supplier-dominated innovation is the prevailing type of innovation for a group of service firms, a manager may be helped by a typology that differentiates between various types of supplier-dominated innovation.

Alternative representations of the NSD process. Our two-stage model for new service development is a generalised version of the activity-stage model, which is quite often used in a manufacturing context (for instance Booz *et al.,* 1982). Future researchers could also follow a different approach by completely discarding manufacturing literature. Should someone start an explanatory research, he/she could propose quite a different model to describe the NSD process (e.g. Van der Aa, 2000).

Importance of the antecedents of innovation success. There is a long list of factors affecting innovation success. We derived this overview from both economics-oriented and business-oriented literature (Brown and Eisenhardt, 1995). A relevant question for service managers is where they should start. Although an impressive amount of research has focused on the importance of success factors, we did not find any studies which integrated all success factors (integrally covering both research traditions). Here, we can only stress that successful innovation can rarely be explained in terms of managing only one or two success factors brilliantly (Johne and Storey, 1998). A host of important supporting activities needs to be managed competently and in a balanced and well-coordinated manner to improve the results of innovation in service firms. It seems that service firms should first deal with a supportive innovation strategy and the aspect of leadership (De Jong and Kemp, 2001), but more research is needed.

Effect of company characteristics on innovation success. Company characteristics that affect successful NSD include technological synergy, firm size and the complexity of service design (section 4.2). We have learned that their effect is still ambiguous. For instance, a high degree of technological synergy could be beneficial because of lower development costs, but also disadvantageous because competitors will find it more easy to imitate these kinds of service innovations. Further research is recommended to investigate how these factors correlate with successful NSD, and under which circumstances.

Results of innovation for the firm. The amount of research focusing on the effects of innovation in service firms is surprisingly low. Many of these studies focus on manufacturing. At best, service industries are identified as one single aggregate industry. In this context, Johne and Storey (1998) stress that objective procedures to evaluate NSD success are still lacking. Future research should explore the consequences of service firms being innovative. When doing so, it should account for sectoral differences as well.
Lack of attention is partly due to services not being fully covered by innovation statistics (OECD, 2000). This may be due to the fact that there is not much literature as yet on measuring innovation in services. Researchers should feel challenged to find new indicators for innovation which are applicable to both manufacturing and services.

Results at market level. In chapter 5 we discussed some effects of innovation in services at market level. These effects are still hypothetical. Research evidence of service

innovation contributing to growth is limited. Because technological progress is only one dimension of service innovation, and not a necessary component, we can expect that the contribution of service innovations to growth will not be extreme. Labour-intensive as most services are, innovation through investment in physical capital may have a limited scope for productivity growth. Traditionally, productivity growth in services has been slower than in manufacturing industries, although sector differences across service industries can be large (Pilat, 2001). However, developments in the service sector are considered to be the key to economic growth in the future (OECD, 2000), especially since the share of services in economic activity is still consistently growing for virtually every western economy. This will be the subject of much debate in the near future, and there is no doubt that economic research will help to provide a firm answer.

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