

# Role of innovation in business growth



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In the flourish of the service sector, innovation have develop determinant role as the driver of growth. Increase performance in the innovation process is crucial to respond to the new challenges and gain competitive advantage to develop more services and generate more variety in the response to customer's needs. Technology can assist the service sector and play a more active role in facing this challenge, by supporting and reinforce of the weak points in the innovation process. This fact is capturing every day more attention of the academia and makes more relevant the need of study the relation between services, technology and innovation.

This document makes a general review of the existing literature and resumes the more important aspects to be considered in relation to the role of the technology in service innovation.

## **Service Sector**

### **Services and the Service Sector**

There are several definitions for services, (Alter, 2008, pp. 63-64), and it seems there is no consensus in a particular definition. In this document is adopted the definition propose by Alter in his work, which came originally from a dictionary. This definition refers to services as:

Services are acts performed for others including the provision of resources that others will use.

This definition allows to show one of the characteristics of services, the heterogeneously of the activities and business that they compromise. Those activities or industries include wholesale trade, retail trade, transportation and warehousing, information and cultural industries, finance, insurance and

real estate, professional, scientific and technical services, administrative and waste management services, educational services, health care and social assistance, arts, entertainment and recreation, accommodation and food services and other services. Each one of these services can comprise several kinds of business. For example, transportation involves rail, air, land and sea transportation businesses.

The service sector is a group of different and diverse industries. Each country used a classification system that allows identifying the economy activities, and services as economic activities are comprise in this classification.

NACE[1], ISIC[2]and NAICS[3]are the most common international standards used by the developed countries to classify the different economic activities.

(OECD: Organization for economics, co-operation and development, 2007, p. 14). NACE Rev. 2[4]for example, classifies these activities into 21 main sections, and only 4 of the sections correspond to manufacture activities, the remaining sections represent services activities.

### **Importance of the service sector in economy dynamic**

The classical theories do not explain adequately the role and the relevance of services in the modern economy (Miles & Boden, 2000, p. 5). Historically the services phenomena have been explained by two different theories, the de-industrialization and the post-industrial society theory. The de-industrialization theory view services as parasitic or non-value added activities, while post-industrial theory suggests that services isolated from the other sectors in the economy and are a result of a shift in the consumer demand. However, both theories neglect the importance of the sector positioning it merely as labor intensive, low capital and low-technology

activities (Preil, 2000). This thesis pretends in some extent to provide evidence to support the idea that those theories stayed in the past and countering the transformation of the economy.

Services have a new role in the economy, particularly in develop economies. In recent years, in the western countries and some of the Eastern European countries, who traditionally were industrialized economies, services are transforming the economy's composition; due to the rapid grow of the sector. In these countries, the sector surpasses and doublets the manufacture sector contribution to the economy, services accounts for more than 70% of the GDP (World Bank national accounts data, and OECD National Accounts data files). However, this behavior vary in extent between develop economies because of the differences in several interrelated factors, like services policy conditions, markets dynamics, climate for risk taking, venture capital supply and regulation barriers (OECD, 2000, p. 4).

Figure Service Value added from 1970 to 2008 (% of GDP)

Source: Adapted from The World Bank

Figure Service Value added in some developed Countries from 1970-2009 (% of GDP)

Source: Adapted from The World Bank

The rise of the service sector is also affecting employment and the labor market. Services are surpassing the manufacturing industry and producing a shift in the distribution of employment and patterns in the division of labor. In the develop countries, three quarters of the labor force is employed in the

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service sector. The absorption of employees into the service sector, from the manufacture and the agriculture sectors (Preißl, 2000, p. 66), and the recent incorporation of women to the labor force, may influence the increased employment in services (). Some of this new labor force is low skilled while other is mainly high skilled. However, skills are becoming more important in the service firms, especially technical and client skills, considering the need of the contact with the client.

Services productivity is less than in the manufacture sector (Preißl, 2000, pp. 67-68). Services employ more people than manufacture and services share in GDP is less than in employment. Therefore, each employ produce less output than in the manufacture sector. Services share in employment and GDP also differ between countries due to the differences in the jobs market composition. Part time jobs are more widespread in the service sector and in particular countries. However, on average output per person increase faster in the manufacture sector than in services.

Finally, services add value to the manufacture sector through the service activities (Howells, 2001, pp. 60-67). In order to satisfy demand more effective, focusing on customers need, manufacture sector is changing hoe they address customers, and including services related to their products in the offering. This is also visible in the way the brands are creating experiences and emotional connections with their clients through services, in order to sell their products and create differentiation. Lego for example through Legoland, which is the center of their experience strategy, provide a strong focal point for their products and brand (Voss, 2004, pp. 5-6).

Additionally, services have being always present in the manufacture sector

supporting their activities, for example with the delivery, storage and transportation services. As a result services allow the manufacture sector to establish a long term relationship with their clients, and add value to their offering, which enrich the economy dynamic.

Despite the importance of the service sector in the economy, services still without recognition. Moreover, to increase performance and to boost further expansion of the service sector is required to liberalize international trade and investment, strengthen service innovation regulation and reorient government programs to meet the needs of services more effectively (OECD, 2000, p. 30).

### **Services peculiarities and nature**

Despite the heterogeneity of the service activities, within the services is possible to identify some common variables or characteristics (Tidd & Bessant, 2009, p. 427), like quality and performance perception, product intangibility, simultaneity in production and consumption, need of interaction with customers, customization, regulation and difficulty to storage. These characteristics represent the fundamental differences between services and manufacturing. Additional differences can be derivate from these attributes, like technology orientation, innovation cycles and technology impact in employment productivity among others.

Services characteristics can vary between services activities. Services attributes differ on intensity or level in each service, depending on its nature, aims and situation. For example, the food service activity comprises two trends, self-service and service letter. Self-service aims for cost efficiency

and low cost, while service letter pretends to bring to the customer an add value service through the customization and high standards. Both services differ in the intensity in quality perception, customization and interaction with the customer.

Over time services and their characteristics are not static, change is a constant. The characteristics of a service and its extent within an industry can change, because of the market dynamics and the adoption of new technological innovations. For example in the bank industry, customers needed to consume services without moving from their places. As a result, banks adopted new technologies and today they provide to their customers with most of the services through internet and mobiles. In the bank industry, the place where the service is produced is not anymore the same place where it is consumed and the face to face interaction with customers each day is less needed. This transformation is taking place in all services industries; almost any service stays the same as we know it years ago.

Services are not exclusive for the service sector. The manufacture sector is generating a series of service activities to complement their offering, like financial services and insurance services (Howells, 2001, p. 61). In the technology companies for example, one half of revenue came from services (Wood, 2007) like maintenance and technical support, extended warranty, training and business consulting. Another practice used is the encapsulation of the product with a service (Howells, 2001), like Rolls Royce with their aerospace engine. Instead of selling the engine or a fix price, the company offer hours of flight. As a consequence, the manufacture share in turnover accounted for service sells is increasing, and services are adding more value

to the manufacture firms (OECD, 2000, p. 9)(Quinn, Doorley, & Paquette, 1990, p. 79).

The line between both sectors, manufacture and services, is being dissolved because of the overlap of their characteristics. (Barras, 1986) (OECD, 2000, p. 7) Manufacture sector is competing through services and in some cases services are adopting characteristics traditionally associated with products. In the entertainment industry, movies and other performance can be recorder and mass produced for further consumption, which is a characteristic from products. Furthermore, the movies are boxed and exhibited in the store's shelves like any other manufactured product. Services are permeating the whole economy and each time is more difficult to distinguish if a company belongs to the service sector or to the manufacture sector.

## **Types of services**

Sunbdo (2000) classified services in four different and not exclusive types or categories. The first type is called producer services and consumer services. Some examples of this type of services are household services such as cleaning, gardening, security services and financial services. A second type of services includes Knowledge intensive services like transportation and social and health care. This type includes also manual services, like catering and tourism. The next type of services comprises mass services and individual services. Examples of mass services are banks and cleaning companies, while individual services, which are more customized to the needs of each customer, are consultancy and care service.



Finally, the last type of services involves technology intensive services and technology extensive services. Technology intensive services include Information and communication technologies (ICT) intensive services like software firms and banks, as well as services intensive in other technologies. This is the case of transportation technology and medical technology. Education, care services for elderly people and house repair are examples of technology extensive services, which are more craft oriented work, use less advance technology and non standardized methods.

## **Innovation in services**

### **Innovation**

#### **In broad sense innovation is ...**

Innovation is an important factor in economy dynamics. Moreover, innovation is considered the driver of the economy growth in the recent years. This factor allows the firms to induce knowledge, technological capabilities and experience to generate variety and novelty in their offering and the way they deliver those offers. In this sense, firms need to invest and find innovative solutions to their client's needs, in order to be able to compete and be successful.

Innovation is not an isolated process (Coombs & Matcalfe, 1998, p. 11).

Innovation capabilities are everyday less allocated within a single firm and increasingly distributed across a range of firms and other knowledge generating institutions.. Therefore, Bi-lateral and Multi-lateral cooperation between manufacturer and service firms is more frequently reached within the innovation process. Usually these efforts are also turn into collaboration

with public research establishments or to involve the end user. According to Howells (Howells & Tether, 2004, p. 26) a Substantial rate of innovation comes from co-operative efforts.

## **Innovation in services**

Research on services reveals different approaches on innovation, assimilation approach, demarcation approach and synthesis approach (Coombs & Miles, 2000). The assimilation approach, treated service similar than products while the demarcation approach, which the approach in this thesis, argue that services and products are different; therefore theory that explain innovation in the manufacture sector is not applicable to the service sector. Finally, the synthesis approach suggests that services innovation brings elements of innovation that are of relevance for manufacturing as well as services.

Innovation takes place in services in a different form from the manufacture sector. Despite the concept of innovation in manufacture has been study extensively, while service innovation is a relatively new topic for academics, experiences in the manufacture sector cannot be fully applied to the innovation process in services. Both sectors differ especially in technology and knowledge development, considering the particularity of the service sector (Boden & Miles, 2000, pp. 252-253). The differences between both sectors lie in the technology trajectory, process of knowledge creation and acquisition, impact of technology and the innovation process itself.

In this sense, one innovation may facilitate another (OECD, 1997)

Innovation in services is often more integrated than in the manufacture sector (Sunbdo, 2000, p. 112). Sectors vary in the preponderance of product and process innovation (Pavitt, 1984, p. 353). The simultaneity of production and consumption characterized in services provide more integration between the production process and the product, in time and function, than manufacturing. Therefore, innovation taking place in service inherit this characteristic and each innovation often involve several types of innovation (Sunbdo, 1992), where process innovation has more emphasis. However, in some cases services can be more innovative in product innovations than the manufacturing sector.

### **Barriers to innovation in services**

Innovation conceptualization and process innovation in services remains dictated by the manufacturing-base paradigm (Gallouj & Weinstein, 1997). According to this theory, the service sector is a facilitator, mediator and repository of the manufacture innovations (Miles, 1993, p. 661). In other words, services firms provide few technological innovations their own, and mostly adopt and benefit from the manufacturing sector innovations. As a consequence, services remain preconceived with low innovative capacity.

Surveys reinforce the preconceive idea that position services with a passive role in the innovation system. Surveys based on traditional indicators, shows lower innovation and R&D in service sector, on average, than in manufacturing. The traditional indicators used to measure innovation like expenditure on R&D and corporate patents granted, aren't aligned with new context of services. These innovation's indicators don't consider the particularities of services, which not always meet the criteria for patents.

Additionally innovation in services can take unusual forms, and it is not limited to the R&D departments, making difficult to identify and quantify the expenditure on R&D.

Measuring innovation in the services sector is a challenge, there are several attempts but no apparent consensus in a method. The intangible nature of the products in the service sector, make innovation measurement excessively subjective. Furthermore, innovation varies in extent, forms and sources between services fields (Pavitt, 1984, p. 353). Additionally, differences within the sectors across countries (Pilat & Lee, 2001, p. 9) and the fact that innovation occurs throughout the organization process (Gallerher, Link, & Petrusa, 2006, p. 12) made more complex to measure the innovative efforts in the sector.

There is a need of new policies to cover services within the national and international innovation systems. May be due to the relatively novelty of services and the speed of the technological change, there is an incipient developed regulatory structure in the sector (Howells, 2001, p. 71). Lack of appropriated indicators to measure innovation, the low perception of innovation in the service sector and the des-harmonization between the national innovation systems, are examples that highlight the need of new policies that fulfill appropriately innovation and services phenomena.

The service sector lags of skilled employees. The services sector have growth fast, particularly the high skilled industries, as a consequence these industries are demanding more employment and are increasing the recruitment of more skilled workforce (Howells, 2001, p. 67). For the services

industry recruiting and retaining this personal a reason for apprehension, considering that a study completed by Howells and Tether (Howells & Tether, 2004, p. 71), skilled workforce is the third factor of success in the service firms after quality service and individual customer needs. If the trend continues, to sustain such high rates of growth in the future can become a major problem. This situation is challenging the whole system, specially the education system, which is the responsible for supporting that demand of skilled workforce.

Howells and Tether (2004, p. 113) mention in their work other important aspects that hamper innovation in the services sector. These aspects comprise economic risk, organizational rigidities, lack of technical information, lack of market information, direct costs of innovation and lack of customer responsiveness. These difficulties vary in extent between companies, according to the innovation intensity practiced. Howells and Tether (2004, p. 113) research found that those service firms that committed more resources to innovation, tended to experienced more difficulties.

## **Types of services innovation**

### **Innovation and target susceptible to change**

Innovation is related with change and it can take several forms. Considering the target susceptible to change, innovation can be classify in four forms (Francis & Bessant, 2005, pp. 172-180). The introduction by ICA of a new supermarket format, is consider a product innovation, because it is affecting organizations offering, either product or service. A change in the algorithm used in a warehouse to select and package the products to be distributed into the different stores is called process innovation, it is changing the way

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the offering is delivered or created. Innovation positioning takes form changing the context in which the offering is introduced, and most cases of this innovation relate with firms, brands or products, changing their target market or creating a new one. Finally, paradigm innovation occurs when the change takes place in the mental model which frames what the organization does. Paradigm innovation in turn can be categorized into two types of innovations, inner-directed paradigms and outer-directed paradigms (business models) innovation.

### **Innovation and the degree of novelty in the service**

According to the extent of novelty involve in the change, the innovation in the service can be radical or incremental (Freeman & Perez, 1988, pp. 45-47). Incremental innovation occurs more or less continuously, and this innovation comes from suggest inventions and improvements made by the individuals involve directly in the production process or as a result of initiatives and proposal from users. These innovations improve specific attributes by substitution or addition of characteristics, without modifying the structure of the target or system (Gallouj F. , 2000, p. 139).

Mean while, radical innovations are discontinuous events, which result from a deliberated research process. This research process can take place in the firms, universities or governmental entities, and the result is a totally new product with different characteristics and competences from the old product. Insurance companies of care and assistance products for example, are seen as radical innovators that has created a new system (Gallouj F. , 2000, p. 139). These companies are not any more offering life insurance, saving or damage insurance products, instead are providing services.

A further proposal done by Gallouj (2000, pp. 139-143) added other forms of innovation in services to the initial classification. This proposal includes 3 additional types of innovation: Ad hoc innovation, re-combinative innovation and formalization innovation. Ad hoc innovation refers to the interactive development of a solution to a determinate problem or request submitted by a specific customer. In this type of innovation the knowledge and experience accumulate over time work in cooperation, in order to produce a fresh solution and new knowledge that position the customer's problem in a positive an original way.

Re-combinative innovations (Foray, 1993) or architectural innovation (Henderson & Clark, 1990) refers to the possibilities introduced by new fusions of several final and technical attributes from existing knowledge and technological base. Bressand and Nicolaidis (1988) highlighted two other possible forms of re-combinative innovation. These innovations involve creating a new product by combining the attributes of two or more existing products or splitting up characteristics from products and turning them in autonomous products.

The third type innovation introduced by Gallouj (2000) is called formalization innovation. In formalization it is not quality or quantity that change, instead the visibility and the extent of standardization of the attributes. The organization of work in McDonald's is an example of formalization innovation and it consists of putting in order the service characteristics, whether tangible or intangible.

## **Technology and service innovation**

### **Technology trajectories**

#### **Technology and services innovation**

Contrary to the manufacture sector, service innovations are not traditionally strongly associated with technology. However, services sector is the main buyer and user of information technologies in developed economies (Kustscher & Mark, 1983).

Technology is not enough to explain the innovation phenomenon in service companies (Sundbo, 1997). There is a non-technology component that also accounts for the innovation process in the services firms. Most service innovations are non-technological and mostly involve small and incremental changes in process and procedures. According to Sundbo's (1997) work,

Service companies do not focus on providing with new technologies their customer's baskets, rather technology innovations are related to the service production, not to service innovation process itself. For example, in knowledge intensive business services (KIBS), which are the more innovative organizations among the service sector and responsible for innovativeness in other firms (Nählinder, 2005, p. 181), information and communication technologies CIT are changing their production process and in some cases their delivery process also.

#### **Technology adoption in the service sector**

As a first stage, services firms adopt technology to improve actual process efficiency in the services provided while decrease costs. After gaining improved quality and delivery in these services through radical innovation,



the technology provides the basis for a complete new service. This innovation process in services is called “ reverse product cycle” (Barras, 1986) and is specific of the service sector.

Productivity is the ratio of output to inputs for a firm. Several studies have been done and this situation leads the framework to the “ productivity paradox” (Attewell, 1994, p. 24), where it is expected that investment on IT over time will be reflected in improvements in profitability or productivity. But it is proved that technological leadership is not enough to be profitable. Technology itself don´t provide economic benefits to the firms. The capacity of the firm to adapt to technology and its benefits depends on their capacity to translate those benefits into product and process and to defend them against imitators.

### **Other relations between technology and services**

The relation between technology and services is not limited by the impact of technology adoption by services industries, other relations can be distinguished (Gallouj & Gallouj, 2000, pp. 25-26). A substitution relation for example, is when substituting technical capital for human capital in the back office. Automated teller machines and other technologies which support the self-service are examples of substitution relation (Gershuny, 1978). Identity relation is when the characteristics of the service provided influence the value of the technology. This is the case of telecommunication services with electronic mailing, fax and high definition video.

Determination relation is other type of relation between technology and services. In this type of relation, technological innovations are the origin of

the new service function. Information technology is an example, which gave rise to new professions and services. The fourth type of relation is diffusion relations, characteristic of high technology consultancy firms, where services assist to disseminate technological and organizational innovation (Moulaert, Martinelli, & Djellal, 1990). Finally production relation is when service firms become technology producers directly or indirectly through pressure or persuade other producers.

### **Sectoral taxonomy and innovation technology source**

Soete and Mizzo (1990) developed a taxonomy specific for services, based on a previous taxonomy derivate from Pavitt's proposal. In their work Soete and Mizzo suggest three types of services firms grounded on the sources of technological innovations, user needs and appropriating benefits. This taxonomy is in line with the analysis proposed in this thesis because the basis of analysis is the innovative firm and the technological component, which are the objects of study in the present document. However the taxonomy lack of consideration in the non-technological component of innovation (Gallouj & Gallouj, 2000, p. 30), but it still being relevant for the purpose of the study present in this document.

Supplier dominated is the first of the three types of services firms (Soete & Miozzo, 1990). In this type of service firm, the source of innovation is dominated by suppliers of equipment and technical systems. Supplier dominated firms do not participate in the development of the technologies they use. These services firms can be classified under two subcategories: personal services and public and social services. Personal services, like food and hospitality, generally respond to small firms where users are sensitive to

performance. The second type, public and social services, correspond to education, health care and public administration. Generally, this last type of supplier dominated firm is associated with large firms, where users are sensitive to quality and technology appropriation is not allowed or is public.

The other two types of service firms are “ physical and information networks” and “ specialized supplier and science based firms”. These services firms are more involve in the development of the technology they used. Network firms take advantage of technology to reduce cost and support their networking strategy, users are price sensitive, the firm size is large and technology appropriation is by standards and norms. These firms can be associated with physical networks, like transport and wholesale distribution, or with information networks, like finance, insurance and communications. The sources of technology in network firms are in-house through engineering and production departments or suppliers of equipment and technical systems.

The third type of service firms is specialized supplier and science based firms. This type of firms has an important output of technological innovations. This technological innovation are researched and developed in-house, the user is performance sensitive and the firm size generally is relatively small. Technologies are adopted mainly based on the system design and appropriating of this technology is through copyright, product differentiation and know-how.

## **Knowledge Information Business Services and ICT**

“ Knowledge is the main driver of today’s global economy,” said OECD Secretary-General Angel Gurría at the launch of the OECD Innovation Strategy in Paris.

### **KIBS role in the innovation system**

#### **ICT**

##### **Concept**

**Has become widespread is a recent phenomena, especially in the area of knowledge services (miles)**

##### **Role**

The role of ICT is different for different types of innovation (Dencik & Djarova, 2009, p. 122) ICT itself is only a minor facilitator of innovation; it becomes powerful only in combination with a number of other complementary factors.

### **Discussion and Conclusion**