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SENAI Design Futures: An Innovation in Services

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Resumo

O artigo objetiva apresentar o caso de sucesso em inovação em serviços promovido pelo projeto SENAI *Design Futures*. Trata-se de um projeto internacional, desenvolvido pelo *Consorzio Del Politecnico di Milano* (POLI.Design), de Milão, Itália, e pelo Serviço Nacional de Aprendizagem Industrial (SENAI), Brasil. O estudo baseia-se na premissa de que a transferência de tecnologia internacional impacta positivamente o processo de inovação. Considerando que ainda existe um vasto campo para estudos que descrevam as relações entre inovação em serviços e internacionalização, o artigo pretende vincular as abordagens teóricas de ambas as áreas, usando o estudo de caso como evidência. As conclusões mostram que esta abordagem pode ser benéfica para as instituições na promoção da inovação em serviços.

Palavras-chave: inovação; inovação em serviços; transferência de tecnologia; internacionalização.

Abstract

This article aims to present the successful case of innovation in services promoted by the Project: SENAI Design Futures, an international project, developed by *Consorzio Del Politecnico di Milano* (POLI.Design), from Milan, Italy and the National Service for Vocational Training (SENAI), in Brazil. It is based on the assumption that international technology transfer has a positive impact on the innovation process. Considering there is still room for more studies describing the relationship between innovation in services and internationalization, this article intends to link the theoretical approaches from both areas, using a case study as evidence. The conclusions show that this approach can be beneficial for institutions to promote innovation in services.

Key words: innovation; services innovation; technology transfer; internationalization.

Introduction

This study had the objective to analyse innovation as an impact of technology transfer and internationalization activities. The central hypothesis is based on the assumption that neither technology nor organisation are fixed elements, and are conducted also by different factors. Innovation, as any other result, has several determinant factors. Therefore, the idea was the analysis on innovation in services, or the knowledge transfer generated from an interactive process (Slappendel, 1996).

Internationalization is a strategic decision for a company and it implies constant effort and resource allocation, over time, to be successful. So does innovation as a competitive process. Academics are trying to understand and model the relation between the two of then, but few examples are the objects of empirical study yet (Castro, 2011). A study conducted recently by the authors organised a systematic survey of scientific publications issued between 2005 and 2011 simultaneously dealing with service innovation and service internationalisation, revealing a scientific gap and still a field for further exploration. Among several studies published in both fields (internationalization and innovation) less then ten tried to study the relation among them. Thus, the objective of this article is to analyse and connect theoretical approaches that could help to better understand how the processes feed each other. More specifically, the authors have studied an international technology transfer project, in this article understood as part of an internationalization process, to verify the impacts on organizational innovation.

Through the revision of internationalization theories, linked with the definition of the technology transfer process, this article aims to investigate some of the processes throughout internationalization. Using the integrated approach for innovation in services, it also seeks to summarize some indicators to understand the relationship and impact of technology transfer on innovation. The indicators developed by Gallouj (2002) and later used by Castro (2011), can demonstrate evidence of innovation in services, and were adapted to be used in this case study. The indicators are tested through empirical evidence, reports and interviews.

Theoretical and Conceptual Aspects of Internationalization and Innovation in Services

Understanding the internationalization process requires taking into account diverse perspectives. Some papers on the internationalization of enterprises (Hilal & Hemais, 2003) underlined that this phenomenon can be studied under the behavioural approach, in addition to the economic approach. The internationalized organisation has also been characterized by a cumulative process of learning, with a complex structure of resources, skills and influences (Hilal & Hemais, 2003).

One approach, the Uppsala model, focuses on the acquisition, integration and gradual use of knowledge in operations and international markets, leading to a growing involvement in the operations within these markets (Eriksson, Johanson, Majkgard, & Sharma, 1997; Johanson & Vahlne, 1977, 1990). The Swedish scholars, Johanson and Vahlne (1977) started by empirical research about Swedish firms competing internationally. The theoretical base of the U-model can be found in the behavioral theory of the firm. In the model, internationalization is seen as a process in which the enterprise gradually increases its international involvement. Another behavioural theory is the one on relationship networks, regarded as an evolution of the U-Model (Hilal & Hemais, 2003), which strengthens the study of internal and external relationships of companies abroad. The company chooses its entry mode and evolution in the external market in accordance with the performance of the network in which it is inserted. Relationships abroad affect the market choice where a company will operate and its way of action (Andersson & Johanson, 1997). Therefore, the process of internationalization would be directly related to the experience and the accumulation of knowledge abroad, and also to the performance of actors in the network.

Another subject of the theory is psychic distance. It is known that the perceptions can affect the market selection process, at the individual decision level, because managers influence strategic decisions about a company's internationalization.

The strategic decision to become international comes with the necessity of survival in a competitive world. And for companies, going abroad means starting a learning process in order to catch up with international quality and technological levels. Therefore, in order to remain socio-economically active, organisations are constantly compelled to change their technologies, practices, processes and products. And they will do so to keep up with current standard (and very flexible) behaviours and expectations, which depend on the values generated internally.

In other words, while considering the current economic momentum, Sbragia, Stal, Campanário and Andreassi (2006, p. 39) discuss that "high competitiveness, product quality and fierce competition, make business success increasingly dependent on the company's ability to innovate technologically, introducing new products on the market, at a lower price, with a better quality and higher speed than its competitors".

Based on Schumpeter's (1988, p. 28) view that "social facts are the result, at least immediately, of human behaviour, and the economic facts are the result of economic behaviour" or yet, a behaviour for the acquisition of goods, Freeman and Soete (2008) will explain further this context arguing that, more than to just generate wealth, innovations are important because "they allow people to do things that had never been previously done" (p. 19) and thus impact economic actions inside or outside their country.

Technology transfer in developing countries has been much discussed in the framework of international economic relations in the last thirty years. Technology is a critical factor for well-being and economic development, and is defined by United Nations Conference on Trade and Development (UNCTAD) as "systematic knowledge for the manufacture of a product, for the application of a process or for the supply of a service" (UNCTAD, 2001, p. 5).

Therefore, it should be emphasized that it is the knowledge embedded in the creation of a product and provision of a service that constitutes the technology, and not necessarily the product and/or service itself. Knowledge encompasses not only the technical know-how for the production of the final product or service, but also the organizational capacity to convert relevant productive inputs into a final output. It is crucial, for any country, regardless of its level of development, to have the collective capabilities for the acquisition, absorption, adaptation, diffusion and adoption of existing knowledge and the ability to produce and use new knowledge (United Nations, 2012). Technology transfer is, consequently, part of the process of continuous development and, in an international context, usually present in the relationship between companies, and especially between multinational companies and their subsidiaries (UNCTAD, 2012).

The transfer of knowledge can take two forms (Oliveira & Segatto, 2009). It may take place internally, when the evolution of a technology occurs in the same organization, generally creating or improving existing processes and practices. On the other hand, this transfer also happens externally with movements into or out of other organizations, including acquisitions of technologies from external sources, or licensing technologies, as well as corporate alliances at various levels, including cooperative development, industrial consortia agreements, mergers, among others arrangements.

In addition to any other elements, technology transfer can also be analysed from two perspectives of events and learning, where the first considers the economic transaction carried out with the aim of obtaining profit through the commercialization of technology, while the second, as a process in which learning occurs. According to Malik (2004), technology transfer is a process of promoting technical innovation, through which, companies, transfer ideas, knowledge, artefacts and objects.

In the case of this study, the technology transfer will be considered in the context of the external process, here understood as an aspect of international technical cooperation, an instrument used

internationally to generate knowledge flow to a local organization from a provider organization, promoting the institutional development of the new technologies absorbed (Oliveira & Segatto, 2009).

In the case of service companies, the knowledge creation and flow is the basis to enhance product value and, for Kon (2004, p. 8) "it will add value to the global process of productrion and accumulation". For Barras (1986), services innovation also predicts that opportunities are necessities identified and solved as a result of use and exploration of new technologies. He also describes adaptability as the way that human and technical aspects can impact the introduction of new technologies. Barras describes how technologies can generate incremental changes, and in a latter phase, these same technologies can generate higher quality in services, increase effectiveness and reduce costs. In a mature level, they will be able to support new services, and exploration of new markets. Following this line, Gallouj (2002) develops the formalization of innovation, in other words, innovation as a result of new methods, a design or new tools and instruments that contribute to formalize new behavior. Using this services innovation concept based on competences, products, processes in the organization, as well as the firm's external relations, with suppliers and the firms' systems and structures allowed this study to organise the technology transfer process and analyse its impact for innovation at the levels of the organization, the service itself and the market.

In the case described hereafter, the Brazilian National Service for Vocational Training (SENAI) established a partnership with a design-based firm owned by the Consorzio del Politecnico di Milano (POLI.design), in order to develop the SENAI Design Futures Project, with a view to promote innovation in design by Brazilian industrial companies.

SENAI and International Partners

The National Service for Vocational Training (SENAI) is a now private, non-profit organization created by the Brazilian government 70 years ago with the purpose of supplying skilled labour for Brazilian Industry. Today it not only provides training, but also innovation and the transfer of industrial technology, in order to increase industrial competitiveness, as well as contribute to the country's social and economic development (SENAI, n.d.).

Over the years, SENAI expanded its support to Brazilian companies, including a number of technical and technological consultancy services. Under the methodological and technological aspects, the institution constant updates and renews its portfolio (SENAI, n.d.).

In order to support its programs and promote institutional strengthening, SENAI looks for international partners. It is possible to affirm that the excellence of the services provided by SENAI, in large part, is a result of an important updating promoted by a solid network of international partnerships with more than 40 countries.

Therefore, SENAI's international agenda combines basic elements for knowledge transfer, absorbing this knowledge and re-transmitting it to local companies. Hence, SENAI can be considered an important promoter of Brazilian foreign policy development through international technical cooperation processes. Technical cooperation is performed between institutions through international projects. SENAI acquired, tested and developed a consolidated methodology of prospecting, negotiating, designing and implementing projects that has been improved over the years (SENAI, 2010a).

In today's competitive global scenario, the institution's international activities are moving towards a new paradigm: the context of technical cooperation, from the exchange of experiences and content, is moving to the generation of new products Research and Development (R&D) in co-creation with global, top-ranked institutions. Current international projects are being shaped under a new process for the joint construction of new products and services. In order to bring new knowledge to the production system and to accompany the current process of growth and transformation in the Brazilian

industry, SENAI entered this project to rapidly develop the skills necessary in the Design Management field. “From the Brazilian point of view, it meant to bring the nation’s growth potential into play, the expansion capacity of industry and the sensitivity and creativity inherent to the country’s culture, linking this with consolidated Italian expertise” (Politecnico di Milano, 2010, p. 140).

Considering the history of SENAI’s international projects, and its experiences in both the reception and transfer of technology and the belief that technology transfer is a way of promoting the country’s catch-up capabilities and the implementation of market and services innovation, this study aims to determine if there is a positive impact for SENAI in its performance through the incorporation of international technology. In this belief, the SENAI Design Futures Project was established, as presented below.

The SENAI Design Futures Project

SENAI established a partnership with the Institute POLI.Design of Milan, in the midst of a move to become able to promote design-driven innovation within Brazilian companies. This partnership resulted in the international cooperation project – SENAI Design Futures – which was characterized by a strong investment in the transfer of expertise in design, and the development and adaptation of such knowledge to various contexts involved in the project. One of the focuses of this partnership was to empower the transfer of design knowledge internally and externally, incorporating such inputs into the service offerings of SENAI’s Technology Centres. The project was developed between 2008 and 2011. POLI.Design is a consortium of the Politecnico di Milano and the Faculty of Design, constituting the Politecnico di Milano’s Design System. It is the world’s most relevant set of laboratories in industrial design. The project for the Design Network involved six Regional Departments (Bahia, Minas Gerais, Paraíba, Paraná, Rio Grande do Sul and Santa Catarina) and Technology Center for Textile and Chemical Industry (SENAI-CETIQT) (a unity located in Rio de Janeiro, consisting of a Technology Center for Chemical and Textile Industry) and was managed by the National Department. The Project SENAI Design Futures had the following goals: to spread the culture of strategic design within SENAI Units; to expand technical skills of SENAI in textile and clothing design, leather and design artefacts and furniture design; and to integrate SENAI into an international network of training centres, information and services in design.

The team was formed by 16 experts from POLI.Design, and team members from local SENAI departments. During a period of 30 months, this team provided support to the process of enabling the integration of the technological dimension of innovation and the strategic and managerial dimensions of design. Local companies were involved, on an average of 2 by region, and were empowered and trained to build their own work plan for the implementation of the actions foreseen in the project. The technicians were trained by Italian consultants during the activities with local companies, and the work plans to be developed with the company pilot were jointly designed by Brazilians and Italians, who aimed to comprehensively fulfill the innovation process based on the Strategic Design approach (SENAI, 2010b).

In addition to these actions, the following processes were incorporated: joint development of training products and consultancy; co-branding of developed jointly projects; transfer of design-oriented consulting models; integration and incentives for the development of new competencies. For Poli.Design, one of the peculiarities of the projects abroad, especially when transferring models from a mature context such as Italy, to other rapidly evolving contexts such as Brazil, has always been to reject ready-made recipes. On the contrary, it has always pursued the constant quest for shared solutions, the practice of continuous learning-by-doing, the adaptation of models and rules to the situation in which it is operating (Politecnico di Milano, 2010, p. 140). Despite the experience and cumulative knowledge in the implementation of international projects, and the extent of its international networking, the focus on innovation and the process of co-creation during the project posed some interesting difficulties for SENAI: the cultural distance, perceived beforehand to not be a

barrier (since there are many Italian immigrants in Brazil), demonstrated to have impacted the performance and the results, as well as the differences in expectations and absorption capabilities. The consequence was that very different results were achieved in this project in the different regions involved.

Methodology

Due to the nature of the research problem, and the objectives in view, we chose an analytical approach of qualitative descriptive type, as proposed by Creswell (2007). To achieve the objectives contemplated in this study, we adopted the case study methodology justified for examining contemporary events, when there is no control over happenings inserted in this same context (Yin, 1994).

A survey was held to produce primary data, for which the main resources were semi-structured interviews organized with the seven participant departments. They answered a structured web-based questionnaire and then further interviews were developed and transcribed. The data analysis allowed us to organise the interview results within the concepts developed in the above-mentioned theory.

The assembled information also allowed us to frame conclusions concerning the research object: is there a positive impact on (services) innovation performance as a result of the international technology transfer process? After the data analysis and correspondence with the indicators, we double checked the results through a second focused interview with local managers. The results and conclusions are described in the following session.

Results

Considering that internationalization and services innovation model presuppose three aspects: the opportunity, the usability and adaptability (Castro-Lucas, 2011), we used indicators of Service Innovation as developed by Gallouj (2002). The indicators received a valuation from 1 to 5, where 1 represents, nothing has changed with the project, and 5, a substantial change was achieved with the project. The matrix summarizes the two interviews held in each department (named A to F) and a third data collection with the Italian consultants. The resulted punctuation is a simple average of the three results:

Table 1

Questionaire Results

	Questions / SENAI Regional Unit Involved	A	B	C	D	E	F
1	Internal process were created to deliver the service	2.00	4.67	4.00	2.00	1.00	4.67
2	The way the service was delivered to the client	2.33	5.00	4.33	3.67	1.50	4.00

Continues

Table 1 (continued)

	Questions / SENAI Regional Unit Involved	A	B	C	D	E	F
3	The business model of the services	2.33	3.33	3.33	1.33	1.50	2.33
4	The legal framework of services (brand, specifications)	2.00	5.00	3.00	1.33	1.50	1.33
5	The technology used to provide the service	2.33	3.00	4.00	2.33	1.50	4.00
6	The main client profile targeted	1.33	3.33	2.00	1.33	1.50	2.67
7	The main services offered	3.00	3.33	3.67	2.67	1.50	2.33
8	The content of marginal associated services	3.33	4.33	3.33	1.33	1.50	1.33
9	R&D of the department or any other units in charge of changing process	3.33	4.00	4.00	0.33	1.50	3.00
10	Capacity to fully use the new technology	2.33	4.33	4.00	2.33	1.50	4.33
11	Capacity to communicate with the client	2.33	4.67	1.67	2.00	1.50	4.00
12	Capacity to communicate within the network	2.00	4.33	2.67	2.67	1.50	3.67

Note. Source: Developed by the Authors.

During the interviews, two other questions were asked in order to understand the perceived value of the international partner, as described below:

1. Was there a cultural change in the way participants understood design and innovation after the project?

2. Was there a value perception, by the final client, of the international content of the technology?

The cultural aspects and the project management also had an impact on the data obtained. The results achieved in the overall project were considered successful and overcame expectations.

> The activities dedicated to building shared values and language, were facilitated by the existence of underlying aspects common to both Brazilian and Italian cultures. Certain traits in the way the Brazilian universe feels and lives its surrounding are very similar to those of the Italians (Politecnico di Milano, 2010).

However, these results were not homogeneous in all participating units (results from A to F). One of the premises for the different degree of success refers to difficulties relating to the level of previous knowledge and resources for the generation of new products and the incorporation of new techniques. The challenge of integrating multicultural and multidisciplinary teams and the problems of network performance were also pointed as another relevant issue that delayed the activities and negatively impacted the sharing of information and knowledge transfer.

The results showed that there was a real impact for SENAI on its services as a consequence of the technology transfer project. As per official reports,

> two very delicate moments of transition characterized the procedure (co-design). A design culture had to be superimposed over an eminently technological mentality in the organization … it was therefore a question of making the organization as a whole understand the need to go beyond simply knowing how to do something and acquire the capacity to rethink the innovative process being introduced; to ask not only how to do something but also why we should do anything and what to do. It was necessary to trigger a profound cultural change in the organization without settling for a simple transfer of skills, and the ability to operate at the various levels of design (Politecnico di Milano, 2010, p. 24).

If one of the causes of differences in results was, remarkably, the absorption capabilities of the teams involved, the other was related to local market readiness to absorb the new technology. Where these two variables were positive, there was a fast and important change in the services delivered by the local SENAI. As described by SENAI's manager, "As a result of the project, we completely changed the targeted market and the process of co-developing the solution with the client. Then, with the right focus on the client company's type and size, we could increase our financial results more than 100%".

From the supplier side, the fact that the service was based on an Italian technology was highlighted changed the client value perception. "Whenever visiting a client company with the Italian consultant, we would be received by the owner or president himself. It wouldn't be the same if we were all Brazilians", mentioned one interviewed manager.

Conclusions

The development of the international SENAI Design Futures Project was a result of an identified demand to create singular services for the Brazilian industry. The project has been recognised by the degree of innovation promoted especially in the development of a concept around Strategic Design considered unique and differentiated. Some SENAI units proved to have developed new business models around design innovation. An innovation model that goes, too, for the joint use of the trademark of POLI.Design (co-branding); by setting up a knowledge-based network; by the development of courses and the permanent exchange between researchers of POLI.Design and SENAI. This continuous exchange provides for the development or participation in joint research projects and consulting projects for companies and organisations.

Technology transfer is part of the process of continuous development of knowledge in the international context as developed in the SENAI Design Futures Project. This project sought the involvement with internationalized activities related to the generation, development and acquisition of knowledge and technologies, generating positive impacts not only for the promoter (in this case, SENAI).

It seems that, when variables such as physic distance and knowledge can be managed, the results for innovation shows up as a positive alternative for a fast catch-up with global references. However, the experience of SENAI in previous international projects and in other international networks could have been a differential that leveraged its performance better than if compared to other' results, when international experience is not so extensive.

This research was able to conclude that the technology transfer process had a positive impact for the organisation, that has achieved, at least for the units where cross-cultural bridges were shortened, a better competitive position and an innovative value proposition in services related to design, which allowed SENAI to enter a new field of activity.

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