

The Role of Service Characteristics in Service Innovations

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Abstract

Starting from the earlier service definitions and generally accepted service characteristics, we discuss the theoretical perspectives for studying service innovations. Based on these considerations, we then propose a new definition of service innovation that as a first definition takes service characteristics explicitly into account in addition to innovation characteristics. This is essential because service characteristics are usually taken points of departure when creating service innovations. Thereafter, we exploratorily study the content of our innovation definition on the basis of four empirical case examples. Finally, we suggest several conclusions and viewpoints for future research.

Keywords *service definition, service characteristics, service innovation characteristics, service innovation definition, case examples*

1. Introduction

In the developed countries the share of services in GNP has increased to 75 per cent or more and the growth is expected to continue in future. The growing service sector has succeeded better than other industries. Service innovations are utmost

important issues in continuing this development.

Ostrom et al. (2010) have presented a number of global, interdisciplinary research priorities for the service science based on an examination of academic service research and interviews with experts and executives working in the field of

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services. One of these priorities is to stimulate service innovations, which actually is also one of our background objectives in this article. The realisation of the objectives of this article also deals especially with enhancing service design, as well as measuring and optimising the value of service.

In principal, the impact of service innovations is close to the impact of goods innovations: both types of innovations usually increase efficiency, decrease costs, create new activities and open new avenues to markets. In addition, the importance of services as a part of industrial products has increased. However, Hipp and Grupp (2005) argue that innovations in service industries seem to be difficult to explain in terms of traditional innovation theories and typologies. This can be interpreted so that service innovations deviate from product innovations even though the line between goods and services is generally diminishing, and thus also services are partly services and partly goods.

Technology is utilised in service innovation and development increasingly often. van der Aa and Elfring (2002) even argue that through a new technology new services have been discovered. Yet research is still sparse on how technology changes the characteristics of services (Järvinen & Lehtinen, 2005). Therefore, we limit the empirical perspective of this article to technology-based services and e-services. The term technology-based services usually covers e-services but in this article we make a distinction between services that utilise technology in their production processes and services utilising electronic channels in their delivery processes.

A lively debate over service characteristics started in the late 1970s, but after the first stages very little has occurred in this area. Some scholars (e.g., Lovelock & Gummesson, 2004; Vargo & Lusch, 2004a; 2004b) have presented justified criticism against some of the earlier statements. They have even claimed that adhering to the earlier tradition prevents the birth of fresh ideas in service marketing literature and research. Lovelock and Gummesson (2004) pay attention to information technology and its impact on the content

and characteristics of services. They conclude that there is insufficient research to demonstrate these effects.

The main objective of this article is to introduce a new definition of service innovation that, in addition to innovation characteristics, takes the most typical service characteristics explicitly into account. This is essential because service characteristics are the natural points of departure when examining and creating service innovations. So far, service characteristics are dealt with in diminutive extent when defining service innovations. The empirical objective is to examine and interpret four case examples especially from the perspective of the proposed definition. Two of the examples are technology-based service innovations and two of them are electronic services. This is because most of the novel services nowadays utilize either technology development or electronic environment or both.

The article is organised as follows. After the theoretical part dealing with service concept, service characteristics and service innovation we will present an empirical examination of the manifestation of the main service characteristics. Finally, we will discuss about the results and suggest guidelines for future research.

2. Service Definition and Characteristics

In the article by Ostrom et al. (2010) the very first research question is: "What is an ideal service concept?" This complies with our belief that service definitions and service characteristics are essential when examining, creating and utilising service innovations.

General discussion about services started from Adam Smith's "The Wealth of Nations" (1776), and still continues even today. Consequently, there are many different definitions of services and many different conceptions of essential service characteristics. Any service definition and conception is more or less problematic. Finding an ideal definition and a corresponding list of characteristics

is very difficult, if not impossible. Therefore, we have to start with some reasonable definitions and corresponding characteristics. Our choice is the service definition by Lehtinen (1984):

‘Service, actually a service-like marketed entity, is a benefit providing object of transaction that is a more or less abstract activity or process of activities essentially produced, marketed and consumed in a simultaneous interaction.’

The above service definition by Lehtinen (1984) contains four basic characteristics usually connected to services, namely: 1) abstract nature, i.e., intangibility, 2) process nature, 3) the simultaneousness of production, marketing (!) and consumption which is called inseparability, and 4) the interactive nature. The focus of this article is particularly on these four characteristics. Then we provide our conceived reasons for abandoning some other commonly proposed service characteristics. We underline that the scope of the service definition is quite wide because two of the characteristics of the definition are general and actually compulsory parts of any service definition and the third characteristic is “essentially” limited. The fourth characteristic, on its part, refer to traditional personal services that are provided face-to-face.

We consider that the discussion on service characteristics is of highest importance as the content of service concept can be defined properly through these characteristics. Even Grönroos (1991) reminds that it is more useful to examine service characteristics than to attempt to create the most perfect definition of services. Any way, innovation in general could and should be planned through these basic characteristics, even though their emphasis varies according to the service type.

Services are generally considered *intangible* by nature. However, no services are purely intangible. Even the most abstract services, such as financial services (cf. Järvinen, 1998; Ahonen, 2005; Nordman, 2004), are often made more tangible through various written documents. Zeithaml,

Parasuraman and Berry (1990) have identified tangibles, such as physical facilities, equipment, personnel and communications material, as one of the key dimensions of service quality. On his part, Lehtinen (1984) suggests the terms ‘service-like’ and ‘goods-like’ to be used to describe whether one is dealing either with an entity consisting mostly of intangible elements of services or with an entity consisting of mostly tangible goods.

Most services consist of various *processes*, which the providers and customers have to follow. These processes are especially important when using technology-based and e-services; otherwise the whole service system does not function well. So far technical devices and ICT-systems cannot treat customers as individually and flexibly as traditional service encounters.

Inseparability of production, marketing and consumption is linked to interaction during the service encounter. By using inseparability as a criterion, services may appear as markedly different from each other. Depending on the service, it may be produced, marketed and consumed either simultaneously or separately. However, there are services that do not necessarily follow the inseparability logic. For example insurance services are often marketed and produced separately. When an insurance policy is underwritten, insurance consumption, i.e., the experience of security, starts and lasts for the entire insurance policy period (e.g. Ylikoski & Järvinen, 2011). Many, but not all, banking services follow the same mode.

Interaction between customers and providers is mainly realised during the service encounter. Some service scholars have adopted this interactive nature in their definitions, e.g., Lovelock (2001) defines services “as an act or performance offered by one party to another (...)”. Grönroos (2000) also stresses interaction between customers and service providers. Moreover, Liljander and Strandvik (1995) pinpoint that some services can be called relational, comprising the interactive nature of services.

Traditionally personal interaction is considered an essential part of all services, but nowadays in many technology-based services personal

interaction is restricted or eliminated (Bitner et al., 2000), and customers are transacting mainly or only with machines. Consequently, we raise a question: Does interaction always require a human response, or can it be totally replaced by an automated reply? Even if there is no ultimate answer, a service may become effective and still retain its relational nature, if the automated service functions interactively. A great challenge lies in the continuum between highly personal interaction and highly automated interaction. Yet, personal interaction is vital in after marketing in, for example, performing service recovery or solving technical problems (Lovelock, Wirtz & Keh, 2002).

For a long time technology has played an increasingly strong role in service research (e.g., Bitner, Brown & Meuter, 2000; Dabholkar, 2000). Technology is emphasized at the expense of interaction. It may be a trend that human interaction is diminishing from some services, although personal service in many cases remains important. Heinonen (2004) has defined a technology-based service 'as a service with both tangible and intangible elements that is performed totally or partly by the customer via a technology interface.' This leads us to consider whether the term 'automated interaction' should even be used when technical devices are communicating with each other without human contact (Järvinen & Lehtinen, 2005). The other alternative is that there is a machine at the other end and a human being at the other. This option we call 'semi-automated interaction'.

In addition to the service characteristics discussed above, among the others often referred to are heterogeneity, ownership and perishability (see e.g., Zeithaml & Bitner, 1996). We will explain very shortly why these characteristics are excluded from our article. First, many goods are also heterogeneous. On the other hand, heterogeneity tends to vanish from services along with technology and they become highly standardized. Even differentiated services often consist of standardized elements (Lehtinen & Järvinen, 1996; Vuorinen, Järvinen & Lehtinen, 1998; Järvinen, Lehtinen & Vuorinen, 2003; Lovelock & Gummesson, 2004). Second, the studies by Järvinen (1998) and

Ylikoski and Järvinen (2011) indicate that ownership is transferred in many services, but there are still many services that do not employ the issue of ownership. Third, perishability is destroyed at least from information-based services because they often allow recording, replay and reuse (cf. Lovelock & Gummesson, 2004).

3. Service Innovation Definition and Characteristics

In order to connect service characteristics to service innovations, the latter concept has to be discussed. According to Menor, Tatikonda and Sampson (2002), the two constructs 'service development' and 'service innovation' have been used interchangeably in earlier research. However, service innovation is often seen as a more extensive construct than service development. Service innovation and service development can be distinguished in a way that the former describes the strategic issues of offering new services and the latter describes the tactical management of development activities (Menor et al., 2002). This may be the right direction in trying to understand the phenomenon, but we are not convinced that the division is reasonable. The line between strategic issues and tactical issues is often unclear and dependent on the situation.

In service marketing and management literature, the theoretical alternatives to study service innovations can be grouped as follows: 1) new service development (NSD) (e.g., Cowell, 1988; Johne, 1993; Edvardsson, Haglund & Mattson, 1995; Edvardsson & Olsson, 1996; Olsen & Sallis, 2006; Smith & Fischbacher, 2005), 2) service design (e.g. Shostack, 1977; 1982; 1984; Ballantyne, Christopher & Payne, 1995), 3) service re-engineering (e.g., Drew, 1994; Curry, 1999), and 4) development of innovation processes (e.g., Johne & Harborne, 1985; Morgan, Cronin & Severn, 1995; Cooper & Kleinschmidt, 1994; Berry, Shankar, Parish, Cadwallander & Dotzel, 2006; Rizova, 2006). The groups are partly intertwined with each other.

Innovation is not a very new term in academic

business literature. Sundbo (2001), referring to Schumpeter (1934), defines innovation as ‘the introduction of new elements or a new combination of elements in the production or delivery of manufactured and service products.’ Newness seems to be the central characteristic of innovation in this definition. Innovation can be defined either narrowly as confined to the idea generation phase (Edvardsson, Gustavsson, Johnson & Sanden, 2000), or broadly, incorporating the whole process of service development (e.g., Sundbo, 1998; 2001). Today, many business managers in particular emphasise marketing, saleability and other business abilities in the innovation context. They consider that innovation is realised only if it can be commercialised.

Hill and Jones (1998) define innovation as ‘the process by which organisations use their skills to develop new goods and services or to develop new production and operating systems so that they can better respond to the needs of their customers.’ In this definition, the main characteristics of service innovation are skills that organisations use in developing new services and/or new production and operating systems, and to better respond to the needs of customers. However, as far as services are concerned, this fairly pertinent definition may be criticised for disregarding service characteristics. It also differentiates services and their production and operating systems rather vaguely.

The innovation process can be multidimensional where various stages overlap with each other (Pohjola & Mittilä, 2006). Nevertheless, the result of innovation work, e.g., a new service, is often referred to as an innovation. It is our opinion that the innovation process itself and its result, i.e. a service innovation, should be differentiated from each other. The reason lies behind the service characteristics. Namely, the result of an innovation process is a new innovative service, which on its part manifests a processual nature.

After linking our previous discussion on service innovation and characteristics, the definition of service innovation emphasising both service and innovation characteristics and their processual nature can be formulated as follows:

Service innovation is by large an intangible and benefit-providing new object of an exchange process that includes to some extent inseparable production, marketing, consumption and other service processes, and is better targeted to produce value for customers and service-providing organisations, and developed by using the skills and knowledge of service providers and customers in simultaneous interaction.

Thus, service innovation is a new service with the basic service and innovation characteristics. Now the main service characteristics are included in our definition. Basically, innovation is a benefit-providing object of exchange when speaking about service-like entities. Inclusion of ‘benefit-providing’ and ‘to produce value for customers and the service-providing organisations’ is also important.

The processual nature is significant in any service innovation. Every service process should be studied carefully as a part of any innovation, because it may be influenced by different service characteristics in unique ways, compared to other processes. We have not included operating systems in the definition, though we consider that an improved operating system is often linked to innovation. Customers cannot, however, see operating systems comprehensively because they are, to a varied extent, a backstage function, and thus invisible to the customers. Like Atuahene-Gima (2005), we consider in our definition that personnel skills and knowledge are of utmost importance in creating a new service innovation. She even proposes that both competence exploitation and competence exploration are usually required.

Our definition of service innovation is based on the service definition presented earlier which is quite wide. Consequently, our definition of service innovation can be considered a relatively wide and open definition, though there are some additional limitations in our definition of service innovation. For example, the number of characteristics and their level of importance can vary. Many characteristics can be dependent on each other in

such a way that a change in one characteristic may lead to changes in another characteristic.

A service innovation can be a novel service encounter and/or a novel outcome of the encounter. Lovelock et al. (2002) have identified seven categories for the development of new services. Only the first two categories include clear innovations, whereas all the other categories conversely contain only some innovative elements. The first category deals with major service innovations that are new core services for markets, and the second category consists of major process innovations. Lovelock et al. emphasise that all service improvements are valuable, but in addition to this, we believe that service providers earn best by proper innovations, i.e. services that clearly offer new value and may also be targeted at new customer segments. We agree with Vargo and Lusch (2004a) when they argue that success comes from finding ways to provide efficient, standardised solutions that are easier for customers to use.

Notwithstanding, Lovelock et al. (2002) warn not to rush into adopting new innovations without thinking through the implications for customers, employees and the overall operating system, because otherwise it may end up in pain. Careful consideration of the nature and characteristics of each service innovation is required. It is important to understand that there is no one and only best way with regard to innovation strategy (Hine & Ryan, 1999). However, innovation per se does not benefit the company unless it manifests value in the customer-driven marketplace (Kaudampully, 2002). It is fair to admit, that customers choose how they use services: either automated or personal interaction or something between the two. However, to successfully use of automated services, customers are obliged to have sufficient physical and mental skills and/or appliances to make it possible (Vargo & Lusch, 2004a).

Many new services fail because they simply have no market (Ogawa & Piller, 2006). Especially technology-based service innovations may be problematic, as customers cannot experience them before their launching and there often is no 'market pull', i.e. latent need in the market (cf.

Herstatt & Lettl, 2004). Repo et al. (2006) argue that totally new services are unlikely to become saleable until customers find out what real value they can bring or what needs they can fulfil (see also Zolfagharian & Paswan, 2009). In order to ensure saleability, the mission of any service provider should aim at adding value by solving customers' problems, and in this the participation of the customers is essential. Anyway, saleability is a problematic issue because it leads to e.g. the following questions: To what extent should a service be saleable? How profitably should it be saleable? For these reasons, we did not include saleability as such in the definition, but it is implicitly included in marketing and customer values. Respectively, many scholars suggest integrating customers strictly to the innovation processes (Franke, von Hippel & Schreier, 2006; Ogawa & Piller, 2006; von Hippel & von Krogh, 2006), because it creates a positive attitude towards innovation from the customers' part.

All in all, in targeting innovative outcome, service characteristics represent natural points of departure and concurrently they should be a focus of the work during the innovation process. Thus, we have returned to the basic reasoning of our study.

4. Empirical Case Examples of Service Innovations

4.1 Description of Four Case Examples

In this chapter, four empirical case examples describing service innovations are discussed. These real life examples serve as an exploratory examination of how these characteristics are linked with service innovations. Two of the examples are innovations born from technological development, and two of them are e-services. Both types of innovations represent the areas where most service innovations will be focused in the future. In fact, we preferred to examine empirically the modern service innovations on the basis of our general definition. All the four service innovations were instigated by technology push, which Hers-

tatt and Lettl (2004, p. 156) describe ‘as situation where an emerging technology or a new service combination of existing technologies provides the driving force for an innovative product or problem solution in the market place.’ Three of the four examples represent consumer services and one of them, the e-risk management toolkit, is targeted at SMEs, providing an example of b-to-b services.

The empirical study was carried out in following sequential phases (see e.g. Gummesson 1999): First the researchers interviewed a number of experts in the various service sectors and encouraged them to suggest examples of the recent service innovations. Thereafter, the service contents of the suggested services were studied carefully, and four examples were selected. The next step was to interview representatives of the service providers and write case descriptions. In this connection the categories of service innovations as listed by Lovelock et al. (2002) were identified. Finally the researchers analysed the case examples according to the service characteristics.

Case example 1: Household budgeting

Household budgeting introduced by a fairly large Scandinavian bank is based on an ICT-system that produces a yellow household budget book. It is formulated according to the layout of the Finnish state budget. In fact, household budgeting represents a new service concept for managing service encounters. Customers are encouraged to book a one-hour appointment with a bank teller and during the encounter their incomes, outcomes, as well as current assets and liabilities, i.e. financial investments and loans, are entered into the ICT system. As a result, the ICT system assists the teller in advising how to limit costs, invest extra money and finance household investments through various types of loans. At the end of the meeting, customers obtain their own yellow books with real-life figures on their household finances.

Household budgeting is a completely new type of service concept that has been successfully launched in the market. The service is free of

charge, aimed at attracting new potential customers. The main advance of this innovation is that it serves to improve the management of financial assets and liabilities. Through household budgeting, the bank aims to sell additional banking services to households, such as various financial instruments, credit cards, short term loans etc. At the same time, the bank is able to control customers’ budgets, by e.g. anticipating their financial problems.

Household budgeting is a technology-based innovation consisting of a standardised concept that is utilised during service encounters in personal interaction between a teller and a private customer. The teller uses the ICT system, the customer provides the data to the system and as a result the household budgeting system suggests how to handle the customer’s financial affairs.

Case example 2: Private investment combining stocks and derivatives

Some international banks have developed a package that combines stocks and derivatives for their private customers. The basic idea is to increase profits and secure investment capital by means of derivatives when stock markets produce low profits under uncertain market conditions. The combinations vary according to time horizons from short-term to long-term investments. They can be restricted to certain areas of financial markets. Even the number of stocks and derivatives can vary according to customer preferences. ICT assists in managing the selected portfolio of stocks and derivatives by following the chosen allocation and other terms. There is a set of alternatives of packaged stocks and derivatives available as self-service on the Internet. The service package can even be tailored to the needs of the customers, but in that case the customer has to negotiate with a representative of the bank either face-to-face or on the phone.

The innovation in this service lies in combining two existing but separate services together into one core service. It is a technology-based service,

because ICT development has made it possible to bundle an unlimited number of various kinds of financial investment packages.

Case example 3: e-risk management toolkit for SMEs

The e-risk management toolkit for SMEs interested in risk management provides easy-to-read information and practical assistance on how to identify and handle various risks. Different elements of risk management are grouped into small sections that can be handled with a reasonable amount of work. The toolkit covers a wide selection of risks, such as business risks, environmental risks, product risks, personnel risks, occupational safety and health risks, travel and traffic risks, etc. This enables the risk management process to be set in motion with little time and effort, and results can be achieved without delay. The e-risk management toolkit includes also instruction and work booklets, work cards, info cards, vulnerability analysis, and a trainer's guide that can be loaded from the system.

The toolkit functions as a self-service only and it is free of charge. There is no personal assistance available. The only exceptions were the training courses organised after the launching of the service in electronic environment. A free community called SME Risk Management Forum maintains the toolkit and its work is based on voluntariness. The development of the toolkit was financed by public allowances.

The innovative aspect of this service is that an existing toolkit was moved to the Internet, but it was adapted it in a way that it became easy to use as a self-service. Thus, the logic of the toolkit was changed in order to suit the electronic environment and guide users in how to proceed with their risk management issues.

Case example 4: Properties for sale e-portal

The e-portal containing properties for sale is designed for private customers searching for a new

home. It contains information, photographs and maps of properties for sale. Real estate agents carry the costs of the portal, while for home seekers it is free of charge. The portal has been redesigned several times in order to help the home hunters to find their dream homes more easily by matching their wishes with the alternatives on offer.

The redesign of the portal provided more new profiling variables. The original variables included location, type of property, number of bedrooms, size in square meters and price. Now the profiling can be zoomed by several optional variables, such as year of construction, sauna, elevator and quality level. If a home turns up that matches the requirements, a request of personal contact may be left for the real estate agent involved in selling the property. If the e-portal does not find suitable alternatives, one may use a so-called 'watch service', which will deliver an automated e-mail as soon as a suitable home appears on sale.

Even though the portal itself functions as a self-service, it aims to get home hunters and real estate agents into personal interaction with each other. It is very rare that a property is bought without a visit to the premises, and for this reason, the parties will usually continue negotiations face-to-face outside the e-portal.

This case example represents an existing e-service that was improved by additional novel and innovative elements offering more benefits for home hunters. Earlier, with a more limited number of variables, the home hunters had to go manually through the properties for sale and try to find the important information of their future home on they own. If the information was not presented, they had to contact the real estate agent and ask for more.

To summarise the case examples it can be stated that household budgeting is a new concept targeted towards selling something extra to existing and potential customers. Stocks & derivatives represents a new packaged mode of combining two existing core services, the e-risk management toolkit transfers existing business into the internet environment in a new way, and the property e-portal represents improvement of an existing

e-service. As a result, the innovation processes and their results are different from each other in each case example, as may also be the case with their service characteristics.

4.2 Interpretations of Case Examples

In analysing the empirical cases interpretative analysis with comparative methodology was used (see e.g. Tilly, 1984; Silverman, 2000; Calvert, 2002). In comparative methodology the context usually serves as a main source when the elements of comparison are determined. In this study, the service characteristics included in our service innovation definition represent crucial elements in the service innovation process. Therefore, they are considered relevant dimensions in comparing and analysing the empirical cases.

The characteristics of our definition are materialised with the aid of the case examples and the results are summarized in Table 1. In the table, 'X' indicates that the studied service clearly has the particular characteristic concerned. The mark '(X)' in turn shows that the service at least partly or conditionally has that feature. The mark '-' indicates non-existence of the characteristic in our study. In principal, each of the characteristics is a continuum. Both ends of the continuum are actually extremes where no individual service can normally exist. Therefore, our three levels, 'X', '(X)', '-', of each characteristic are also relative.

The results summarized in Table 1 show that none of the four case examples completely employ all the studied characteristics. The reasons for this fairly surprising result of the analysis will be next considered by examining each characteristic separately.

Intangibility has partly disappeared from household budgeting along with the concrete yellow

budget book given to customers after the service encounter. The e-risk management toolkit materializes in various leaflets and cards available for printing. For example, vulnerability and other risk management analysis materialise when electronic forms are implemented and the concrete risk management instructions are received as a result of the conducted analysis. The property e-portal includes information, photos and maps that can be saved and printed for future purposes. All these functions make the services more tangible. Only stocks & derivatives remain in an intangible form.

Three of our case examples are *processual in their nature*. The household budgeting follows always the pre-stated process programmed in the ICT system and the teller is not able to change the process. The e-risk management toolkit is a completely standardised package even though the users can choose the modules and their order. As soon as a module is chosen, the system suggests how to proceed in the process. The property e-portal is also programmed to follow the standardised process. Only stocks & derivatives do not always contain previously stated procedures that customers must follow. Instead, a standard package on the Internet is ready for investors any time. Therefore, the process nature of production is in this case diminished strongly. On the other hand, the tailoring of stocks & derivatives returns processuality where both customer and service provider are involved.

Inseparability of production, marketing and consumption applies only one of the cases, household budgeting, which is started and finished during the service encounter. The stocks & derivatives service can be held for several years, and the consumption continues during the whole period, but the service itself is produced either before

TABLE 1: Examined characteristics of service innovations

SERVICE INNOVATION	INTANGIBILITY	PROCESS NATURE	INSEPARABILITY	PERSONAL INTERACTION
Household Budgeting	(X)	X	X	X
Stocks & Derivatives	X	(X)	(X)	X
e-Risk Management Toolkit	(X)	X	-	-
Property for Sale e-Portal	(X)	X	-	-

customers even decide to invest in it or it may be tailored during the encounter, i.e., at the moment the investment is made. Because of the option of tailoring stocks and derivatives, inseparability may partly materialise. The e-risk management toolkit can also be 'consumed' for a long time, and the property e-portal's 'watch service' and contact requests divide the consumption and production into several mostly separate intervals.

Personal face-to-face *interaction* is included in two of the services, household budgeting and stocks & derivatives. Household budgeting is developed especially for personal interaction and stocks & derivatives involves such a complicated combination of financial instruments that professionals are usually needed to explain them to the customers, even though the most capable customers can use them as a self-service on the internet. Conversely, in the cases of the e-risk management toolkit and the property e-portal, the customers are forced to deal with machines and do everything from the beginning to the end as an automated service. The e-risk management toolkit service does not employ any personnel, so personal service is completely out of the question. In the case of the property e-portal, personal service is, however, available later on, but then it is considered a different service. In fact, if a suitable home is found, home hunters are able to request personal contact, but there is no personal service available otherwise. In the experience of our study, the requests do not always lead to any contact from a real estate agent.

The case examples show that the level of manifestation of service characteristics varies between each service innovation. When the innovation process is started, the variation should be taken into account. It should be one of the main goals of the innovation process to change the characteristics in a more effective direction. When creating innovations in areas like household budgeting and stocks and derivatives, all the four characteristics should be taken into account. The characteristics under (X) might be taken into account at a lower level.

When creating innovative e-services, process nature seems to be the most relevant characteristic

from the viewpoint of innovation work. Instead, intangibility and inseparability seem to materialise less with these services than in the context of traditional services. The non-existence of personal interaction in e-services is rather interesting, because interaction is assumed to be an essential part of every service transaction.

The main conclusion of the analysis presented above is that the chosen service characteristics do not fit in completely with our empirical cases. Personal interaction - traditionally considered to essentially describe the nature of services - settles down at the zero level or close to it when electronic devices are utilised in the production of new e-services. It can be even questioned whether e-services have lost so many of the essential characteristics that they are no longer typical services. However, the two technology-based service innovations (household budgeting and stocks & derivatives) have not lost the element of interaction, even though it has been suggested by various authors (see e.g., Bitner et al., 2000).

5. Discussion and Conclusions

The main objective of this article was to introduce a new definition of a service innovation that in addition to innovation characteristics, takes the most typical service characteristics explicitly into account. We consider that our definition of service innovation is quite general and comprehensive enough to function as a basis for the discussion on service innovations. Naturally, our definition is, however, only one optional definition of service innovation. With this article we also contribute by proposing that service characteristics are crucial and natural starting points and they belong to all service innovation processes whether all the characteristics or their importance change during the innovation process or not. For this reason, we strongly suggest that service characteristics should be included in any definition of service innovation.

The empirical objective was to examine and interpret two empirical case examples of technology-based service innovations, and two empirical

case examples of e-service innovations. The empirical case examples seem to support the manifestation of our selection of service characteristics, especially intangibility and process nature. The most dramatic change seems to concern personal interaction which diminishes close to zero in connection to e-services, but exists in technology-based services. The result does not support the idea of improved effectiveness earned by the aid of service automation, which has been a popular issue in the recent years. Indeed, it is generally assumed that along with service automation, part of the staff can be moved to other operations, but our results show that human contacts will be maintained in spite of increasing utilisation of new technology. Therefore, we wonder if the most demanding and most information intensive services were suitable for total automation at all.

However, the main lesson we learned on the basis of our empirical case examples is that each service innovation is unique. Probably, we may also find more differences if we study more service innovations. In this respect, it is very important that the change of characteristics and their levels may become a significant issue in marketing research and practice because of the continuous shift towards ICT-based services. Consequently, our conclusions may be more significant in the future. In addition, many characteristics have different importance and manifestation depending on the innovation process, innovators, customers, markets and the innovative service itself. Thus, the characteristics are and will continue to be the essential basis in service innovation.

At the beginning of this article, we referred to the critique towards the traditional view of service characteristics presented by Vargo and Lusch (2004a; 2004b) and Lovelock and Gummesson (2004). These authors have also pointed out the lack of empirical research on various service characteristics. We are convinced that for the development of service innovation research, more empirical as well as theoretical studies are required from the following angles:

- *Basic characteristics of services:* Service environments and service contents are changing,

but will the main service characteristics or their importance and levels remain?

- *Deviations between various services:* Do some characteristics fit some services better than the other? In this we refer to Lovelock and Gummesson (2004) when they pay attention to ownership/non-ownership as one characteristic that differentiates services from each other. Also, the results of the analysis of our empirical case examples support this viewpoint.
- *Characteristics of innovation:* Even though this article concentrates mainly on elaborating the role of service characteristics in service innovations, we have no reason to underestimate the role of innovation characteristics in future research.
- *Managerial implications of service characteristics:* When a service itself, its marketing, delivery or production processes are changed, will it lead to a major change in the importance of the different service characteristics? To what extent and when are the characteristics utilised in service innovations?
- *Data:* Our fairly explorative data may be sufficient for this kind of mainly conceptual and explorative article. However, more empirical and representative case examples or other type of data are required to prove more trustworthy the changing nature of service characteristics.

To be honest, it should be asked if some service innovations have already gone too far in the standardisation and automation of services. This is an especially relevant issue when taking into account that there are different market segments. Customers' attitudes and competencies cannot ever be equal in all markets, instead, they tend to be moving in a more fragmented direction.

Another important issue in the context of services is the human need for personal interaction. There are individuals in all the age segments who prefer to rely on personal services instead of automated services. This represents a challenge both to service innovation research and practice. We anticipate that in the future more and more services

will be electronised and automated, but some will return to face-to-face interaction (see Järvinen et al., 2003). This means that also from now on, services can be placed in a continuum, where totally automated services and totally personal services are at the opposite ends or actually near the ends. However, many services between these extremes will contain an opportunity for face-to-face interaction at least in some situations.

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