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“The pessimist sees difficulty in every opportunity,
while the optimist sees opportunity in every difficulty.”

(Winston Churchill)

ABSTRACT

Services representativeness in the world economy, in terms of global output, employment and trade, has been growing, due to globalization, economy's deregulation, and fierce competition. This tendency of trading services changed the traditional economic scenario. It opened up markets that until that moment were closed, which enabled the appearance of new internal and external actors, and forced firms to start focusing on differentiation, flexibility and cost awareness. To remain competitive in the market, firms had to innovate their products, offering new or supplementary services, which over time, represent a significant part of firm's sales. Moreover, the current world crisis scenario combined with saturation of domestic markets, encouraged firms to expand its businesses to other countries. Thus, the purpose of this study is to conduct a literature review, investigating how firms develop new services at the multinational level.

This study begins with defining what are new services and how firms develop them. Based on innovation literature, it is adopted a definition of new services. Then, through the New Service Development (NSD) process literature, it is suggested that firms should establish a systematic NSD process, encompassing distinct stages, interactive and non-sequential. At the multinational level, it is recognized that distinct countries differ in terms of innovation, strategies, processes and managers attitudes. However, the literature review did not allow finding a systematic process to be adopted in the development of new services, simultaneously, in more than one country, neither in terms of process standardization, nor in terms of process design. Finally, it is explored the field of service design, where it is presented the concepts of service architecture and service modularity. It is also proposed a framework to support future investigation regarding service architecture.

Keywords: service innovation, NSD, multinational, architecture, modularity

RESUMO

A representatividade dos Serviços na economia mundial, ao nível da produção, emprego e comércio mundiais, tem aumentado, devido à desregulamentação da economia, globalização e forte concorrência. Esta tendência de comercializar serviços alterou o cenário económico tradicional. Abriu mercados que estavam até então fechados, permitindo o aparecimento de novos atores internos e externos e levando as empresas a focarem-se na flexibilidade, diferenciação e consciencialização de custos. Para se manterem competitivas no mercado, as empresas tiveram que inovar os seus produtos, oferecendo serviços novos ou complementares que, ao longo do tempo, representam uma parte significativa das vendas da empresa. Além disso, a combinação do atual cenário de crise mundial com a saturação dos mercados internos, incentivou as empresas a expandirem os seus negócios para outros países. Assim, o objetivo deste estudo é realizar uma revisão da literatura, investigando como as empresas desenvolvem novos serviços a nível multinacional.

Neste estudo, começa-se por definir o que são novos serviços e como as empresas os desenvolvem. Com base na literatura de inovação, adota-se uma definição de novos serviços. Depois, através da literatura do processo de desenvolvimento de novos serviços, sugere-se que as empresas devem estabelecer um processo sistemático, com várias fases, interativo e não-sequencial. A nível multinacional, reconhece-se que diferentes países diferem em termos de inovação, estratégias, processos e atitudes dos gestores. Contudo, a revisão da literatura não permitiu encontrar a sistematização de um processo que possa ser adotado no desenvolvimento de novos serviços em mais do que um país em simultâneo, nem em termos de normalização do processo, nem em termos do desenho do processo. Por fim, é explorada a área do design de serviços, sendo apresentados os conceitos de arquitetura e modularidade de serviços. Propõe-se, ainda, um quadro para auxiliar a investigação futura sobre arquitetura de serviços.

Palavras-chave: inovação de serviços, desenvolvimento de novos serviços, multinacional, arquitetura, modularidade

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CHAPTER 1 – INTRODUCTION

Today's economy is dominated by services. According to the World Trade Organization, "services represent the fastest growing sector of the global economy and account for two thirds of global output, one third of global employment and nearly 20% of global trade" (World Trade Organization, 2012). Particularly, in Portugal almost 40% of active population works in the services' sector (Banco de Portugal, 2012).

This tendency of trading services changed the traditional economic scenario. It emerged as a consequence of the communications revolution combined with globalization, economy's deregulation, fierce competition, lifestyle's changes and life expectancy raise. Increasing deregulation opened up markets that until that moment were closed (such as, telecommunications, banking, and insurance), and enabled the appearance of new internal and external actors. Firms started focusing on differentiation, flexibility and cost awareness, and to remain competitive in the market, they were forced to innovate their products, offering new or supplementary services, which over time, represent a significant part of firm's sales (Dantas & Moreira, 2011), even in traditional manufacture-oriented sectors, such as textiles and automobile.

We investigate both product and service literature, trying to understand what distinguishes products and services. It became relevant given the fact that currently, what customers purchase includes both tangible and intangible elements. For instance, taking into consideration the activity of Zara, one of the world's biggest fast-fashion retailers, we might say that it sells clothes; but going deeper we realize that what customers buy go beyond the fabrics. Today, Zara's customers are looking for availability, low cost and high fashion products; in response, Zara developed new services, following the advent of the Internet. Zara launched an on-line store, an iPhone/iPad application and a facebook account. These communicating services, among other things, enable customers to see "on time" which merchandise is available in each store around the world, its prices and future arrivals. Customers can also buy clothes and accessories online; look at photos of the catalogue, the lookbook and the entire collection; see suggestions of how to use certain products; and stay updated about all the

news and events promoted by Zara. In other words, what is really being sold is an experience, which includes selling products (clothes), ideas, and feelings; and at the same time, Zara is developing relationships with its customers.

We assume that the main root of services theories rely in the field of products, this is, services theories are originated primarily in the field of goods and then they are transferred to the services context. Nevertheless, some service subjects, as service innovation and new service development (NSD), achieved some kind of independence due to services characteristics of intangibility, heterogeneity, simultaneity, perishability, inseparability, role of people and the nature of services as both product and process. Service firms should consider the specific situation or problem they are dealing with, and figure out first, if there is any similar situation in the product field in which they can get insights that could lead them to an answer and transfer it to the service context; if not, they should start over and find an original solution from the service field. In the first case, firms avoid costs and time of research; in the second case they gain focus and (service) context clarity, as well as, they enable creativity, better understanding and exploitation of opportunities for future service researches.

In this global service-dominated economy, firms have to continuously innovate, whilst identifying future customers' needs. As in the case of Zara, firms feel the requirement of being one step forward from their competition and from what customers feel they need. As Steve Jobs, co-founder of Apple, once said "you can't just ask customers what they want and then try to give that to them. By the time you get it built, they'll want something new" (Inc. Magazine, 2012). Therefore, it is important to comprehend how firms develop new services: Do they use traditional tools of developing new products, or in turn, define new tools from the field of services? Do service firms assume that new services "just happen", rather than through a systematic development process, or in contrary, design an appropriate NSD process?

To answer these questions, we firstly, define "new service"; and then, investigate how new services are developed. We start exploring the NSD literature, looking for a definition of new service. Then, to a better understanding

we seek for further information in the field of innovation, as we assume that somehow innovation plays an important role in a firm's NSD activity.

Furthermore, the actual economic crisis scenario has reached economies around the world and along with saturation in domestic markets, it encouraged firms to go outside its boundaries, and look for growth opportunities overseas. When pursuing this goal, firms have to review its strategy considering additional variables related to the destination country, such as its socio-economic and cultural characteristics. For instance, when Zara decided to enter in the Middle East market, managers had to keep in mind that in some countries women cannot use some kind of clothes (e.g. mini-skirts). Moreover, when developing new products or services for multiple countries, simultaneously, Zara takes into account which countries? Does Zara develop for all countries the same product or in the same way? Thus, we question: how firms develop new services at the multinational level?

It is relevant to investigate whether firms change its NSD process when they are presented in two or more countries, at the same time, and desire to develop a new service in those countries, simultaneously. Thus, we wonder whether firms change the NSD process used at home and if they change it, how do they do it? In other words, do they adapt their stages and processes to local characteristics or do they standardize one unique process? Do they standardize the entire process or only some parts of it? Also, do they develop all stages in each country or, for instance, they establish the idea generation in country A and test it in country B? Or even, does a firm identify customers' needs and expectations in one country and test the service in another? To find the answers, we investigate the field of NSD, which is presented in chapter 2.

We are conscientious that it may be hard to get a clear perception of how firms develop new services at the multinational level, and it can be even harder to get a generalized understanding of it. As the service design is the outcome of the NSD, and firms are becoming to recognize its importance, we explore the field of service design searching for a better understanding of NSD process, particularly, we aim to clarify the concept of standardization. Also, when firms define the development of new services they have to design them accordingly,

as well. There is a new trend of designing services involving the concepts of architecture, modularity and platforms. We wonder if its assumptions may help firms developing new services overseas. But, what exactly are those concepts? How can they be beneficial? Moreover, at the multinational level, how do firms define which modules and platforms and at what level? When, where and who should finalize and customize the service offer? We review this literature on chapter 3, trying to synthesize the main elements that might help us answer our research question.

The sources of our research are internet databases (e.g. Emerald); conference proceedings (e.g. QUIS12 and EurOMA); and specialized books. We select about 180 papers, mostly written by two or more investigators each; and focusing diverse subjects, such as, Servitization, Modularity, NSD, Innovation, Internationalization and Sustainability. Despite being a recent field of research we considered several researchers addressing those themes from distinct perspectives.

This study is organized as follows: in chapter 2, we investigate how firms develop new services at the multinational level. We start exploring the NSD literature searching for a definition of new services, and then to a better comprehension we seek for further information in the field of innovation. Next, we search the literature on NSD process, to find out how new services are developed; and then, we apply it to the multinational context.

In chapter 3, we explore the field of service design, introducing the concepts of service architecture and service modularity. Then, we search for insights that enable us advance some hypotheses with regard to NSD at the multinational level.

Finally, in chapter 4, we present the conclusions of our study and its implications. We also identify limitations of our study and make suggestions for further research.

CHAPTER 2 – NEW SERVICE DEVELOPMENT

In this chapter, we explore the question “How firms develop new services at the multinational level?” We argue that it is important to firstly define what we intend as being “new services”, and then we are able to analyze how new services are developed. Thus, to get an accurate answer, we divided our main question into three fractional questions: (1) What are new services? (2) How do firms develop new services? And (3) How do firms develop new services at the multinational level?

To answer the first partial question, we reviewed the literature on NSD, looking for a definition of “new services”. We found the roots of NSD theories and concepts, and respective evolution through time and distinct economic contexts; we also identified either the major NSD success factors that can influence new services’ performance, or distinct processes of NSD. However, we did not find a definition of “new services”. So, we addressed the literature on innovation for a better understanding of new services. To answer both second and third partial questions, we reviewed the literature on NSD, focusing in the field of NSD process, where we wanted to know whether firms develop a formal systematic process, and which are the stages of that process.

Therefore, this chapter is structured as follows: in section 2.1., we investigate what are new services, based on the literature of NSD and innovation. In section 2.2., we explore the literature on NSD process, to find out how new services are developed. Finally, in section 2.3., we continue in the field of NSD process but we expand it to the multinational context.

2.1. New services and innovation

In this section, we answer our first partial question “What are new services?” We start investigating the NSD literature, and we identify the roots and evolution of NSD theories and concepts, as well as, the NSD success factors. Then, to fill the gap on the NSD literature regarding the definition of “new services”, we

enter the field of innovation. We describe innovation, recognizing its main objects of analysis through its evolution; and then, we focus on service innovation. Next, while building a definition of “new services”, we introduce different definitions and classifications of types of new services; and we also highlight the importance of understanding those types of new services. There are different frameworks of innovations, and it is hard to apply all of them in different industries and firms. We choose to focus our analysis in the continuum of the nature of innovation (Johnson, Menor, Roth, & Chase, 2000), ranging from radical to incremental; because it revealed to be one of the most consensual and cited approach among different researchers.

Actually, it is hard to distinct firms as being pure manufacturers or service providers, because both deliver an offering that results from a combination of tangible and intangible elements, in order to remain competitive in the market. Currently, customers demand a certain level of personal need’s satisfaction and guarantees from firms which begins in production stage and extends to the final delivery. This imposed new requirements to firms, such as continuously investment in innovation and in planning the development of new products and services. Thereby, we agree with the literature that contends that firms should start looking at the NSD as a tool to maximize its strategy; it could represent an important investment with great returns. Indeed, in spite of the risk involved in developing new services, when NSD is correctly defined and implemented there are a group of factors under manager’s control (e.g. the nature of the service or the NSD process) which can support both the success and performance of the new services, and also provide great returns.

The roots of NSD researches are based on the studies, frameworks and findings of New Product Development (NPD) (Stevens & Dimitriadis, 2005). The investigation on NPD has highly contributed to a better understanding of the overall innovation process, and in its essence there is an assumption of similarity between the development process for both tangible products and services (Alam, 2006).

However, it is argued that services are different from products (Stevens & Dimitriadis, 2005; Alam 2006, 2007) due to its distinctive characteristics of

inseparability, intangibility, perishability, heterogeneity, simultaneously production and consumption, and co-production (Alam 2006, 2007, 2011; Menor, Tatikonda & Sampson, 2002; Stevens & Dimitriadis, 2005). These differences challenge the generalization of tangible product theories across services sectors (Alam 2006, 2007, 2011; Stevens & Dimitriadis, 2005), and enable the distinction of NSD process from the NPD process (Menor et al., 2002).

Menor et al. (2002) argue that despite this trend of separately analyzing the fields of products and services, it is important to investigate whether the NSD process is really distinct from the NPD process. The degree of this contrast would indicate not only how further NPD research could be explored, but it would also identify which elements are indeed different and so should be explored in upcoming NSD research. They conclude that service researchers should pay higher attention to subjects, such as, integration/coordination of "front" and "back" office ends of the process; understanding of external and internal newness of the service to assure a better assessment of risk and resource requirements; specification of service architectures, necessity of tools to enable quick implementation and replication of the service process and coordination/integration of the development of front and back-offices. These issues and concepts are further analyzed in this study.

The NSD research has been focusing on the NSD success factors, among others reasons, because NSD is risky and has an associated failure rate of almost fifty percent (Alam, 2006). For instance, both Johnson et al. (2000) and Alam (2011) identify a set of success factors, alike those proposed by NPD studies, which can be used in services to increase the probability of NSD success.

Specifically, Menor et al. (2000) present a categorization of success factors which includes: the nature of service; the product-market characteristics; the project synergy; the NSD process; and the service innovation culture. Alam (2011) highlights the process of NSD and the types of new services developed by a firm as key determinants of a new service's performance. Thus, both agree in the importance of developing a NSD process. Also, understanding new

service types is determinant, because it helps a firm to define its strategic vision, comprehend what its offering should be, and even to plan how to obtain the suitable resources for particular NSD projects (Alam, 2011). The NSD process and firm's new service strategy "are typically under the manager's control and therefore are the key issues in NSD" (Alam, 2006: 237). Despite these significant insights for academics, on the side of practitioners a little has been proved to be useful. Indeed, these factors intend to explain *what* should be done, instead of *how* it should be done (Johnson et al., 2000).

Overall, concepts and theories regarding the NSD resulted from the literature on NPD, and recently it achieved some independence as researchers started to notice some specific characteristics and contexts of services, which differ from products. However, this is a recent stream of research and we found a gap in the service literature regarding, not only the definition of "new services", but also the generalization of formal processes and strategies to develop new services. We found diverse NSD models proposed in the literature, but it was not clear the existence of one that could be standardized and applicable across different industries. There are frameworks for both innovation and NSD, but there is no consensus on its definition, interpretation, applicability and results (Menor et al., 2002). Recent investigation appears to be in line with this argumentation.

So far, we tried to answer our first partial question "What are new services?" reviewing the literature on NSD. As we did not find an accurate answer, we decide to explore the literature on innovation, due to its proximity to the field of NSD.

Indeed, the concepts of "service development" and "service innovation" have been used interchangeably in the literature (Menor et al., 2002). However, Menor et al. (2002) distinguish them as the former emerges from the service management and marketing focus on service quality and provides an understanding of service development practice; while service innovation is originated from the economics and business strategy focus on entrepreneurship and aims to develop abstract theories. Throughout the literature, service development is associated with describing the tactical management of

development activities while service innovation is associated with describing the strategic implications of offering new services (Menor et al., 2002).

Analyzing the evolution of innovation research, we found that its initial focus was in comprehending the constituents and importance of innovation. Then, researchers focused on the NPD process involved in the innovation and, more recently they are concerned with innovation in services (Johnson et al., 2000). Nonetheless, Alam (2011) argues that despite the growing number of service related researches, service innovation complexities are not fully understood, partly because the innovation literature focuses on tangible products and addresses services merely as a special category of those products.

Nevertheless, we agree that innovations in services enabled "the greatest level of growth and dynamism over the past several years in terms of economic activity" (Oke, 2007: 564), and it can be seen as a source of value creation, especially during difficult economic periods (Enz, 2011). Furthermore, "successful service firms innovate" (Johnson et al., 2000: 16), what remains undiscovered is both the innovation process behind the development of new services (Droege, Hildebrand, & Forcada, 2009), and the way service firms should best innovate (Johnson et al., 2000). So, our initial belief that NSD and innovation were related appears to be true, but what exactly is service innovation after all?

Service innovation can be defined as "the introduction of new or novel ideas that focus on services that provide new ways of delivering a benefit, new service concepts, or new service business models through continuous operational improvement, technology, investment in employee performance, or management of customer experience" (Enz 2011: 418). Indeed, it requires significant human involvement from both employees and customers, as they establish an interaction that will strongly influence the delivery process (Enz 2011). It is also important to note that service innovation has started as a complement to a product innovation, and now it involves several functions within the organization (Carlborg, 2011).

Also, we found that service innovation literature can be segmented into three (e.g. Coombs & Miles, 2000) or four (e.g. de Vries, 2006; Carlborg, 2011)

schools of thought – assimilation, technologist, demarcation and synthesis. The previous two schools contend that there is no need for specific service development and innovation theories and methods; on the contrary, they argue that it is possible to transfer existing frames and methods from product development into service context. On the other hand, demarcation perspective states that product and service innovation present distinctive features, and each should have its own concepts and methods. Yet, synthesis school of thought proposes an integrative perspective of innovation study, arguing that service innovation goes beyond technological factors, and became a multidimensional phenomenon (Droege et al., 2009; Carlborg, 2011). They state that each new service experience represents a new way of creating value for the customer (Carlborg, 2011). Thus, our study is in accordance with synthesis perspective.

Diverse definitions or classifications of "new services" have been proposed in the literature. We found agreement among researchers in the existence of different types of new services, even though there is no consensus on what these different types are (Menor et al., 2002). As it is shown in Table I, different authors have proposed distinct classifications of new service types and innovativeness.

Gallouj and Weinstein (1997)	Avlonitis *et al.* (2001)	Gadrey *et al.* (1995)	Oke (2007)	Chan *et al.* (1998)
Radical innovations	New to the market services	Innovations in service products	Radical innovations	Breakthrough innovations (new technologies and approaches)
Incremental innovations	New to the company services	Architectural innovations (bundling-unbundling of existing service products)	Me-too innovations	Distinctive innovations (improvements of process requiring new technologies)
Improvement innovations	New delivery processes	Modifications of service products	Incremental innovations	Incremental innovations (improvements of process not requiring new technologies)
Combinatory innovations	Service modifications	Innovations in processes and organization for existing services		
Formalization innovations	Service line extensions			
Ad hoc innovations	Service repositionings			

TABLE I – Classifications of new service types and innovativeness

Source: Alam (2011: 589)

Moreover, Johnson et al. define new services as “an offering not previously available to customers that results from the addition of offerings, radical changes in the service delivery process, or incremental improvements to existing service packages or delivery processes that customers perceive as being new” (2000: 2). Accordingly, Alam defines types of new services as “the degree of novelty or innovativeness of the new services” (2011: 589). Therefore, both authors refer to the work of Lovelock (1984, in Johnson et al., 2000) regarding the classification of new services (Table II). On the one hand, they support the existence of a continuum in the nature of innovation from radical to incremental; and on the other hand, they argue the existence of different types of new services depending on the degree of innovativeness applied. So, the NSD should be different whether it is for radical or incremental innovations (Johnson et al., 2000).

New service category	Description
Radical innovations	
Major innovation	New services for markets as yet undefined; innovations usually driven by information and computer-based technologies
Start-up business	New services in a market that is already served by existing services
New services for the market presently served	New service offerings to existing customers of an organization (although the services may be available from other companies)
Incremental innovations	
Service line extensions	Augmentations of the existing service line such as adding new menu items, new routes, and new courses
Service improvements	Changes in features of services that currently are being offered
Style changes	The most common of all "new services"; modest forms of visible changes that have an impact on customer perceptions, emotions, and attitudes, with style changes that do not change the service fundamentally, only its appearance

TABLE II – A typology of new services

Source: Johnson et al. (2000: 4)

Considering both the newness of the service offering (what service is offered) and the service concept (how the service is offered), Menor et al. define a new service as “an offering not previously available to a firm’s customers resulting from the addition of a service offering or changes in the service concept that

allow for the service offering to be made available" (2002: 138). The authors support this idea in the fact that services result from a sequence of interactions between participants, processes and physical elements; and therefore any changes in the service concept, requiring distinct competences from the actual operation may be seen as a new service (Menor et al., 2002).

Therefore, we use Lovelock's assumptions in our study. On the one hand, it is the most cited approach among researchers; and on the other hand, the majority of other classifications in the literature, also incorporates this idea of continuum, but gives different names and descriptions.

Furthermore, another idea that is important to clarify on the field of operations management refers to the concepts of external and internal newness, because they relate not only to strategic options about the configuration of the service offering, but also to the customer/market perceptions of the new service. Thus, external newness refers to "the novelty of the service as the customer perceives", and the internal newness "captures what exactly must be developed and put in place vis-à-vis the service concept for the new service to be operational" (Menor et al., 2002: 139).

Concluding, service innovation was originated as a complement of product innovation, with a significant technology dimension. Currently, it covers diverse functions of organizations, involving not only employees but also customers, with a central focus on the relationship between those two parts.

It is a complex field of research, where it is difficult to find consensual theories. Indeed, in our way to find a definition for new services, we found that different authors propose different definitions or classifications of innovation. It would be useful further research; on the one hand, it would help investigators clarify innovation definition or classifications. On the other hand, managers would also benefit from a better understanding of innovation, if it would decrease complexity, costs and risks associated with determinant strategic decisions.

Overall, we argue that innovation is closely related with change, either in something that already exists or in something totally new. We also agree with the existence of a continuum from radical to incremental innovation, because

innovation can occur in different levels of intensity. Consequently, a new service is a service that differs from a previous one, as a result of a change either incremental or radical.

Based on the assumptions previously mentioned regarding today's crisis scenario, and firms struggling to develop strategies of cost awareness, we present innovation in the remaining chapters, more related to incremental innovation than radical innovation. Incremental innovation leads to improvements in actual products and services, focuses in reducing the unit cost of the product, and are market oriented. Moreover, "incremental innovations enhance existing skills in the company" (Dantas & Moreira, 2011: 10), which is fundamental to implement the concepts of architecture and modularity that we introduce in chapter 3.

Now that we defined what we intend as being new services, we answered our first partial question "What are new services?" We can move forward investigating how new services are developed. In the next section, we explore the literature of NSD to understand how firms, generally, develop new services. We wonder if firms use a formal systematic process that can be standardized among different NSD, or in turn if they develop new services with distinct processes depending on the new service, or even if they don't use any NSD process at all. Then, in the case of firms that establish a NSD process, we aim to identify the stages of that NSD process.

2.2. NSD process

In this section, we analyze how firms develop new services. Firstly, we investigate whether firms assume that new services "just happen", rather than through a systematic development process; or otherwise, they design an appropriate NSD process. Secondly, we identify diverse NSD processes. Finally, we address the multinational context, to examine how firms develop services in two countries at the same time.

The existing knowledge of NSD process emerged from the current understanding of NPD process. Nevertheless, according to the literature, the use of a systematic process for developing new services is not used by many service firms (Alam, 2011). Indeed, “until recently, the generally accepted principle behind NSD was that new services happen, rather than occurring through formal development processes” (Menor et al., 2002: 136). More recently, a growing number of authors refer that “successful services can and must be systematically planned because a stage-wise development process has been shown to be invaluable to many firms” (Alam, 2011: 590).

Johnson et al. (2000) present a review of NSD processes, and conclude that on the one hand, those models provide valuable information concerning the identification of NSD process stages and activities; and on the other hand, available models are industry-specific with lack of empirical work to enable standardization to different service industries. Specifically, NSD models can be categorized into three groups (Johnson et al., 2000): (1) partial models – concerned only with a part of the whole NSD process (e.g. “Shostack’s Model of NSD” focuses on the activities required to create a service blueprint); (2) translational models – based on the Booz, Allen, & Hamilton (1982) NPD model (BAH model), which encompasses seven steps to develop a new product from idea stage to commercialization, and it is presented as a systematic and formalized process that is in the basis of several NSD models; and finally (3) comprehensive models – attempt to represent the NSD process holistically, this is, it analyzes the process in an integrated perspective. We choose to follow this last group in our study.

Among distinct NSD processes identified in the literature, we decided to focus on two: “The NSD process cycle” (Johnson et al., 2000); and “Two models of NSD” (Alam & Perry, 2002). The former appears to be more relevant, as it is one of the most cited among the literature; and Alam & Perry’ (2002) is in the basis of our further cross-country NSD analysis.

In his cross-national research on NSD, Alam (2006, 2007, 2011) applies in his case studies a model with ten development stages, proposed by Alam & Perry (2002). The authors present two versions of that ten-stage model, one is linear,

and the other includes parallel stages, as shown in Figure I. It was designed based on the case studies of several Australian service firms and incorporates the stages of strategic planning, idea generation, idea screening, business analysis, formation of cross-functional team, service design, personal training, service testing, test marketing and commercialization.

In spite of the similarities between some of the ten development stages proposed and those reported in previous service development studies (e.g. BAH model), Alam and Perry' model is simplified and improved, because it encompasses fewer development stages (reduction in bureaucracy comparing with previous models), it includes a key stage of "formation of cross-functional team", and it incorporates customer input (Alam & Perry, 2002).

Furthermore, the authors argue that ideally managers should develop a linear system that includes a formal process for carrying out developing activities from idea generation to commercialization. However, in some cases, a parallel processing of some stages may be beneficial, as it would speed up the overall development cycle (Alam & Perry, 2002). As shown in Figure I, three pairs of stages can be conducted at the same time: "strategic planning and idea generation"; "idea screening and business analysis"; and "personnel training and service testing and pilot run" (Alam & Perry, 2002).

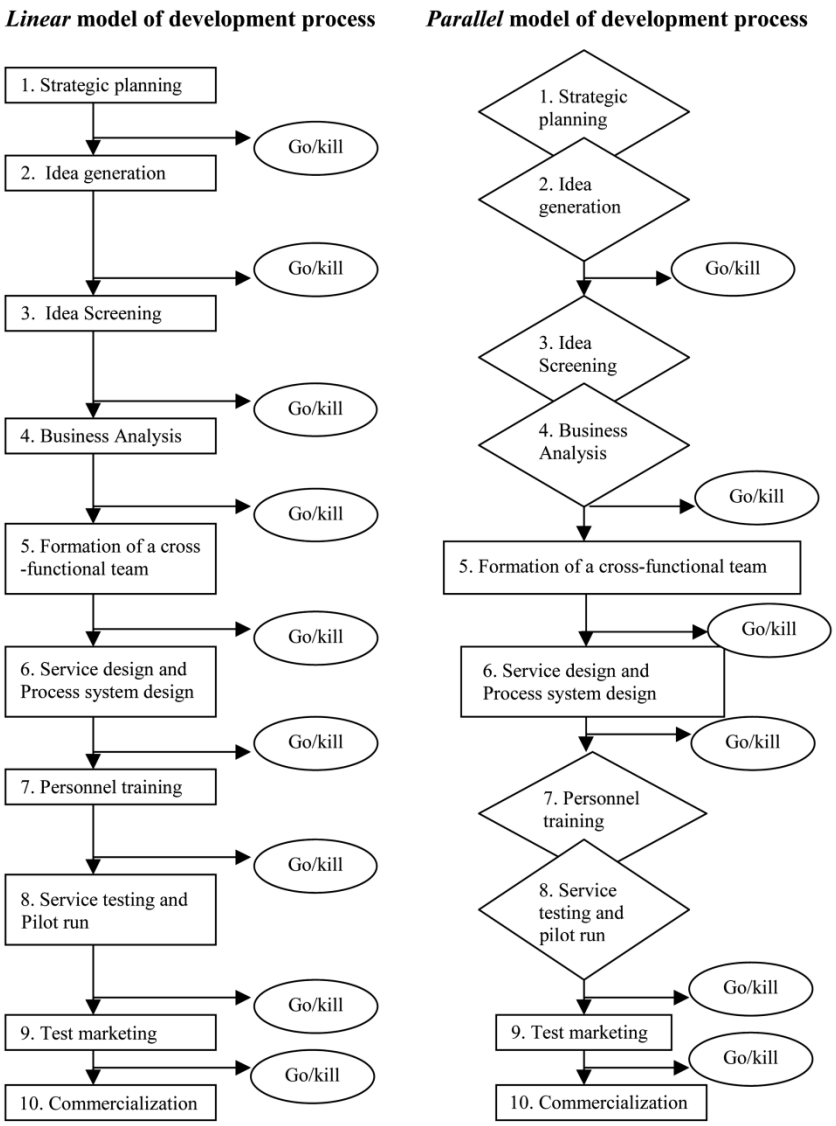

FIGURE I – Two models of NSD
Source: Alam & Perry (2002: 525)

The NSD process cycle proposed by Johnson et al. (2000), also agrees with breaking down the process into different stages (Figure II). However, it highlights the nonlinearity of the NSD process and the importance of “enablers”, such as teams, design tools and organizational context, to facilitate the (re)design of the service delivery system. The cycle represents a progression through four stages (design, analysis, development and full launch). The first two stages represent the planning phase of the NSD process cycle, including decisions regarding market viability, internal resources, and capabilities. The last two stages represent the execution phase, where the service delivery

system design, use of enablers, and cross-functional developments become critical management issues (Johnson et al., 2000).

In both phases, expertise is an indicator of NSD competence, whose development "requires the formalization of a NSD process that supports greater NSD speed and effectiveness" (Johnson et al., 2000: 18). Although the tendency of services to use less formal NSD processes than those found in NPD (Griffin, 1997), the NSD process cycle described captures that formalization. While the service firm innovates, enablers facilitate the NSD process cycle, having a positive impact on the NSD cycle time and allowing service developers to design the service delivery system in a way that the needs of customer are matched by the service offering (Johnson et al., 2000).

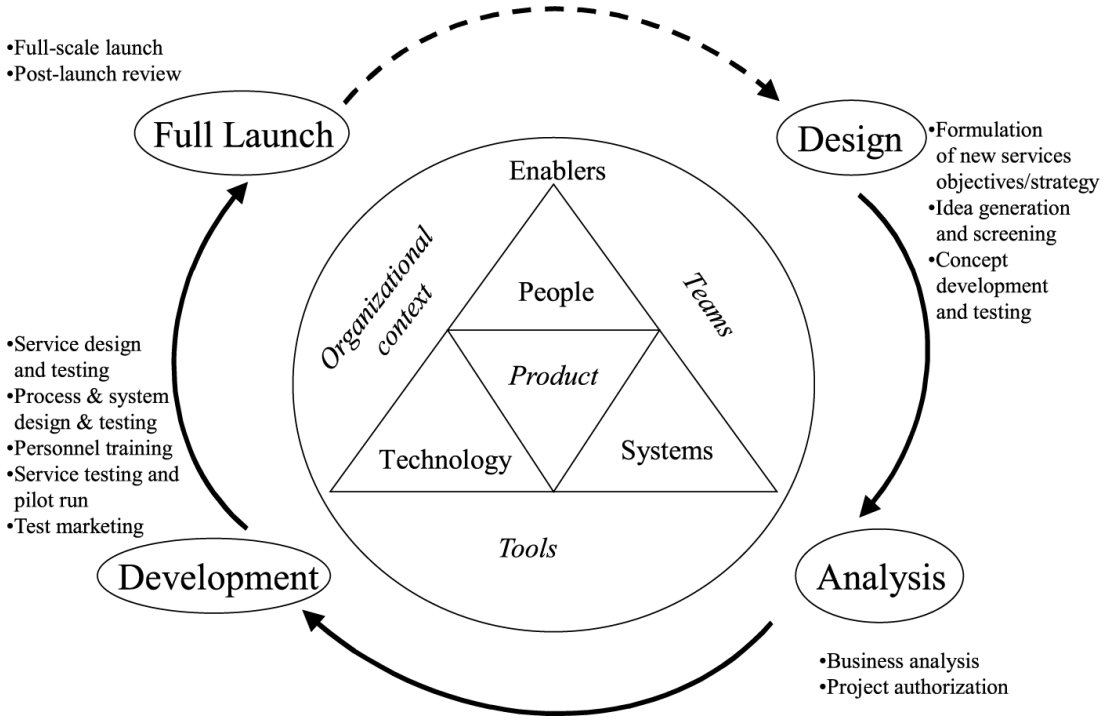

FIGURE II – The NSD process cycle
Source: Johnson et al. (2000: 18)

Actually, firms feel obligated to deliver a continuous improved offering to customers, which generates a requirement for creating new services, not only to satisfy customers' needs, but also to go beyond their expectations. Despite our initial belief that firms should develop a formal NSD process, we found that many firms still develop new services without that formal planning process. One

possible explanation is that existent frameworks are either from the field of products or too industry-related, which unable the standardization of processes and activities. This represents a gap in the literature on NSD process that should be filled with further empirical studies.

Analyzing both Alam and Perry' (2002) and Johnson et al.' (2000) enabled us understand that firms should have a systematic NSD process, encompassing a sequence of distinct stages. In the first case, Alam and Perry (2002) propose ten stages, from idea generation to commercialization; while Johnson et al. (2000) suggest four stages (design, analysis, development and full launch). Although they name them differently, the stages of each model are similar, and they both agree in the need for customer participation and interaction along the process, supporting the continuous improvement of the process considering customers' needs and preferences. However, the NSD process cycle (Johnson et al., 2000) appears to be more interactive and with better application to reality, so we decide to use it in our study.

So far, we know the process that firms typically adopt for the development of new services. However, we don't have specific knowledge about the process used by firms to develop new services in two different countries, simultaneously. In the next section, we explore the NSD process at the multinational level.

2.3. NSD at the multinational level

The management of NSD is a variable considered by firms in competitive environments, and it is used as a service competitiveness driver (Menor et al., 2002). Additionally, competition in service industry has become more and more intense which led firms to start searching for opportunities abroad (Alam 2007). At the multinational perspective, the growing importance of services in the world economy, in particularly due to the globally expansion of services, made it meaningful to clearly understand how services are developed in different countries.

When analyzing the NSD at the multinational level, we consider a firm that is presented in two or more countries at the same time, and desires to develop a new service in those countries, simultaneously. Thus, we wonder whether firms change the NSD process used at home and if they change it, how do they do it? In other words, do they adapt their stages and processes to local characteristics or do they standardize one unique process? Do they standardize the entire process or only some parts of it? Also, do they develop all stages in each country or, for instance, they establish the idea generation in country A and test it in country B? Or even, does a firm identify customers' needs and expectations in one country and test the service in another? These are some of the questions that we would like to explore in order to answer our third partial question "how do firms develop new services at the multinational level?"

It is important to recognize that different countries may have different ways of developing services. Indeed, when managers decide to introduce new services in a different market, they have to carefully understand how services are developed in that particular country; otherwise they won't be successful (Alam, 2007). They have to consider some country specific characteristics that may influence a firm's marketing/operations strategies, such as, its social-economic and cultural environments. Even if some firms from developed nations impose its home market strategies on emerging and developing countries, it would be better if they adapted their business practices to the emerging country environment and try to gain some benefits from the differences between nations (Alam, 2011).

Previous literature on the NSD have already provided cross-national studies focusing on cultural differences in the innovation process (Alam, 2007), and in the NSD success/failure factors (Alam, 2006). Still, there is a gap on the literature focusing exclusively on the field of services, and answering the question "Are there any cross-national differences in NSD strategy and process? Or in the multinational NSD process?"

There are a few studies presented in the literature (Alam 2006, 2007, 2011) which investigated how services are deployed both in developed (U.S.A. and Australia) and developing (India) countries, in a cross-national comparative

analysis. The research questions proposed were: “What are the cross-national differences in NSD stages? What are the cross-national differences in the types of new services developed by service firms? And what changes do service firms make in their NSD practices while developing services in a foreign emerging market?” (Alam, 2011: 591). The purpose was to investigate on the one hand, the extent to which it is possible to transfer findings and concepts of NSD from one country to another; and on the other hand, the author explored the challenges and opportunities that a firm from a developed nation may have to face when developing new services in an emerging economy (Alam, 2011).

The author applied the same methodology in the three empirical sites (Alam 2006, 2007, 2011), and he used exactly the same research design in the different countries analyzed. Sampling was composed only with local firms (local subsidiaries or multinational firms were not considered), to avoid country bias and misleading results. All the respondents were characterized as “experienced practicing managers in service development or a related position” and “closely involved in their respective NSD projects” (Alam 2006, 2007, 2011). Table III presents the main characteristics of the key informants who responded to the questionnaires.

	(Alam 2006)		(Alam 2007)		(Alam 2011)	
	U.S.A.	Australia	U.S.A.	India	Australia	India
Sample (nº of firms)	274	262	264	222	254	212
Informants' organizational titles	marketing manager (45%) new product manager (22%) product manager (18%) service delivery manager (8%) CEO (5%) market research manager (2%)		marketing executive (43%) new product manager (22%) product manager (8%) managing director (9%) customer service manager (12%) CEO (6%)		marketing managers product managers vice president customer relations managers new product managers	
Informants' tenure with their firms	6 - 18 years		9 - 13 years		7 - 11 years	
Informants' mean number of years of experience in the NSD area (present and previous employment)	11.6 years		7.4 years		n.a.	
Informants' average of NSD projects	16 projects		11 projects		13 projects	

TABLE III – Informants’ characteristics on NSD cross-national analysis

Source: adapted from Alam (2006, 2007, 2011)

Particularly, in the case of India, it was required assistance from a leading Indian business school, because “in an emerging country, collaboration with a

local researcher is an important means of obtaining reliable and valid information" (Alam, 2011: 593). Along with previous innovation studies, the author asked information concerning the most recently new service project completed by the respondents. He argues that respondents would have "better memory of new service projects in which they were most recently involved" and it could "minimize the social desirability bias in the selection of projects" (Alam, 2011: 593) because informants might prefer to select projects that would benefit its firms.

Results support the existence of cross-national differences concerning a firm's new service strategy and NSD process. They show that through the innovation process the importance of its stages may vary (Alam, 2007) and managers involved in the NSD must consider some key issues related to the service development stages, such as, the strategic posture of a service firm, and its manager perception regarding the benefits of pioneering innovations. On the one hand, a firm developing more innovative services should privilege the stages of idea generation, idea screening, formation of cross-functional team and personnel training. Also, customer involvement plays a key role in the idea generation and test marketing stages, because they "can help crystallize service concepts and critically evaluate the overall service delivery blueprint and final offerings" (Alam, 2007: 51). Instead, a firm that develops moderately innovative services focus on the business analysis and commercialization stages of the NSD process. On the other hand, a highly innovative service takes more time to develop and consumes more resources, whereas a low and moderately innovative service costs less and can be rapidly introduced in the market. In fact, the risk associated with the development of an innovative service is higher than in other types of new services, which can indicate that the culture of risk taking may be an influence on the new service strategy adopted by a service firm.

Overall, managers in the U.S.A. and Australia seem to typically develop highly innovative services, and focus on the initial stages of idea generation and idea screening with high degree of customer interaction. Instead, Indian managers mostly develop moderate and low innovative services, and focus on the business analysis stage, in order to make an adaptation of concepts and

services that were developed abroad and proved to be successful. Further analysis comparing these conclusions with a country study would make sense, because we argue that the conclusions would not be different. Also, we don't have information regarding if the project that was being considered was representative of informant's typical project, that is, we are not sure if the most recently project each informant completed was similar to his usual project. Consequently, given these conclusions, we don't know if projects considered were representative of a typical NSD process, and further research would be necessary to a clearly understanding.

These studies provided valuable information for managers that already invest in those countries and for those who are looking forward to entry in those countries. It can also be an example to be followed in further cross country comparisons. However, these comparisons present some limitations, for example they are based on specific countries and it is not possible to make standardization of results to other countries or regions.

In summary, at the multinational level, we aim to investigate how firms develop new services outside its country boundaries. We found several papers addressing internationalization and exportation of services, from different fields of management and perspectives, such as, strategy, marketing, operations and engineering. After all, we conclude that the literature on NSD at the multinational level is still meager and it lacks conceptual and empirical work detailing this context.

We found a few case studies regarding the introducing of NSD processes in different countries and industries, however the majority focused on a single country or region, which provided limited data (domestic information) that may be accurate only for that specific country or region. Nonetheless, the only exception we found in exploring the cross country dimension, was Alam (2006, 2007, 2011) who investigated how new services are developed in two different countries. It was interesting to compare results from different realities, in both developed and under developed countries. In his research it is offered a comparison between countries, with data collected from country-based companies and results that provided valuable information in how firms from

different countries and regions develop new services. Most importantly, it shows that innovation, strategies, processes and managers attitudes depend on the country context.

Overall, regarding our initial questions, we may say that it is important that a firm develop a systematic model of NSD, which encompasses a sequence of distinct stages. However, we cannot define how new services are developed in two different countries, at the same time. Indeed, we don't know, neither the extent to which a firm's NSD process may change when it is developed, simultaneously, in more than one country, nor how that process is designed (e.g. which stages are required? where do firms develop each stage?). Thus, further research is required to deeper the understanding of this issue.

We are still not able to respond to our main research question. As service design is the outcome of NSD, in the next chapter we explore the field of service design to get a better understanding of the process. We intend to clarify the concept of standardization and, consequently, to get insights that enable us to explain the concepts we introduced in this chapter and that might help us advancing some hypotheses with regard to NSD at the multinational level.

CHAPTER 3 – SERVICE DESIGN

In this chapter, we explore the field of service design, looking for complementary insights to our understanding of how firms develop new services at the multinational level. Particularly, we investigate recent initiatives, theoretical investigation and empirical research that enable us to understand the developing of new services in different countries simultaneously. We choose the field of service design because we assume there is a connection between both the field of NSD, and the field of service design. When firms define the development of new services they end up with a specific design. Therefore, we start distinguishing the concepts of service design and NSD. Then, we introduce the concepts of architecture, modularity and platforms. Finally, we link those concepts with the NSD at the multinational level.

The concepts of service design and NSD are closely related, but distinct in its definition. Service design relates to the detailed structure, infrastructure, and integration content of a service concept (Menor et al., 2002) and of a service operations strategy (Johnson et al., 2000). NSD refers to the whole process of developing new service offerings. The former tends to be the outcome of the latter. Johnson et al. (2000) identify distinct NSD definitions in the literature – “service creation” (Bernstein, 1990), “new *product* development for services” (Storey & Easingwood, 1993) and “NSD process” (Cooper, Easingwood, Edgett, Kleinschmidt, & Storey , 1994) – with a common agreement in the importance of breaking the NSD process into stages. Thus, questions about design are important concerns of the NSD.

According to the literature, despite external differences between physical goods and nonphysical services, there are similarities in the principles of design and development of new products and services. In both contexts, firms have to segment the market into customer groups, comprehend user needs in different segments, design effective solutions, capable to be competitive and differentiated, and carefully define the distribution and integration of either the product or service with other products and services. Moreover, these similarities “continue downstream in the business process where the marketing literature suggests that whether product or service, it is essential to identify and promote

the intangible concepts that appeal most to prospective customers" (Meyer & DeTore, 2001: 1). In the field of services, it is harder to understand customers' needs and define the process of delivery, because of the intangibility of some components. And more, the simultaneity of the offer allows the definition of the customer needs to be dynamic. It also affect the relationship between firms and innovation, thus Bitran & Pedrosa refer that "it makes the precise definition of a concept and its subsequent design difficult at best" (1998: 170).

A dominant service design is "the set of tangible and intangible elements implemented by functions that are essential for that service (core functions) and functions that support the service experience (peripheral functions)" (Bitran & Pedrosa, 1998: 170). It is important to note that every new feature offered by a firm to enhance the service experience – either tangible (e.g. in-flight meal) or intangible (e.g. convenience, speed) – will be followed by competitors and it will, eventually, become part of the industry standard. Consequently, customers' expectations will be affected and the new feature becomes part of the dominant design (Bitran & Pedrosa, 1998).

Bitran & Pedrosa (1998) refer to Abernathy & Utterback's (1978) product evolution model as one model that, although being product based, it brings insights to service context as well. Accordingly, the evolution model starts with the introduction of the product in the market (through a major innovation), then product adoption grows (variety of designs compete for customer acceptance), then a product dominant design emerges and, thereafter products change through incremental innovation.

Another major insight introduced by Britran and Pedrosa's (1998), is that the process of service development entails the conception of component designs (identifying changes in people, service offerings and infrastructure) and architectural knowledge (demonstrating how design components are linked together without changing the core service). Moreover, Menor et al. (2002) identified the development and application of the concepts of architecture and modularity to the NSD process as a key research challenge. This is in concordance with a new trend of designing services, related to the concepts of

“architecture”, “modularity” and “platforms”, which we analyze in the remaining part of this chapter.

3.1. Architecture, Modularity and Platforms

Currently, there is a stream of research arguing “that a particularly effective way to renew a product family is not to upgrade the family one product at a time, but rather, to structure and implement new common designs and component technologies that can be used across all the products of the family” (Meyer & DeTore, 2001: 189). Thus, it seems that sharing (technology, knowledge and tools) can be a suitable solution for firms to deal with consistence and customization. It creates variety at low costs, through a strategy that enables firms to identify and exploit commonalities among their offerings, target markets, and the processes for creating and delivering offerings (Schmidt & Skold, 2011).

In the literature, the concepts of architecture and modularity have been studied in the field of NPD (Menor et al., 2002). Researchers argue that these concepts help manufacture firms to achieve customization and efficiency, when responding to customers’ needs. However, in the field of services, architecture and modularity are a recent theme of research, and has recently started to be considered, mainly in the service design field.

Next, we introduce the concepts of service architecture and service modularity. To a better understanding of this field of research, we define a service “as a system delivering various services through a combination of distinct building blocks or modules” (Voss & Hsuan, 2009: 545), in which each module is formed by a group of component systems and processes. The service may then be created individually by the customer or the service provider, as a result of a “mix and match” of distinct service modules and/or service sequences (Voss & Hsuan, 2009).

3.1.1. Service Architecture

Architecture can be defined as “a design for products, services, and infrastructure facilitating network users’ interactions” (Eisenmann, Parker, & Alstyne, 2006: 96).

Product architecture decisions are strongly affected by the way systems are decomposed, and the selection and alignment between components (Mikkola, 2006). It can range from modular to integral arrangements. A modular architecture “includes one-to-one mapping from functional elements to physical components of the product, and specifies decoupled interfaces between components”. An integral architecture “includes a complex (non one-to-one) mapping from functional elements to physical components and/or coupled interfaces between components” (Voss & Hsuan, 2009: 543). For instance, if we consider the videogame market, we identify game systems (e.g. Playstation, smartphones) as an example of modular architecture, because the same box allows users to play different games, selected by themselves either inserting CD’s or downloading applications. On the contrary, the standalone arcade games (e.g. those machines located in store games that allow people to play certain games, such as “racing car simulation”) represent an integral architecture, because those machines only allow users to play selected games, and it is not possible for them to introduce any device with different games, limiting customization.

These concepts can also be applied in service architectures, because architecture and modularity relate not only to products, but also to processes (Voss and Hsuan, 2009). Thus, process modularity refers to the standardization of the manufacturing process modules, in order to make it easier to resequence modules and/or add new modules quickly, in response to changing product requirements (Voss and Hsuan, 2009). For instance, in the Consulting business, we identify an architecture, that encompasses both standardized processes (e.g. reports, process maps); and customized processes (e.g. modules that differ considering customer’s characteristics, for example, a company from telecommunications sector may require different legal issues comparing to another company from the health sector). Furthermore, to achieve

the most cost-effective customization, firms should order standardized processes prior to the customized subprocesses (Voss & Hsuan, 2009).

Particularly in the field of services, architecture can be seen as “the way that the functionalities of the service system are decomposed into individual functional elements to provide the overall services delivered by the system” (Voss & Hsuan, 2009: 546). Indeed, it is proposed a systematic view of service design (and architecture), decomposing the service system into diverse levels of complexity, converting “the service system and its related constituents into nodes (which can be either modules or service components) and linkages (i.e., interfaces)” (Voss & Hsuan, 2009: 545).

When conceptualizing service architecture, Voss and Hsuan (2009) propose an analysis of four different levels, taking into consideration “the degree to which the service modules are consumed consecutively and the number of modules available for a customer to choose among at a given time”: (0) industry, (1) service company/supply chain, (2) service bundle and (3) service package/component. They assume that it is possible to make a division into more than four levels. Next, we describe each level of analysis.

At the industry level, Jacobides, Knudsen, & Augier define industry architectures as “templates that emerge in a sector and circumscribe the division of labor among a set of co-specialized firms” (2006: 1201), these templates define “who does what” (how the value is created and how the labor is divided) and “who takes what” (in terms of value appropriation and division of revenue). Once an architecture becomes stable, it is developed a system of interfaces, which can consist of regulatory frameworks, rules, standards, and technological specifications that allow different players or constituents to connect (Jacobides et al., 2006).

At the company level, organizations design its own architecture, considering not only the company itself, but also its supply chain (upstream and downstream). Modular architecture enables system decomposition and, consequently, the opportunity of outsourcing company’s services; or service processes to others; or even becoming a supplier of services to others. Therefore, it is required a clear knowledge of the process architecture of services, as well as the

interfaces between them (Voss and Hsuan, 2009). As examples of architecture configurations in this level, we identify the multisite service organization – “a core plus a set of standard modules deployed across”; and product based – “a series of modular products are developed, often sharing the same components and information systems (IS)” (Voss and Hsuan, 2009: 547).

At the service bundle level, architecture includes “the individual service bundles that constitute the company’s level 1 service offering” (Voss and Hsuan, 2009: 547), and each bundle represents a set of modules. For instance, a firm may offer a simply basic module common to all services or, in contrary, it can offer a set of modules that can be configured for each segment, or even customized at an individual level (Voss and Hsuan, 2009). The service bundle level is consistent with an analysis of the front/back office concepts, where the previous refers to the part of the organization that interacts with the customer, in contrary to the later that has no direct customer contact. In both cases, it is possible to develop standardized processes, even though we typically find them in higher volume in the back office operations. Furthermore, back office can work “as a platform from which many different front-office services can be run” (Voss and Hsuan, 2009: 547).

At the service package/component level, a service component is “the smallest building block or module of a service system” (Voss and Hsuan, 2009: 548), within which standardization, uniqueness, degree of coupling and replicability are key characteristics, that can also affect the nature of the overall systems architecture.

We illustrate the four levels of service architecture previously described with an example of the video game industry, shown in Figure III. In Level 0 (industry level) we include the distinct players in this sector which includes game software, handheld devices, video game consoles, mobile games and online games; in Level 1 (company level) we consider an individual video game consoles company, for example, Sony, producer of Playstation 2 and 3, has its own marketing services, and also produces other type of products (e.g. PCs, photography camera, etc). Then, Level 2 (service bundle) consists of the console itself and its standardized services (easily replicated) and customized

services (unique to the company). These services may include controllers and accessories, games, entertainment (e.g. photo and video), online services, and health and fitness; and the degree of standardization may differ depending on the company. Finally, in Level 3 (service package) we consider service components of each level 2 service, for example, in the component Games, there are some options equal for all customers (standardized services), for example, free games included; and other special options/offers that may be customized to customer's preferences, for example, updated versions of games available in the internet under payment.

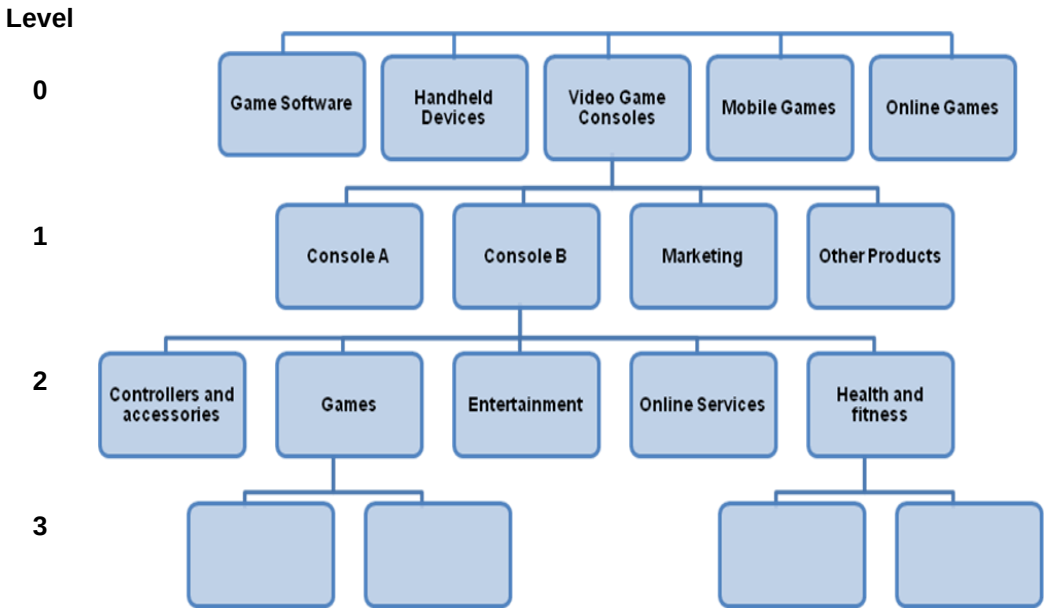

FIGURE III – Decomposition example of video game console services
Source: adapted from Voss and Hsuan (2009)

In our study, the last two levels appear to be more relevant, because our research questions take insights mainly from service bundle and component perspectives.

Overall, service architecture can be used as a tool to develop sustainable competitive advantage in services. On the one hand, when carefully designed it helps in minimizing cost and internal change; and, on the other hand, it should be dynamic, responding to external stimuli (Voss & Hsuan, 2009). Thus, designers play an important role in the definition and implementation of architectures, and currently they face some new questions: is it more

appropriated an integral or modular architecture? How unique or replicable should firm's modules be in each level? Where should firm locate the interfaces? Should interfaces be more standardized or specified? Furthermore, at the multinational level, companies considering the outsourcing of services to low-cost countries face additional issues, such as understanding the interfaces of each organization involved in their business, before replicating a new service; and define appropriate communication mechanisms to assure clear and effective flow of information and avoid other collateral cost or implications (Voss & Hsuan, 2009).

Also, when designing a service, we argue that managers should consider the concepts of hierarchy design and technological discontinuities. The hierarchy design refers to the fact that some components – either in products or services – are more relevant to the product/service concept and, consequently, their design choices impose constraints on the design of other components. Thus, "the outcome of the service design activity is constrained by choices made along the design process, depending on how early a decision is made concerning parts of the service operation, and how relevant those parts are to the service concept" (Bitran & Pedrosa, 1998: 171).

Technological discontinuity refers to "an innovation that either advances the price-performance frontier of the product by an order of magnitude, or changes the traditional process of making that product in such a way that it improves its cost or quality by an order of magnitude" (Bitran & Pedrosa, 1998: 171). Also, discontinuities can be described as either competence enhancing – promote small improvements in performance; or competence destroying – allow order-of-magnitude improvements in performance and make obsolete the older process or technology (Bitran & Pedrosa, 1998).

Generally, hierarchy design and technological discontinuities influence the success of service design, because it requires component knowledge – knowledge about the concept and functions of each component; and architectural knowledge – knowledge about how to integrate the components into a consistent whole (Henderson & Clark, 1990).

Moreover, designers have to manage “architectural innovation”, that is, those “innovations that change the way in which components of a product are linked together, while leaving the core design concepts (and thus basic knowledge underlying the components) untouched” (Bitran and Pedrosa 1998: 171). Thus, every time a main new characteristic is introduced to the product dominant design, both component and architectural knowledge regarding to this new characteristic are included in the underlying knowledge of the dominant design of the product. For example, the development of on-line stores – as a consequence of the advent of the Internet – enables a new kind of relationship between customers and the “store”; it not only eliminates the front-office but also changes the mode of interaction. Thus, architectural variations may lead to new product or service concepts, that is, “identifying components and analyzing links between them can also be a source of innovation” (Bitran and Pedrosa, 1998: 171).

In summary, architecture is a concept that emerged in the field of products, but can also be applied in the field of services, that relates to modularity and platforms. Service architectures may be either integral or modular, depending on how “loosely coupled” its elements are. In a service modular architecture, it is possible to “mix and match” elements, and continuously upgrade firms’ services throughout their life cycle (Bask, Lipponen, Rajahonka, & Tinnila, 2011). Consequently, it increases the number of service variations with unique functionalities, features or performance levels, through the substitution of modular elements into the service architecture, without the redesign of other elements (Bask et al., 2011). Overall, architecture and modularity are strongly connected, but what exactly is modularity? How can it be implemented? Why is it advantageous? We clarify this concept in the following section.

3.1.2. Service Modularity

Modularity can be seen as “the scheme by which interfaces shared among components in a given product architecture are standardized and specified to allow for greater reusability and commonality (or sharing) of components among

product families" (Voss and Hsuan, 2009: 543). Indeed, it is a source of customization, economies of scale and scope, and can facilitate outsourcing, through product structure modifications (Voss & Hsuan, 2009).

Modularity emerged as a result of the competitiveness and dynamism of today's markets. Firms were forced to enhance the value delivered to the customer and create an offering that, on the one hand, could facilitate flexibility and "taylorism" in response to specific requirements of customers; and, on the other hand, it could strike for efficiency through standardizing processes (Rahikka, Ulkuniemi, & Pekkarinen, 2011).

Therefore, modularity "has been recognized as a way to meet differing service requirements efficiently" (Bask, Lipponen, Rajahonka, & Tinnila, 2010: 368). It can be a source of competitive advantage, either due to the development of unique service modules (difficult to be copied by competitors); or due to the exploitation and replication of these specialized modules across multiple services or sites.

However, there is no universal definition of modularity and its interpretation, applicability and benefits are yet nonconsensual, in both product and service literature (Bask et al. 2010, 2011). Indeed, the lack of research on modularity in the fields of service marketing and management led some authors to explore the concept in the field of engineering and production management (Rahikka et al., 2011). Bask et al. (2010) identified four key research themes in modularity: product modularity; modularity in production and processes; modularity of organization and supply chain; and, more recently, modularity in services. These themes appear to be somehow coincident with those levels of analysis identified in architecture (industry, service company/supply chain, service bundle and service package/component).

The most frequently used definition of modularity refers to "building a complex product or process from smaller subsystems that can be designed independently yet function together as a whole" (Baldwin & Clark, 1997: 84). Each subsystem is constituted of a set of modules, whereas a module is "a unit whose structural elements are powerfully connected among themselves and relatively weakly connected to elements in other units" (Baldwin & Clark, 2000:

63). Thus, modularity assumes both “interdependence within and independence across modules” (Baldwin & Clark, 2000: 63). Moreover, each module has associated with itself a certain level of value-added content and complexity (Arnheiter & Harren, 2005), and it should not be too simple, because “the simpler the modules, in fact, the more modules would be required to partition the system, resulting in a complex, or inefficient, description of the system itself” (Salvador, 2007: 225).

More recently, Bask et al. propose a definition of modular system, as being “a system built of components, where the structure [“architecture”] of the system, functions of components [“elements”, “modules”], and relations [“interfaces”] of the components can be described so that the system is replicable, the components are replaceable, and the system is manageable” (2010: 366). The literature suggests that these concepts can be applied to design either products or production systems (Arnheiter & Harren, 2005).

In the context of services, modularity has been “closely connected to productization of services” (Bask et al., 2010: 366), and its discussion is highly influenced by previous research on product modularity. However, it remains unknown the usefulness of theories and concepts developed in the product perspective when applied in service-related context (Bask et al., 2010), due to lack of empirical research regarding the field of services, and little application of the concept of “modularity” in designing services.

Thereby, there seems to be a transfer of concepts and theories on modularity from the field of products and manufacturing to the field of services (Bask et al., 2010). Yet, it is important to consider the similarities and differences between services and products (Voss & Hsuan, 2009). They are alike in terms of systems and its constituents – in both cases, it is possible to apply the concepts of modular process, interfaces and modules. On the contrary, they differ in their nature, outcome and process, due to its simultaneously production/consumption and the role of people (front/back employees and active customers), which makes more difficult to distinguish between outcome and process. As a result, service might present higher characteristics of process modularity than product modularity.

Service modularity can be analyzed into three distinct dimensions: in services, in processes and in organization (Pekkarinen & Ulkuniemi, 2008), as it is shown in Figure IV.

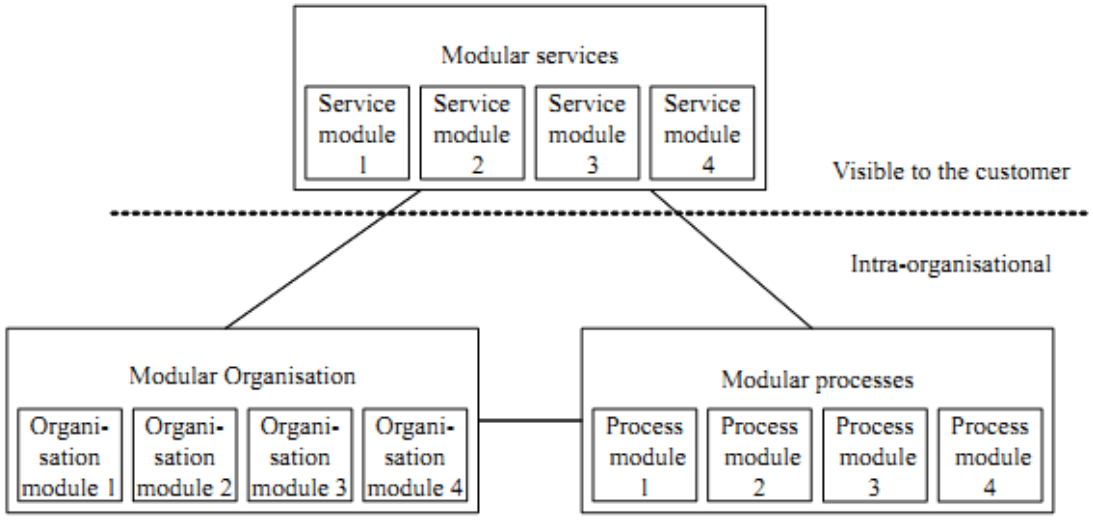

FIGURE IV – Three dimensions of modularity in services
Source: Pekkarinen & Ulkuniemi (2008: 88)

The modular service offering corresponds to the element visible to the customer, while the other two dimensions are intra-organizational and represent the means to generate the modular services. To develop customer's requested service elements, the service provider has to select the appropriate process and organizational modules (Pekkarinen & Ulkuniemi, 2008). Next, we explore each dimension.

A modular service results from the combination of "one or several service modules" (Pekkarinen & Ulkuniemi, 2008: 87). In turn, a service module can be defined as "the smallest service unit that can be offered to a customer in itself or as a part of a service offering creating the value perceived by the customer" (Rahikka et al., 2011: 358). For example, in the Consulting business, the smallest units delivered by such firms are service concepts, templates and tools (Schmidt & Skold, 2011).

Modularity in processes occurs through the combination of one or more modules (tasks), which are designed independently and then, joint together to respond as a whole to customer requirements (Rahikka et al., 2011). Indeed,

service process modularity is “the usage of reusable process steps that can be combined (“mixed and matched”) to accomplish flexibility and customization for different customers or situations in service implementation” (Bask et al 2010: 368). It enables the process to be broken down into standard sub-processes and customization sub-processes (Bask et al., 2010). For example, an ordering process encompasses two process modules, such as sending and receiving of orders (e.g. by phone or mail) (Pekkarinen & Ulkuniemi, 2008).

Services can be divided into functions, which execution is mandatory to produce a service that can subsequently be utilized in the production of other different services (Rahikka et al., 2011). Consequently, modularity in service design also affects the development of the organizational structure and enables “the use of core capabilities of a service producer” (Pekkarinen & Ulkuniemi, 2008: 87). As process modules may be divided into business units or outsourced to other suppliers, firms will choose the supplier best able to produce each module; therefore, there is a move from “tightly integrated hierarchy” firms to more reconfigurable “loosely-coupled” networks (Rahikka et al., 2011). For instance, in the automobile sector, producers (e.g. BMW) can specialize in core processes, such as, those which provide distinctive features for each car (e.g. design for comfort, speed, aesthetics) while outsourcing standardized parts (e.g. production of body material, tires). When opting for outsourcing rather to produce in-house, that firm will choose the more capable suppliers and the overall network becomes more loosely-coupled.

Organizational modularity refers to “a knowledge-based view of the organizational forms as being loosely coupled (teams, units, firms, networks) that through coordination create value that is perceived by the customer” (Rahikka et al., 2011: 359). Indeed, it is “a system of modular processes with low coordination” (Pekkarinen & Ulkuniemi, 2008: 87) – modular product architecture provides embedded coordination which significantly reduces the need for managerial coordination of development processes (Rahikka et al., 2011). Modular organizations aim “to accomplish flexibility to serve different customers and offer different services in the most efficient and profitable ways” (Bask et al., 2010: 368) through methods as outsourcing, contract

manufacturing, alternative work arrangements and the development of alliances (Pekkarinen & Ulkuniemi, 2008).

Implementing modularity can be advantageous for several reasons, such as: (i) the pre-existence of modules, which facilitates customization and make it more cost-effective; (ii) share of service modules increases the profitability of service delivery; (iii) reduction of complexity (and easier service system management) due to the definition of modules as bundles of distinct service elements and processes; (iv) and service development becomes easier due to the possibility of improving each module independently of the others (Pekkarinen & Ulkuniemi, 2008). Modularity also provides a broad variety of products/services and improves flexibility (Bask et al., 2010, 2011).

Overall, the concept of modularity encompasses five important dimensions (Voss and Hsuan, 2009): (1) interfaces; (2) degree of coupling; (3) components; (4) commonality sharing; and (5) platform. Next, we detail each one of these dimensions.

1) Interfaces

Interfaces refer to the linkages shared between components. Particularly, service interfaces may include people, information, and rules governing the flow of information (Bask et al., 2010). Thus, the role of people in services turn the interfaces more “soft” (human) than in products, which makes service modularity a more complex concept than product modularity (Bask et al., 2010).

Modularity enables the development of standardized interfaces between service components. These can be used by firms as a tool to implement a strategy of mass customization. Such a strategy enables firms to produce a wider variety of end products and services resulting from the reconfiguration of components (Pine, 1993), without increasing costs.

2) Degree of coupling

The degree of coupling refers to the extent to which product or service architecture, in terms of its components and interfaces, is tightly or loosely linked. In the first scenario, in a tightly coupled architecture, there is a certain

degree of interdependence among system's constituents (Voss and Hsuan, 2009); whereas in the second scenario, in a loosely coupled architecture, relations can be loose, enabling the possibility of breaking down the system into smaller units or modules (Salvador, 2007), and the architecture becomes more modular.

When components are loosely coupled, there is a low degree of coupling and they are relatively independent of each other, enabling the separability, recombination and substitution of components.

3) Components

A component is a "physically distinct portion of a product that embodies a core design concept and performs a well defined function" (Mikkola, 2006: 132). It can be classified as either standard or new to the firm – depending in whether the firm has already known or used it before; and it can be customizable, enabling a firm to create wider product variation (Mikkola, 2006). Thus, as firms develop standardized components, its architecture becomes modular.

In the field of services, researchers use the term "service elements" as an equivalent for "product components", and they are defined as "the smallest units into which services are divided" (Pekkarinen & Ulkuniemi, 2008: 87). Then, a final modular service results from the combination of one or several service modules, as it is shown in Figure V. Each module is constituted by one or more service components or processes, offering one service characteristic (Pekkarinen & Ulkuniemi, 2008).

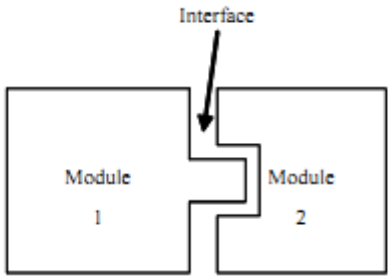

FIGURE V – A final modular product or service with two modules and one interface
Source: Pekkarinen & Ulkuniemi (2008: 87)

As we identified in products, customization is evident in service components, for example, when designers develop standardized components. It becomes even more important than in products, because service modules can be a source of added value in customers' perspective. Indeed, they may work as a supplement to the customer's core product, as modules' flexibility enables buyers to reduce the costs of adding services to the core product whilst increasing the customer value perceived (Rahikka et al., 2011). For instance, if we recall the example of the video game console company, each new service that a customer adds to his console (e.g. game, additional accessories, online services) is at a lower cost than if he did not have the console and wanted to experience those individual activities. Also, some of those additional services may require the previous acquisition of the console (e.g. games), and others may not (e.g. some online services). In the end, it increases the overall value perceived by that customer regarding the experience delivered by his console.

4) Commonality sharing

Commonality sharing occurs when the same version of a component is used across multiple products or services. It enables the development of economies of scale (from standard components), economies of scope (from unique components), rapid product development, and shorter lead times for production and time to market (Voss and Hsuan, 2009).

Managers face the question: "How to deliver a unique offering and, at the same time, make it low cost?" On the one hand, when developing standard components, firms use their actual resources, which decrease costs of product and service development as well as other fixed costs of production. On the other hand, if firms invest in developing unique components, it can increase both firm's performance and value, particularly if components can be shared across service families (Mikkola, 2006). Overall, we believe that commonality sharing may be a valuable tool to help managers define an appropriate answer, and the key decision may be in how many standard or unique components to develop and which functionalities they should have.

5) Platforms

There is no consensus regarding the definition and interpretation of service platforms. However, it refers to the process of renewing a product family through a re-structure and re-design of a firm's resources, in order to enable a sharing of common designs and component technologies by the whole family of products (Meyer & DeTore, 2001). Thus, it enables the renewal of the entire family at a time, contrary to the past trend of upgrading one family product at a time. Specifically, in the field of services, the nature of platforms may differ whether it is formed mostly by process components (e.g. standardized services) or product components (e.g. customized services) (Schmidt & Skold, 2011). For instance, a firm that offers Leadership Training services may have standardized courses (high degree of repetitive processes, such as activities for course administration, capable to be adopted for customers from distinct industries); and customized content for each course that would be tailored according the specific customer needs (e.g. the content for a marketing company would be different from a financial company).

When firms – either product-making or service-providing – adopt a platform management, they should consider five basic principles : (1) "convencional" definition of product platforms as being "common architectures spanning multiple products that are implemented with common subsystems and subsystem interfaces"; (2) Nonmonolithic or modular approach to platform development, in other words, it means to see "the major subsystems and the interfaces between subsystems as the product platform"; (3) Platforms extend beyond technology to both markets and business models, making it possible to explore new markets and create new business models; (4) Common product architecture, subsystems, and interfaces all have within them deeper insights, technologies, and processes that are the crown jewels of the corporation; these building blocks must be updated overtime, responding to market changes and technologies advances; and allowing a firm to continuously create new competencies; (5) Important implications for the organization of the enterprise (Meyer & DeTore, 2001).

In summary, the concepts of architecture, modularity and platforms were firstly introduced in the context of products and then transferred to services. However, due to its newness, the related literature is still meager and it is necessary more empirical studies (Menor et al., 2002) to clarify its definition, interpretation and application. We found more agreement among authors when presenting those concepts' advantages, than in defining and interpreting them. Nevertheless, the advantages identified are yet more theoretical than empirically demonstrated (Bask et al., 2010); and it is difficult to identify either the extent of benefits that this new trend can provide, or the dissemination of insights from one industry to another.

We argue that architecture, modularity and platforms are closely correlated and refer to the same possibility of firms develop small parts of the product/service in a separate way, and then make multi-combinations of those called "modules", which will result in a wide variety of distinct products and services. When created separately from each other, each single module has specific characteristics that in different combinations may result in different final products and services with distinct functionalities. When correctly designed, it is expected that firms reduce costs and, at the same time, increase flexibility in their offerings. On the one hand, delivering a service module may help customers decrease the cost of additional services they buy to supplement the core product/service, whilst increasing the value perceived by the customer. On the other hand, they will produce standardized modules which will respond (within a final product or service) to "customized" customer needs.

In the context of services, modularity affects the entire firm, as it can occur in firm's services, in its processes and in its organization (structure). Indeed, these three dimensions can be divided into smaller parts, enabling wider service variations, division of work, and outsourcing activities among a firm's network. Actually, a firm can choose its suppliers based on its competence to produce a certain module and then, through coordination mechanisms that firm will create the final value delivered to customers.

From this literature review we can propose the following diagram (Figure VI).

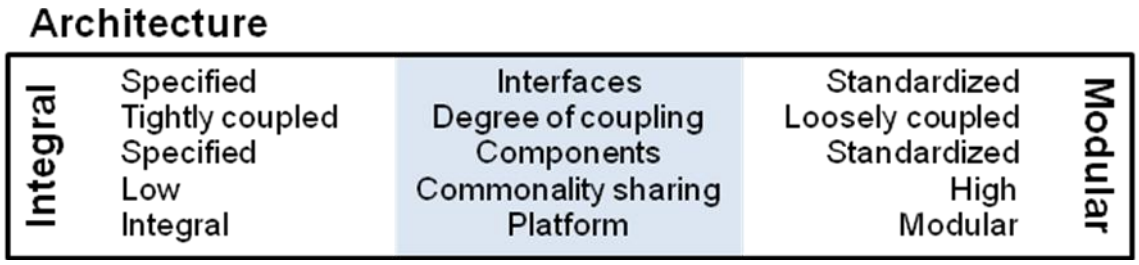

FIGURE VI - Architectural service design

Architecture and modularity may have distinct levels of analysis. In the case of architecture: industry level, service company/supply chain level, service bundle level and service package/component level. And in modularity: services level, processes level or organization level. Within each level we propose this diagram as a synthesis of options that can be taken in service design. With regard to our framework, it would be interesting to find out how this framework might help in understanding the processes of developing new services at the multinational level. In order to do so there is a need to measure each dimension. We propose that it should be done in further research.

After all, we believe that modularity may be a useful tool, not only to enter in new markets, but also to improve a firm's performance in the current ones. Recently, firms became more aware about its relationships with suppliers and other partners of its business. Within the literature, we found firms that started reducing the number of direct suppliers and investing in the relationship with a selected group of supplier partners. Indeed, modularity enabled the possibility of a smaller group of suppliers sell larger and more complex parts of a product, and led to a consolidation of the supply network (Arnheiter & Harren, 2005). These partnerships may enable knowledge share, which lead firms to continuously learn different ways of operating. For example, a firm may learn how to increase its efficiency by analyzing a supplier operation.

Given this increasing flexibility that modularity appears to bring, and the advent of international services pursued by many firms, we wonder how (or if) firms that operate simultaneously in two countries apply modularity in NSD. We explore it in the next section.

3.2. Modular NSD at the multinational level

In this section, we link the previous concepts of architecture and modularity with the NSD at the multinational level. We seek to understand how firms can apply modularity in developing new services, simultaneously, in two or more different countries. At the multinational level, how to define the modules and platforms and at what level? When, where and who should finalize and customize the service offer? These are some questions we explore in this section.

Today, globalization and service economy challenge firms to continuously develop new ways to create customer value and, at the same time, keep competitive in the market. In the previous section, we presented modularity as a strategy that firms adopt to achieve flexibility and efficiency, enabling firms to concentrate on its core business and outsourcing non-core activities (Pekkarinen & Ulkuniemi, 2008). Furthermore, if we recall chapter 2, firms started looking for growth opportunities overseas, and as a result, they operate simultaneously in more than one country.

Actually, they have a wider market, which means they have to satisfy more customers and more diversified needs, which requires a higher level of knowledge (e.g. markets, customers, resources and technologies). Initially, firms had to recognize both new market's and customers' characteristics, in order to satisfy current needs. But, in the course of time, firms desire to identify future needs, and even develop new services based on those new countries and contexts where they were established.

Thereby, we wonder how modularity and the whole flexibility it appears to offer – in service, processes and organization – can affect this multinational strategy pursued by companies. As we defined, a service results from the combination of one or several service modules and it is visible to the customer. In the case of service processes, we argued that a service production process is the combination of one or several process modules, which can be information processing or physical operation. Then, we described modular organization as the combination of organization modules, and a means to employ, in a flexible way, firm's own and other firms' resources. Moreover, we concluded that

modularity in organization can also be achieved through diverse organizational structures and supply network configurations. Consequently, we argue that we need to consider those three dimensions when developing modular services.

In the multinational context, managing those dimensions becomes even more important. Indeed, when applying modularity in a multinational strategy, firms should start analyzing both current markets and competitors, and decide which markets, customer needs and segments present the most promising growth opportunities. Then, based on customer knowledge, and services and processes' related technology, firms have to clearly define which service modules enable providing the customer with the desired new service (Pekkarinen & Ulkuniemi, 2008). Next, they can identify the country – in terms of resources availability and quality – that better fulfills its offering requirements, and thus develop different models in different countries, independently of the place of delivery. For instance, a firm that operates in Portugal, Spain and France, can produce module A in Portugal and module B in Spain, and then, deliver the final service in France and Portugal. Consequently, firms' structure and network is designed and all partners "share common knowledge, competencies and resources in service development" (Pekkarinen & Ulkuniemi, 2008: 89).

Nonetheless, we did not find empirical studies that validate this perspective of a single company producing modules in different countries; instead, we found similar descriptions using the concept of outsourcing, which implies contractual relationships between two firms. Such a strategy enables a firm to focus on its core competencies, developing the service modules that provide differentiation and competitive advantage; and outsourcing the other modules. Also, the integration of external suppliers and customers into the process of NSD seems to optimize the overall performance of all partners in the supply chain, as well as, it enables a firm to acquire knowledge and resources (Lau, 2011) that can be important in the NSD.

We relate those examples, because if two firms from different countries can separately produce two models of a final service, we suppose that a firm operating in two different countries could do it, as well. However, it is still

unclear which models to produce and where; and who and where should customize the final service.

We contend that modularity affects the entire supply chain network, and allows firms to improve its ability to customize products and services to distinct market segments and customers, while reducing costs (Pekkarinen & Ulkuniemi, 2008). Indeed, time and cost of developing a new service may be lower, because some of the required resources are already used by firms. Therefore, there is no need for further knowledge, tests or investments. For instance, firms already know how to produce actual components, they are already tested and the equipment and facilities required are already available. Also, modularity reduces the cost of production and delivery of services, because services share higher volume of parts (components). Moreover, as services are divided into smaller modules, firms can easily monitor and assess each module and continuously improve its components and processes. Consequently, the overall service quality may be easily improved (Pekkarinen & Ulkuniemi, 2008).

Overall, at the multinational level there is a gap in the literature regarding the use of modularity. We only found examples of region warehouses that centralize a firm's stock in substitution of national warehouses in each country a firm operates (Bask et al., 2010). We found a similar example of on-line stores that have a centralize warehouse from where the product will be shipped to the customer, regardless of the country of origin and final delivery (Bask et al., 2010). In those examples, we found possible advantages of international cooperation, such as, cost reduction, strengthening relationships among both suppliers and customers, share of experience and expertise that can lead to opportunities of offering diversification and better allocation of resources.

In summary, in this chapter we introduced the concepts of architecture, modularity and platforms. We described how they emerged in the field of products and were transferred for service reality. We explored service modularity, as it occurs in services, processes and organization, and its implications for the overall firm's operations. In the end, we proposed a multinational perspective of implementing modularity. Besides the lack of literature in this global context, we argue that it is relevant to develop further

investigation, for example, through empirical studies. Furthermore, in a crisis scenario, as the one that affects today's economy, firms have to look outside its boundaries for new opportunities and diverse ways of operating. Modularity could thus represent a useful tool that would boost economic recovery whilst promoting international cooperation.

CHAPTER 4 – CONCLUSIONS AND IMPLICATIONS

Services are progressively being recognized for their importance within today's economy, due to globalization, economy's deregulation, and fierce competition. The current world crisis scenario combined with saturation of domestic markets, encouraged firms to expand its businesses to other countries. Thus, the purpose of this study was to investigate how firms develop new services at the multinational level.

Investigating both product and service literature, we found that services specific characteristics (e.g. intangibility, heterogeneity, simultaneity, perishability, inseparability, role of people, and the nature of services as both product and process) enable the independently study of services. Even though, we recognize that it is possible to transfer some insights from product literature to the service context, and we explored product-based literature every time it was possible while conducting this study. Moreover, service firms should take into consideration the specific situation they are dealing with, and identify if there is any similar situation in the product field in which they can get insights that could lead them to an answer, and transfer it to the service context; otherwise, they should start over and create an original service-based solution.

To understand what a new service is, we reviewed the literature on innovation. We argue that innovation is closely related with change, whether in something that already exists or in something totally new; also, there is a continuum from radical to incremental innovation, depending on the level of intensity of innovation. Thus, we defined a "new service" as a service that differs from a previous one, as a result of a change either incremental or radical. Nonetheless, innovation proved to be a complex field of research, with nonconsensual theories; and we found different authors proposing different definitions or classifications of innovation. We contend that assumptions of incremental innovation relate with the concepts of architecture and modularity that we also explored in this study. From specific service-based literature, we acknowledged that service innovation entails distinct functions of organizations and has a significant human involvement, from both employees and customers. Within service innovation, we identified four schools of thought with distinct

perspectives on the extent to which it is possible to transfer product-based theories and methods to the service field.

We investigated the literature on NSD to understand how firms develop new services; particularly, if firms use a formal systematic process that can be standardized among different NSD projects, or if they develop new services with distinct processes depending on the new service, or even if they don't use any NSD process at all. We found diverse NSD models proposed in the literature, but it was not clear the existence of one that could be generalized and applicable across different industries or countries. Also, we found that many firms still develop new services without a formal planning process, because existent frameworks are either product-base or too industry-related. Even though, firms should establish a systematic NSD process, encompassing distinct stages, interactive and non-sequential.

At the multinational level, we found differences among countries in terms of innovation, strategies, processes and managers attitudes. However, we did not find how new services are developed in two different countries, simultaneously, neither in terms of process standardization, nor process design. In this subject, product-based literature proposes NPD processes formalized, combining distinct stages in a linear way. In turn, service-based literature presents a classification of NSD models (partial, translational and comprehensive), demonstrates the importance of customer participation along process stages, and it highlights the nonlinearity and interactivity that NSD process should have.

We explored the field of service design, as service design is the outcome of NSD, to clarify the concept of standardization, and get insights that enable us to advance some hypotheses with regard to NSD at the multinational level. We found that firms adopt the concepts of architecture, modularity and platforms, to create an offering that can be, at the same time, unique, replicable, and consistent. Architecture refers to the infrastructure designed for a product or service, which can be integral or modular, depending on the degree of coupling among its interfaces and components. In the case of a loosely coupled architecture, components present a low degree of coupling; they are relatively independent of each other, enabling the separability, recombination and

substitution of components. Consequently, the architecture becomes more modular. Specific service literature enabled us to recognize that service architecture can be analyzed from four distinct levels: industry, service company/supply chain, service bundle and service package/component; and it also highlighted the importance of hierarchy design and technological discontinuities, when designing service architectures.

Modularity enables firms to break down its services and to develop small parts (modules) in a separated way; then, through multi-combinations of modules, firms offer a broad variety of different services. Thus, each module is independently created and has specific characteristics that in combination with other modules result in different final services. We also identified five important dimensions that determine the level of modularity present in architectures: interfaces, degree of coupling, components, commonality sharing and platform. We proposed a framework of analysis based on these dimensions. Particularly, from service-based literature we recognized that modularity occurs in firms' services, processes and organization. At the multinational level, we argue that modularity may represent a useful tool for companies that operate in two different countries, at the same time. However, we did not find either theoretical nor empirical studies that could suggest processes or frameworks that service firms could adopt.

At the multinational level, regarding our research question, we argue that it seems important that firms operating in two countries, at the same time, establish a formal NSD process, combining different stages, with non-linearity and customer participation. We suggest that modularity may help managers developing a unique, reliable and replicable offering, at a low cost. However, we are still not able to define how new services are developed in two different countries, simultaneously. We don't know, neither the extent to which a firm's NSD process may change when it is developed, simultaneously, in more than one country, nor how that process is designed (e.g. which stages are required? where do firms develop each stage?).

This study has limitations in terms of time constraints and resources availability and access. In regard to theoretical limitations, we had to restrict our data

selection, because we had limited time to develop the study and some papers that we found in the literature were impossible to access due to budget restrictions or database requirements of registration. Therefore, we decided to study only a selected group of papers, the ones that appear to be more relevant and more cited among researches. In terms of methodology, we conducted a content analysis. It would have been interesting to develop a practical application of our theoretical study. For instance, with an empirical study of a Portuguese company developing a NSD process in Portugal and other countries, where we could have investigated the process design and standardization or customization of process stages.

While developing this study, we found diverse gaps in the literature. In service innovation, further theoretical and empirical studies are required to clarify and develop a unique classification of new services. In the NSD process, additional empirical studies are necessary to define standard NSD processes and to validate the advantages of developing a formal NSD process. In service design, empirical studies are required to demonstrate modularity implementation and its advantages. Finally, at the multinational level, further empirical studies are necessary, to explore the NSD processes that firms can establish – clarify which stages to use and where and who should develop them; enabling an understanding of the development of multinational modularity.

Overall, this study is relevant because it provides an updated review of innovation, NSD and service design; and it also explores the multinational context of NSD process, which can be of value added for managers that desire to expand their businesses overseas or strike the actual crisis scenario. This study also provides important insights regarding recent practices in the field of service design that can be further explored by managers. Moreover, this investigation identifies possible future research opportunities in service management field.

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