Collaborative Networks and sustainable business: a case study in the Brazilian System of Innovation

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Abstract

This paper presents a management model designed to articulate the different actors from Brazilian innovation ecosystem aligned to business strategy. This model was developed and is being validated by a Brazilian company called Natura, a consumer goods industry leader in the cosmetic sector in Brazil and that has operations in six other Latin American countries (Argentina, Bolivia, Chile, Colombia, Mexico and Peru), and France. Natura investments in innovation increased from US$ 44.07 million in 2008 to US$ 83.84 million in 2010.

The methodology of this study was inspired by good practice search, following the approach suggested by Slowinski and Sagal (2010). Also, it was based on previous company experience and its technology planning, activity that within the company aims to assess trends (consumption, market and technology), build product roadmaps, research and innovation programs, map and evaluate technical competences and its related gaps in order to achieve the innovation strategy. The collaborative networks and partnerships management model was designed to meet the innovation strategy by assessing competences in the external network of partners and by articulating universities, companies and governments in a single framework. This occurs through the integration of four processes that aim to form, to strengthen and connect innovation networks.

1. Introduction

One of the challenges of National Innovation Systems [1,2], especially in developing countries, is to promote integration among its actors (academia, businesses and governments). A key issue in this sense is to enable the...
transference of knowledge and technology between research institutions (RI) and companies fostering the technology diffusion process.

The countries scientific and technological development pathway has many determinants, such as the institutional framework, national policies for innovation and university-industry interactions in performing activities of Research and Development (R&D). These factors become even more critical for the process of technology transfer and diffusion involving companies seeking funding and implementing the activities of Research and Development.

The scientific and technological policies in Brazil have expanded their scope of activity in recent years and have undertaken significant efforts for the country to expand its participation in the global scenario in terms of Science, Technology and Innovation. An example of this is that one of the goals of the National Strategy for Science, Technology and Innovation is expanding the participation of national expenditure on R&D as percentage of Gross Domestic Product (GDP), which currently represents about 1% (the largest in Latin America) to 1.8% in 2014 [3].

In Brazil, R&D private expenditure is still relatively low compared to developed countries, so ENCTI (acronym for National Strategy for Science, Technology and Innovation, in Portuguese) has as the main goal to expand it to 0.9% (R&D/GDP). With this in mind, policies that foster innovation have advanced substantially in recent years, with the creation of more sophisticated instruments such as subsidies and the innovation tax incentive law.

Among the positive results of these governmental efforts in scientific and technological development of the country we can highlight the increase in participation in the world publications and growth in the number of publications and PhDs in recent years, as illustrated by the graphs below.

Figure 1. Brazilian SCIE-indexed publications, total and share of world output, 1981–2006 [4]

Figure 2. Number of PhDs in Brazil, 1987-2008 [5]
Brazil has achieved a quite expressive increase in the share of indexed world scientific publications. In 1981, Brazil's share was only 0.2% and in 2009 it represented 1.9% of world scientific publications indexed, which demonstrates competence in the generation of Brazilian scientific publications about relevant topics.

Another interesting indicator concerning Brazilian scientific and technological efforts is the growing number of doctors trained in the country. In 1987 there were about one thousand doctors per year, and in 2008 this number reached about eleven thousand doctors, representing an increase of nine times in the period.

However, most part of these PhDs remains working in academia, which indicates the weakness of university-industry interactions and the difficulties that they find to develop careers applying their knowledge in enterprises. Evidence of this is that 71% of doctors trained in Brazil were employed in education related activities in 2006 [5].

This reality is distinct from that observed in developed countries, where most of the doctors have an important role in the industry, which facilitates the processes of knowledge and technology transfer and diffusion, and the private sector often plays a leading role instead of the government as main R&D funder.

Another result that comes from this weak university-industry interaction is the low number of patents generated by Brazilian researchers compared to other countries with the same R&D effort, as illustrated in Figure 3 below. An example of this is that while China has expanded its sustained record of patents since 2000, Brazil remained the same level - extremely low - during the entire period.

The dynamics of interaction among National Innovation System actors (NIS) contributes importantly to overcome the challenges presented above. Increasingly, the structure of collaboration networks in science and technology, including government support in strategic areas of development for the country, represents a strategy for promoting greater integration of innovation players building "bridges" to substantially increase the transfer and application of knowledge, investment in R&D and absorption of highly qualified researchers in the companies. The objective of this paper is to present the acting model in innovation networks adopted by Natura Cosmetics, the largest Brazilian company in the Cosmetics and Fragrances and Toilets segment, illustrating the different dimensions of a company in a National Innovation System and evaluating results of the strategies adopted.

![Figure 3. Trend in USPTO patent applications, Brazil and selected comparison countries, 1985–2005](image)

**2. Advances in policies for funding and innovation in Brazil**

In recent years it is possible to notice an effort to develop mechanisms to strengthen the triple helix, particularly to promote culture and fostering innovation, as observed by the Brazilian legal framework.
The Innovation Act (Law No. 10.973/2004, regulated by Decree No. 5563 of October, 11th 2005) was an important milestone in the evolution of instruments for promoting and encouraging innovation and the realization of scientific and technological partnerships among different actors in Brazil. Among the changes introduced by the law we can highlight: possibility to incubate companies within Institutions of Science and Technology (IST); usage of IST infrastructure by companies; establishing the creation of offices to facilitate patent licensing and transfer of IST technologies to companies; participation of researchers in revenues from technology licensing and setting specific instruments to promote innovation [6].

It is possible to note a significant advance in the creation of more sophisticated tools for political support and R&D funding for improving R&D in companies. Among them we can highlight the Tax Incentives Law (“Lei do Bem”) and Subsidies. This Law permits the granting of tax incentives to companies that perform R&D, such as reduced corporate income tax depending on how much a company invest in R&D and Innovation. It is also possible to note the consolidation of subsidies as grant resources that go directly to companies. This tool is managed by the main federal agency for innovation funding - the Financier of Studies and Projects (FINEP, acronym in Portuguese), and has launched significant results for the improvement of knowledge and technology in the Brazilian National System of Innovation.

However, it is necessary to advance on several issues, as the recognition by firms that integration with government and Research Institutions (RI) is critical to country scientific and technological development and sustainable growth. The main consequence of this scenario is the weak integration noticed between RI and companies as well as the reduced use of public funding by innovative activities of the industry in Brazil. This paper focuses on this issue and contributes by presenting the mechanisms created by a Brazilian company to interact with RI and remain aligned with policies which encourage innovation in Brazil.

3. New trends in open innovation and networks

The concept of open innovation expands the possibilities, promoting innovation through relationships with external actors to acquire, sell, co-develop and other forms of interaction. This model contradicts the closed model of innovation, according to which companies should invest in large R & D laboratories focusing to develop their own technologies. The emphasis on open innovation is the growing importance of knowledge and opportunities within and out the company to internalize opportunities through partnerships [8].

In the U.S., the annual growth of 18% of the pharmaceutical industry is widely linked to the formation of networks for research and product development. In the field of computers, the use of networks and clustering promoted a rejuvenation of American industry in the 80s. For the Italian furniture industry, international competitiveness is ensured by constant differentiation in products, achieved through the articulation of small family firms [9].

Other interesting study case is the Deutsche Telecom, a German telecommunication company which shows the fostering open innovation ecosystems and the interface with their laboratories (T-Labs). Rohrbeck et al [10] identified 4 categories of a total of 11 instruments that follow the innovation process stages in the company. All these initiatives are adopted in different efforts and intensities inside the company, as the figure below shows.
In the various stages of product development, the company used to generate practical ideas, collaborative research and engagement activities of the partners and customers network to create new products and new services. Furthermore, outside-in and inside-out processes, and the combination of both were also used to build an ecosystem of open innovation that worked collaboratively to leverage capabilities, open innovation through a well-founded strategy and construction of instruments and tools to promote and disseminate innovation networks.

The Procter & Gamble’s (P&G) initiative, “Connect and Develop”, has been very popular and there are many reports and interviews about these practices. The R&D organization of company has over 6,500 scientists; the innovation is a central strategy and in 1999. It was defined that “the objective of the new strategy using open innovation practices is to turn more technologies into products...P&G aims to drive new innovation through collaboration with external partners in at least 50% of cases” \[11\]. To improve external partnerships one kind of technology has been very important – the IvT. This is an instrument for simulation, virtual reality, data mining and prototype technologies to engage suppliers, customers and other sources of technology to manage external and internal interfaces of innovation process.

For P&G, innovation is fully associated with making new connections, believing that the majority of radical innovations are made possible by combining existing knowledge in new ways. In order to assist in the creation, transfer and use of knowledge beyond the boundaries of the organization, the "Connect and Develop" seeks to transform more technology into new products.

The policy of expanding the use of open innovation has made organizational changes take place in P&G, for example, the creation of the Technology Acquisition Group. Through this group, the company has licensed a number of technologies in the market to supplement their technology strategy and licensed technology to its portfolio to increase return on their investments. Initiatives such as the Innovation 2000 event were sources of information and connecting the P & G researchers and providers generating more than two thousand ideas for new products and new applications for existing technologies by the company. In addition, other ways of promoting innovation were adopted by the company, such as buying other companies and the creation of internal funds to finance innovation projects. It is also important to note that a significant change in culture to work in the open innovation was crucial to the success of the program "Connect and Develop" \[11\].

Among the future trends that can be identified on the topic of open innovation, we can highlight \[12\]: 1) expanding the number of industries involved due to subject importance increase 2) change in the intensity of industries, form the sectors of high to also low-tech, 3) expanding the scope of firm size: big to small and medium-sized, 4) improvement in the service sector and 5) incorporation of intellectual property issues as a potential business in the subject, among others.

4. A case study in the cosmetic Brazilian industry: Natura

The industry growth of Hygiene Products, Perfumes and Cosmetics in Brazil is a point to be highlighted when compared with the growth of other industries in this country. In 2011, the average growth of this industry reached 10% per year versus 3.1% per year of total GDP and 2.5% per year of general industry \[13\]. According to the Brazilian Association of Toiletries, Perfumes and Cosmetics (ABIHPEC, acronym in Portuguese), growth in this sector is particularly favored by the use of high technology and increased productivity, which is perceived in the prices of marketed products, which suffer smaller increases than the price indexes of the economy in general and by meeting the needs of the market by constantly introducing new products.

Today, the country keeps the third place in the ranking of the largest markets for cosmetics in the world, trailing only the United States and Japan \[13\]. For these reasons, the world has turned its attention to Brazil and it is possible to say that the search for differentiation through innovation will keep improving dramatically.

Competitive pressure in Brazil and the world leads companies to introduce, in a faster way, more competitive products with more respect to price and quality than their competitors. And in a changing world, this is a
challenge to leading companies, researchers and governments to think about different mechanisms and strategies to achieve more radical innovations [14].

Nowadays the arrival of large international companies bringing resources to Brazil is common news, besides the formation of alliances, acquisitions, licensing of technology and several other open innovation practices involving companies, universities and government, focused on winning prominent and representative national or global cosmetic market.

To companies that perform technological activities, the joints of their networks and alliances are some of the ways used to generate innovation [14]. They use their networks to collaborate and develop innovative solutions, acquire skills more quickly and reduce risk.

The case presented here shows a management model designed to articulate the different actors from Brazilian innovation ecosystem aligned to business strategy. This model was developed and is being validated by a Brazilian company called Natura, a consumer goods industry leader in the cosmetic sector in Brazil and that has operations in six other Latin American countries (Argentina, Bolivia, Chile, Colombia, Mexico and Peru), and France.

Currently, Natura is present in the home of 100 million Brazilians with a very rapid growth in recent years. Between 2007 and 2011, the consultants went from 718,000 to 1.4 million, bringing the product orders from 9 million to 17 million a year expressive, whereas EBITDA rose from $700 million to $1.4 billion and net revenues increased from $3 billion to $5 billion. Participation on International Operations, rased 4.4% and reached 9%.

The methodology of this study was inspired by good practice search, following the approach suggested by Slowinski and Sagal [15]. The authors propose “want, find, get and manage model” based on the principle that “Open Innovation relationship must be based on a strategic planning process that includes the external world as a potential source of talent, technology and other resources” [15, Slowinski and Sagal, 2010: 39].

Having Open Innovation and Networks as a driver for its strategy, Natura performs technology planning which is an activity that within the company aims to assess trends (consumption, market and technology), build product roadmaps, research and innovation programs, map and assess technical competences and their related gaps in order to implement its innovation strategy. The collaborative networks and partnerships management model was designed to meet the innovation strategy by assessing competences in the external network of partners and by articulating universities, companies and the government in a single framework. This occurs through the integration of four processes that aim to form, to strengthen and connect innovation networks.

Therefore, as a case study, it is followed by a description of the practices adopted in the company and a comparative analysis of the observed trends and those mapped in the future as regards the management of innovation on the grounds of the Triple Helix, by demonstrating the link among Research Institutions, productive sector and government to promote and improve R&D.

4.1 Innovation at Natura

Innovation is at the heart of value creation for Natura and permeates all strategic pillars of the company, whose vision is the search for innovation to create a stream of well-being and experiences that exceed the expectations of its network [16].

The importance of the theme of innovation in the company's strategy is reflected in its increasing investments and the rates of product release. To support these actions, Natura invests between 2.5% and 3% of its net revenues annually in science, technology, innovation, research and the creation of knowledge networks. That represented R$ 146.6 million in 2011.

Natura evaluates its innovation index by the percentage of revenue from the sale of products launched in the past two years. This index reached 64.8% in 2011. This indicator shows the importance given to product innovation in the company because of relation with the commercial performance of the organization. An external recognition of the initiatives of the company came with the emphasis placed by Forbes Magazine in its ranking in
2011; Natura was named one of the most innovative companies in the world holding the 8th position in this ranking, along with technology icons such as Apple (5th) and Google (7th) [16].

4.2 Collaborative networks for Innovation – Natura's model

Aiming to integrate the different actors from Brazilian Innovation System, Natura has established a model that has four main pillars as shown below:

a) Policies and process: includes activities that go from processes of design to internal policies definition aligned to the Innovation System and laws of countries with which the company establishes alliances and networks in the context of product innovation. It also includes the design and monitoring of success key indicators as well as guidelines for partnerships and intellectual property protection (I.P.).

The policies for IP and partnerships were developed in order to align the internal strategy for innovation and the external regulation. In all cases, these policies and good practices bring guidelines on how to establish a relation with an external partner mainly considering the best ways of sharing results, risks and investments. The main objective is to provide patterns within and out of the company when establishing new partnerships as the same time that it is possible to guarantee alignment with external policies (e.g IP, partnerships, etc).

Besides that, a process for managing open innovation was established. It goes from the selection of partners, passing through good practices for negotiation, hiring partnerships (including legal aspects and contracts) and finally it ends with the evaluation of partners. This whole process runs in a continuous flow and is directly connected to the main Innovation process (Technology and Product funnels) aiming to generate value to the company through open innovation.

It is also important to mention the creation of an internal team specialized in the management of partnerships in order to speed up internal decision-making processes, improve the quality of relationships with partners based on best practices and manage indicators. This team has a weekly schedule and is composed of professionals working in external and internal interfaces, including those areas: legal, intellectual property, management of partnerships and external relations, as well as other interfaces according to the emerging demands. The main results of this form of internal coordination are observed: continuous improvement in partnership models through multidisciplinary discussions, speed in implementing the action plans of each partnership, strengthening the governance model in the organization, guarantee policies alignment and knowledge management.

b) External Funding Acquisition and management: includes the activities for monitoring new funding opportunities aligned to internal demands, as well as a grants management structure that is responsible for technical and financial accountability reports. There is also a structure dedicated to the evaluation and use of tax incentives in Brazil, and in France. As a result of funding management US$ 540,100 were obtained based on projects developed in 2010 from National Innovation funding agency (FINEP, acronym in Portuguese) and US$ 81.8 million from National Bank for Economic and Social Development (BNDES, acronym in Portuguese). Tax incentives for innovation exceeded US$11 million in grants and funds came from different partner institutions (public funding agencies in Brazil) such as FINEP, BNDES, CNPq and FAP in 2011.

The company carries out constant monitoring of funding opportunities and improves capabilities for resource management with excellence, to ensure positive results with internal and external interfaces. To achieve it Natura keeps constant relationship with public agencies in order to meet the requirements and obligations and also makes a close project management with researchers from R&D for preparing technical and financial reports that meet all these requirements. This pillar is the responsible for bringing the government close to the Innovation process in the company.
c) Promotion of collaborative open innovation in networks: this process includes the competences related to open innovation management and networks intelligence, and is focused on partnerships with universities and corporate partnerships.

In this sense, Natura is guided by a network that involves the understanding that technological innovations are not only less a result of efforts of individual companies. When well-organized networks leverage cooperation, raising the possibility of achieving these interactions into new products, processes, services and business practices [14].

The process of development of radical innovations and complex benefits from the relationship with various partners promotes the integration of different knowledge, behavior and mental models. The formal and informal communication of people with knowledge, skills and values increases the chance to combine in previously unimaginable ways not thought of this knowledge, generating more radical discoveries. In addition, other benefits of networking may be cited as risk sharing, access to new technologies and markets, agility in launching new products, access to complementary skills, the guard of intellectual property rights through instruments contracts and access to knowledge outside the company; the collaboration established in enterprises are widely linked to the actors who are involved in the formation of networks. These actors can be suppliers, distributors, competitors, and consumers who are the interfaces of the innovation process, to consultants, trade associations, the government, researchers, clusters, funding agencies, collaborating centers, incubators and technology parks [9].

Furthermore, Natura believes strongly that universities are recognized sources of new ideas, knowledge and technology to companies [17]. In this context, among other initiatives Natura has created a structured program of open innovation and collaborative relationships with research institutions, as described below.

_Natura Campus_

The certainty that collaborative relationships are the best way to find the new, creating and improving concepts, knowledge and technology, led Natura to establish channels of relationship with the scientific community. For this, the company took an active work in science, valuing interaction with academia through a dynamic, healthy and productive relationship. It was intensified at Natura since 2001, with the first research projects in partnership with universities and research institutes in the country, confirming its belief on the benefits of the innovation networks interactions.

The program was rebuild in 2011, when it had already established partnerships with 19 research institutions in nine different states of Brazil through 39 projects for scientific and / or technology.

The Natura Campus Program can be understood as a build environment of innovation networks with the world community of science and technology. The program is also a space for learning how you can build an effective and lasting relationship between a company and institutions that have in common scientific practice and wish to promote connections between knowledge and innovation.

Natura Campus aims to strengthen Relationships with Institutions of Science and Technology and leads to the identification of synergies on possible joint research programs and the connection between Innovation actors by promoting knowledge and tools and methodologies that prioritize inter-organizational collaboration.

The strategy of open innovation has been strengthened with the new tools introduced in Natura Campus Program in 2011, based on the build of knowledge networks through the sharing of information about science, technology and innovation; hosts expert blogs, and receiving suggestions for research partnerships that allows the joint research with Natura and the entire network [16].

These actions and tools implemented recently in the Natura Campus Program aims to consolidate the customization with the relationship with the scientific community, which has a pattern of behavior specific and very unique, unlike the relationship with suppliers. This corroborates the view of Kurman [17] in saying that "each university takes a different approach to excellent relationships with the business"."
d) Relationship Management focused on Innovation partners: this activity involves the management of a relationship agenda including the different innovation partners, such as funding agencies, universities, corporate partners and government aiming to align expectations and maintain a constant flow of communication that will lead to the identification of opportunities. As pointed out by Gassmann et al (2010) the fragmentation of dimensions related to open innovation knowledge and process represents a challenge for the evolution of this field of study.

The main challenges in the interactions between companies and their network are to integrate the various actors involved in partnerships, creating a collaborative environment considering the risks and sharing results and creating value for all involved.

Adopting a model of relationships with network partners, it is possible to map the skills available in the network, understand their applications and results generated in the partnership development and propose actions that can improve the contribution to innovation of this network.

Through relationship actions with a focus on listening to this network and opportunities for improvement in the generation of innovation and opening channels for dialogue, we can adopt best practices for collaboration with a focus on broadening the perspectives of interaction.

Another important point is the adoption of specific rituals that promote the sharing of innovation strategy, stimulating the opening of the network and join forces in pursuit of initiatives that promote different results and that provide benefits for all involved.

The opening of a channel of dialogue and the adoption of rituals to share strategies favors the extension of the look on the network of partners and brings an understanding that not always the one who is more related to day-to-day can best contribute to an innovation strategy.

Therefore, the structuring of processes and guidelines to extend the connection to the network of partners linked to the company network is critical to expand the possibilities for innovation.

Moreover, it is necessary to develop different models of interaction, considering alternatives for feasibility and return on investment partnerships, especially when one has in mind a medium and long term relation.

5. Conclusions and policy recommendations

This paper presents a set of good practices with the integration of activities and processes for managing strategic networks and partnerships organized into a model capable of delivering value to the company innovation strategy at the same time that it emphasizes the role of each actor in the National Innovation System and seek ways to strengthen innovation networks.

However, considering the international experiences evaluated, we can consider that the model is quite robust and well founded, but needs to broaden its scope with regard to the construction of integrated tools and platforms for interaction with the external and internal interfaces in the Natura facilitating and organizing processes communication and knowledge management, still, the generation of opportunities for connection between the network of innovation partners to each other, increasing opportunities to bring providers and universities also seeking public support for research of interest to the company remain as points of leverage in the future.

Another model for improvement and also a future research theme is the negotiation of intellectual property of the partnership projects as “patent valuation remains quite problematic, as most patent transactions are not reported publicly, and patents are highly idiosyncratic by their very construction” [12].

Finally, it is possible to mention that this case represents an important model for other companies that aim to effectively implement actions to improve value through the integration of the main actors in an Innovation System based on the Triple Helix concept. For academics, it may represent an important study case on how a company has been leading and implementing actions on this field of study.
References


