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Developing an open innovation capability in MNCs in emerging markets

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Abstract

The benefits of using open innovation to increase the results of R&D activities are widely recognized. Yet, while extant research has primarily focused on the benefits, limitations and mechanisms of external collaborations, it has not sufficiently explored how firms implement an open innovation strategy. This paper proposes embedding open innovation entails balancing: a) the skillfulness of the team to implement an open innovation outbound strategy and b) the cumulative integration of open innovation programs into the firm's strategy. Here, we report upon the study of a Brazilian multinational (Natura Cosmetics) and explain how it balanced these two dimensions over 14 years. We identified the implementation of an open innovation strategy occurs in three phases: initiation, implementation and establishment. Moreover, we identified boundary spanners and leadership support is fundamental to help connecting internal technological problems with external partnerships, which simultaneously requires the appropriate open innovation program.

Developing an open innovation capability in MNCs in emerging markets: The case of Natura

The benefits of using open innovation to increase the results of R&D activities are widely recognized. Yet, while extant research has primarily focused on the benefits, limitations and mechanisms of external collaborations, it has not sufficiently explored how firms implement an open innovation strategy. This paper proposes embedding open innovation entails balancing: a) the skillfulness of the team to implement an open innovation outbound strategy and b) the cumulative integration of open innovation programs into the firm's strategy. Here, we report upon the study of a Brazilian multinational (Natura Cosmetics) and explain how it balanced these two dimensions over 14 years. We identified the implementation of an open innovation strategy occurs in three phases: initiation, implementation and establishment. Moreover, we identified boundary spanners and leadership support is fundamental to help connecting internal technological problems with external partnerships, which simultaneously requires the appropriate open innovation program.

Keywords: Open innovation; capability lifecycle; strategy; emerging markets; boundary spanners; process research

1. Introduction

Open innovation scholars have explained distinct methods firms use to design and implement an open innovation strategy. Indeed, previous research recognizes the implementation of open innovation as a process with numerous twists and turns (cf. Chesbrough & Appleyard 2007; Chesbrough & Brunswicker 2014; Chesbrough & Crowther 2006; Chiaroni et al. 2010; Enkel et al. 2011; Mortara & Minshall 2011) where the use of innovation programs can help to implement an open innovation strategy i.e. P&G's Connect+Development, GE's ecomagination, Fiat's research center, Xerox's PARC (cf. Chesbrough 2003; Chesbrough 2012; Di Minin et al. 2010).

Yet, open innovation research has not explained how firms learn to establish new external partnerships while simultaneously implement an open innovation strategy. Indeed, Vanhaverbeke and Cloudt (2014) pointed out to the limited open innovation research studying firm's open innovation strategies and managerial decisions to adopt open innovation. For example, previous open innovation studies do not explain when and how firms adopt an open innovation strategy or what leads to changes in the

strategy over time. For example, while the study of Enkel et al. (2011) presents different capabilities firm's need to develop to fully adopt open innovation, their study does not suggest how firms develop and improve existing capabilities or design new programs to conduct open innovation over time. Furthermore, previous studies only present a top-down implementation approach of open innovation. For example, at Procter & Gamble (P&G), the Connect+Development program was installed as the open innovation strategy of the newly appointed CEO, A.G. Lafley to change the P&G's innovation model (Huston & Sakkab 2006).

In a nutshell, while previous open innovation studies have not deeply studied how an open innovation strategy evolves, the strategic organizational change literature has explored these issues from numerous perspectives i.e. core and dynamic capabilities, organizational learning, managerial cognition in organizational change (Gavetti & Rivkin 2007; Helfat & Peteraf 2003; Teece 2007; Tripsas & Gavetti 2000). Hence, a comprehensive process research could help to better explain: (1) how does an open innovation capability evolves along two dimensions: a) new collaborations with external partners and b) creation and integration of new programs as well as 2) what factors influence the changes in the development of an open innovation capability.

To answer these questions, this paper presents the process of how the R&D unit of a cosmetics firm located in Brazil changes its open innovation strategy over 14 years (from 2001 to 2014) to start and, after some time, increase the collaboration with external partnerships. Our selected company is Natura Cosmetics S.A. *, which now has an established open innovation strategy to collaborate with research institutions; recently inaugurated an innovation hub in the Brazilian amazon forest to enhance its collaboration with its potential suppliers and universities; and conducts other innovation activities widely recognized in the open innovation literature e.g. co-creation, Hackaton, crowdsourcing. Yet, in this paper, we focus exclusively on the process of implementing the open innovation strategy.

This paper suggests a strategic change process, from closed innovation to open innovation, involves continuous changes in: 1) the skillfulness of the team to implement an OI outbound strategy (from Few and problem driven collaboration to

* <http://www.natura.com.br/www/a-natura/inovacao/>

Many and strategy driven collaborations) and 2) Cumulative integration of open innovation programs into the firm's strategy (no OI programs to many and integrated OI programs). These changes occur throughout a capability lifecycle (Helfat & Peteraf 2003), which includes three phases initiation, implementation and establishment. In this article, we use Natura's open innovation case to connect the open innovation strategy literature (Chesbrough & Appleyard 2007; Enkel et al. 2011) with the strategic organizational change literature (Tripsas & Gavetti 2000). Our contribution suggests the implementation of an open innovation strategy requires a balance between the breadth and depth of external collaborations (Laursen & Salter 2006) with the establishment of open innovation programs (Enkel et al. 2011).

This paper is structured as follows: the next section presents our conceptual framework, which highlights the proposed dimensions, an open innovation capability lifecycle. Section 3 discusses our research strategy; followed by a brief review of Natura's strategic innovation process (Section 4) and the drivers affecting changes in the structure, process and support for open innovation. Section 5 discusses the implications of this study for explaining open innovation strategies. The final Section 6 presents some limitations of our study and wraps up the main conclusions and recommendations for future research.

2. Conceptual framework

While previous research presented different models to explain the adoption of open innovation i.e. maturity framework, organizational change (Chiaroni et al. 2010; Enkel et al. 2011), these findings do not consider how firms develop a capability to facilitate the implementation of open innovation. For example, the open innovation taxonomy proposed by Mortara and Minshall (2011) predicts firms will preferably move from a bottom-up centralized or decentralized approach to a top-down centralized approach. Yet, this study or others (Chiaroni et al. 2010; Enkel et al. 2011) do not inform about the learning capability to: 1) collaborate with external partners or 2) coordinate numerous internal and external open innovation programs.

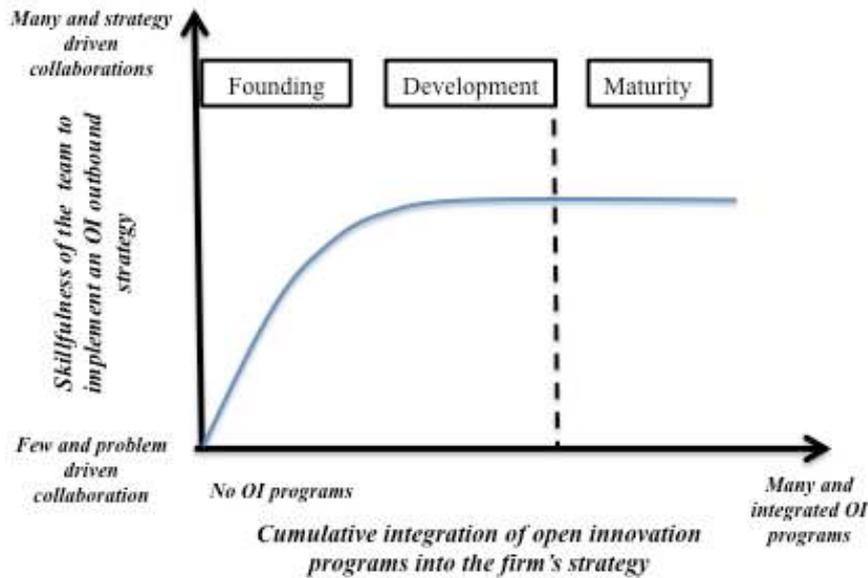
In this paper, we use the industry lifecycle framework which is widely used to explain the evolution of markets (e.g. Klepper 1997). Specifically, we adapt the capability lifecycle framework (Helfat & Peteraf 2003) to explain how firms, over

time, can move from an inexistent or low open innovation capability stage to a mature maturity stage. This framework offers the opportunity to study how firms might renew the capability. For example, figure 1 is an adaptation of Helfat and Peteraf (2003) capability lifecycle model. The horizontal axis represents the cumulative amount of open innovation programs into a firm's strategy and the vertical axis represents the ability to collaborate with external sources.

First, on the vertical axis, the level of skillfulness of the team to implement an open innovation outbound strategy reflects the novelty of the knowledge that the firm is capable to obtain from deeper or broader sources of knowledge (Laursen & Salter 2006; Nooteboom et al. 2007). For example, previous research has suggested the concept of depth and breadth to indicate the characteristics associated with simultaneous local and distant search in complex systems, respectively. Yet, firms do not only consider where to search (Lopez-Vega et al. 2012) but also the alignment of the external sources to firm's open innovation strategy (Vanhaverbeke & Cloudt 2014). For example, firms with a high absorptive capability will have higher opportunities to search, recognize and assimilate knowledge that is valuable for commercial ends while firms with low absorptive capacity will not be able to value, search and apply knowledge from external knowledge (Hughes & Wareham 2010).

When firms conduct open innovation to solve internal R&D problems, problem solving involves searching in a certain space for solutions (Laursen 2012). Hence, a fundamental issue revolves around how do firms learn to select the sources to use to search for solutions to their problems or increase the number and type of external sources (Chesbrough & Crowther 2006; Laursen & Salter 2006). For example, theories of experiential learning suggest that searches tends to initiate as local, implying that firms primarily search in the vicinity of existing routines and previous solutions (Levinthal & March 1993). For example, local search benefits from the advantages of specialization, as inferences can be drawn by comparing new findings with accumulated experience (Dosi 1982). Comparatively, with the time, a more distant search space enables recombination and innovation (Jeppesen & Lakhani 2010).

Figure 1. An inbound open innovation capability lifecycle



Second, on the horizontal axis, open innovation represents an external capability that explains how firms' external collaboration programs can be learned and improved over time (Chesbrough 2003). Moreover, it also includes the development of a capability to connect and integrate different open innovation activities to benefit from external solutions (Grant 1996). Open innovation research has highlighted the kind of programs that are commonly used by firms to launch an open innovation strategy i.e. technology scouts, intermediaries, creation of ecosystems (Chesbrough & Appleyard 2007; Huston & Sakkab 2006). For example, a widely known successful implementation of an open innovation strategy is Procter&Gamble's Connect+Development program (Huston & Sakkab 2006). This program has portrayed how open innovation can be incrementally implemented at a large MNC through careful selection of business unit needs, selection of networking initiatives, and changing the innovation culture of P&G. A similar example, GE's ecomagination initiative (Chesbrough 2012) which portrays the use of open innovation contest to receive new ideas for an strategic area of GE's energy technologies.

Most of these studies, however, have not explained how R&D units could systematically adopt open innovation from a disconnected project-based approach to an integrated innovation strategy. Indeed, research has not explored how firms overcome the challenge of organizing formal and informal practices that could facilitate the shift from a closed innovation to an open innovation mindset (Chesbrough & Brunswicker 2013).

3. Research design

3.1. Sample selection and data collection

Until now, most open innovation studies have been conducted in markets where knowledge flows are abundant and formalized i.e. Europe and United States. Yet, studies in emerging markets are limited to a few cases e.g. China, Taiwan, India. Open innovation studies in areas like South America or Africa are inexistent. Since 2000 Brazil has experienced a high economic growth accompanied with an increasing number of different R&D strategies, business models, value creation and capture initiatives for Brazilian and foreign firms (Casanova & Kassum 2014; Fleury & Fleury 2011). Second, the personal care or cosmetics sector is an interesting and distinct topic of analysis as, historically, it has been a very R&D intensive sector i.e. pharmaceuticals as well as very responsive to consumer demands i.e. food, beverages sectors. Only some large MNCs are able to work in both in the personal care and food sectors i.e. P&G, Unilever (Huston & Sakkab 2006). Yet, the majority of personal care companies prefer to specialize and rather innovate in the cosmetics sectors with fast updates in the product portfolio or business model i.e. Avon or Oriflame (Edsta 2008; Klepacki 2005). Firms operating in the cosmetics sector require large R&D investments to cope with the speed of new product development, globalization, consumer requests and global competition (Jones 2010). In this section, we present our sample selection section and data collection strategy; data analysis; and validity of the process study.

This study aims to improve our understanding of the process how an open innovation strategy gradually evolves within a firm. Thus, the data collection procedures were twofold. First, from February to August 2014 in Sao Paulo, Brazil, the data for the case study was collected through interviews and numerous separate meetings with two open innovation managers. We included 28 interviews and meetings with the CIO, BU directors, director of innovation managers, scientific managers, coordinators, coordinator, etc. (See Appendix A for detailed information). All these interviews were recorded and transcribed and informants provided additional archival information i.e. diagrams, charts. Second, numerous archival and confidential information was provided to better understand how over 14 years Natura Cosmetics

progressively change the innovation strategy where we particularly focus on the elements and mechanisms enabled by the innovation unit.

3.2. Data analysis

The analytical approach used in this paper is process research (Langley 1999; Poole et al. 2000). Here, we recognized that an evolutionary model of change is the most advantageous to study of Natura's strategic organizational change process. Based on Tripsas and Gavetti (2000) paper of capabilities and cognition and other studies exploring the implementation of open innovation (Enkel et al. 2011; Mortara & Minshall 2011), the unit of change was the open innovation capability lifecycle composed of: 1) Natura's Skillfulness to implement an open innovation outbound strategy and 2) the cumulative integration of open innovation programs into Natura's strategy.

In this paper, we used a *teleological framework* of change (Van de Ven & Poole 1995) to study Natura's repetitive sequences of goal formulation, implementation, evaluation, and modifications of its open innovation strategy. We adopted this method because we have a single in-depth single-case case of analysis but with many units within the single organizations and the mode of change within Natura is *constructive* because results are unpredicted and detached from previous activities. The adopted method to analyze the data is phasic analysis that allowed us to capture the overall coherency of the open innovation strategy (at a higher level, more global and longer-term patterns) in three different but comparable phases.

In our analyses of the data, we noticed that development sequence was simple unitary with a cumulative addition model. This model allowed us to study the elements that were carried in consecutive phases. We began our analysis by dividing the 14 years process into sequential phases. After coding the data into different incidents and events, we parsed it onto different phases (see appendix B). Finally, the data was analyzed applying the method of sequence comparison with optimal matching. This method facilitates the comparison of distinct sequences of repeating events. Moreover, it allows us to measure the distance between any two sequences.

4. Findings

This section is divided as follows; Section 4.1 presents a narrative description of Natura's open innovation strategy from 2001 to 2014. Following, Section 4.2 presents our analysis of Natura's open innovation strategy.

4.1. Natura's open innovation implementation process

In 2001, at Natura open innovation started as a joint-venture company initiative dedicated to research, which was named Flora Medicinal. The company decided to participate on a public process to access funding and established partnering projects with universities. Three projects were developed with federal funding in a specific research area i.e. fitoterapic ingredients. Following, Natura and the most relevant state research agency launched a call for proposals using the theme of biodiversity research. Nine projects were selected and developed in partnerships sponsored by Natura and State Support Agency for Research (FINEP). During this stage, managers experienced a gradual evolution from a project-wise approach to more structural initiatives. These attempted to emphasize the benefits of collaborative R&D initiatives.

Following, around 2006, some initial open innovation issues emerged i.e. how to build a systematic channel to increase and manage open innovation at Natura? How the company could create a more intense flow of knowledge from the academia and how this interaction should be implemented? An initial response to these questions was the implementation of the Natura Campus Program, as initiative to foster R&D cooperation with universities. Following, Natura developed internal processes to evaluate and select publicly funded projects. Natura did not benefited from new partnerships but also additional personnel was dedicated to open innovation and new formal elements were set up e.g. skills, methods to co-operate with external partners. Finally, an incentive to reward external partnerships and promote an open innovation culture, Natura created a biannual prize offered in 2008 and 2010. Several partners were recognized with these awards meetings, which contributed to spread the Natura Campus program. Until 2011, 33 partnering projects were developed; the webpage received around 500 visits monthly; more than 215 research groups were registered; and around 104 project submissions reported. However, a key problem was the low percentage of proposals that were aligned to the research interests of Natura. Hence,

the internal processes for investing in strategic open innovation projects were not well connected to the innovation budget.

In 2011, the third phase of Natura's Campus program started with relevant questions about its growth and opportunities. One of the strategic goals was creating networks of research and innovation. This entailed that the program should be able to engage not only universities but also companies interested on collaborative R&D. This was a significant change where Natura will use a technology-push approach and market-pull models to identify future innovation opportunities. In 2012, a call for projects allowed to Natura receiving 327 project proposals in more than ten fields of research. Entrepreneurship courses and experiences were implemented together with the researchers, specially with the finalists aiming to identify the best personal profiles to get a partnership with Natura. These kinds of actions also included several workshops into the research institutions putting together business managers, scientific managers from the company and researchers from the academia. In parallel, a strong diffusion about science and technology of Natura was promoted.

Currently Natura Campus has been facing new evolution process following the strategic plan of Natura, such as: How to engage and co-create solutions and radical innovations in collaborative multi-model public? These challenge has been faced looking at the potential for articulate the specialized network to add innovation to products and services focused more on radical innovation and specific fields of technology development of Natura innovation strategy.

4.2. Capability life cycle

This section presents the key events and incidents related to the skillfulness of the team to implement an open innovation outbound strategy as well as related to the cumulative integration of open innovation programs into the firm's strategy. Additional detailed information could be found in Appendix B.

4.2.1. Initiation phase (2001 – 2005)

The collaboration with external partners at Natura, on the one hand, started through the acquisition of a small research company to foster R&D. The name of the

acquired company was Flora Medicinal and it is considered as the first external partner. During 2001 – 2002, Natura started with open innovation through the acquisition of skills necessary to conduct R&D projects and knowledge transfer with national and international players. Following, during 2003 – 2004, Natura established a strategic partnership with the biggest funding agencies in Brazil – FAPESP and FINEP – to undergo a new plan for collaborative R&D plans. FAPESP launched together with Natura a call for proposals together with Natura and FINEP financed collaborative R&D projects with federal universities. In total, 15 projects were conducted which helped to obtain evidence on the benefits of external collaboration i.e. patents, product insights, etc. Finally, in 2005, Natura's team focused on the implementation of initiated projects and dealing with arising collaboration problems i.e. NIH syndrome, IP protection, internal boundary spanners

On the other hand, in 2001, Natura moved from its old R&D headquarter in the city of Sao Paulo to new and larger facilities in Cajamar (30 Km from Sao Paulo). This structural change was accompanied with the intention to have a stronger R&D unit to support innovation for different business units. Following, from 2003 – 2004, R&D managing directors observed earlier results of ongoing external collaborations and rapidly reinforced the need to conduct R&D projects with universities and other science partners. The year 2005 was major turning point for Natura's Research strategy: 1) it increased the number of researchers from 10 to 50; 2) open innovation was formalized as the form to collaborate with external partners; 3) it formalized the open innovation activities hiring three dedicated employees who focus on university collaborations and funding agencies; 4) new innovation managers started developing its strategic plans considering possibilities to access knowledge outside Natura; and 5) Started to select research topics from our strategy to promote roadshows at universities with the objective to engage external researchers to propose projects to Natura. Yet, Natura's clearest statement to adopt open innovation as part of the innovation strategy was the statement that by 2010, 50% of research projects should be conducted in partnerships with external partners.

4.2.2. Implementation phase (2006 – 2010)

During this period, on the one hand, Natura's main objective was to create internal and external policies in order to guide the relationship inside and outside Natura and

its many partners. Moreover, during this period, it was very relevant to disseminate and establish Natura Campus program and the strategic collaboration for specific research topics with Brazilian universities. Moreover, Natura begun formalized the collaboration strategies with market-based partners i.e. suppliers, customers. Yet, these had to be research focus.

In this phase, on the other hand, the Open innovation team was primarily centred on embedding open innovation within Natura. For example, Natura Campus program facilitated connecting company needs with external research groups. This facilitated achieving the target to have at least 50% of research projects with external collaborations, already by 2008. Moreover, a new market product was launched which resulted out of a previous open innovation partnership with Brazilian University in 2002. Finally, in 2010, the open innovation strategy was changed, for a second time, from a supportive role to business units to have its own personnel reporting to a new innovation VP. This happened due to other major at Natura and a Chief Innovation Officer who believed that open innovation should be central for Natura.

4.2.3. Establishment phase (2011 – 2014)

In this final phase, on the one hand, Natura had a clear plan to enhance the collaboration with existing partnerships and initiate collaborations with previously unidentified knowledge sources. However, a key change was the form of collaboration for open innovation programs, which had to be redesign to initiate a strategy-driven collaboration and not simply based on the broadness or deepness of Natura's network. This was achieved through the use of distinct programs i.e. Natura Campus, Co-Creation, etc. Moreover, the intention to go beyond existing Brazilian partners i.e. universities or suppliers was reinforced with the inauguration of an R&D subsidiary in Boston to have closer contact with other firms in the cosmetic industry. Finally, the result of this recombination stage resulted in a plan to strengthen relations with existing partners and increased participation of new partners.

In this final phase, Natura also aimed to develop faster and more radical innovations, which can emerge out of new partnerships with complementary skills. This new version of Natura Campus program was disseminated through 164 different channels

in four different areas: 1) new innovation projects; 2) sustainable surfactants; 3) flexible packaging; and 4) insoluble ingredients. Moreover, in 2013, the Co-creation with Natura initiative was launched to involve the partnership with customers and Natura sales representatives. In 2014, although the breadth of collaboration with external partners was broad enough, Natura decided to reformulate the form of collaborations with preferable partners to combine co-creation activities and prototyping.

On the other hand, in this phase, Natura's previous collaboration form with external partners was changed significantly. Specifically, 1) from a national to an international innovation scope and 2) from a relationship perspective with multiple partners and not science driven to specific collaborations with scientific partners. For example, in 2011, Natura launched an internal OI platform to manage innovation related partnerships. Specifically, the platform named iQlicar would help to: map the partnerships network of Natura; measure and improve performance and contribution to open innovation activities; establish a closer relationship based on mutual contractual understanding; design development activities with a focus on innovation; and identify the contributions of specific partnerships. Although in 2011 the iQlicar platform was dismissed, in 2012, it initiated as the internal platform to manage open innovation partnerships. A total of 181 partnerships were involved in the innovation process: 131 companies; 29 ICTs; 16 specialized partnerships; 4 NGOs and 1 regulatory agency. 51% were associated with the product funnel and 84%.

Moreover, Natura's new strategic plan included new collaborations with external partners in four different areas: 1) integrated communication; 2) international reach; 3) embedded in scientific discoveries; 4) multichannel and multi-tool program. In this last phase, Natura Campus Program challenges involved sustainable raw-materials, packaging and new ingredients; Natura Campus Amazon Vegetal Ingredients Prize; All of these efforts resulted in the biggest call for proposals ever launched at Natura where 13 Projects approved. Also, in 2012 a new form of collaborating with external partners was launched. This was named as co-Creation with Natura, which seeks for new collaboration forms with consumers. In its initial launch, Co-creation with Natura was divided in three big areas: co-creation transparency; co-creation mothers and children; and co-creation 'what is Brazil'.

Finally, in 2014, Natura reinforced the three open innovation programs: Natura Campus program, Co-creation with Natura and IQlicar. It also planned two new programs to acquire external knowledge: 1) Hackaton – Natura Campus Media Lab; 2) accelerated incubation initiatives. Currently, Natura's open innovation process is driven by a specific innovation strategy and not simple opportunities to collaborate with new or established partnerships. Technological partnerships, to collaborate in the development of a technology or product, have a well established innovation strategy deciding on the type of partnership i.e. national, international, science- or market-driven. In the past, Natura's strategy was principally driven by external possibilities to organize collaborative projects i.e. governmental funding, etc. which were not necessarily part of Natura's open innovation strategy.

5. Discussion

The previous section detailed how a firm implemented open innovation in three different phases which resemble a capability lifecycle (Helfat & Peteraf 2003). In this paper, we proposed that an inbound open innovation strategy is based on the skillfulness of the team to implement an open innovation outbound strategy which can range from few and problem driven collaboration to many and strategic driven collaborations. We deduced that for technological needs firms search for external knowledge not only considering the optimal number of collaborators (Katila & Ahuja 2002; Laursen & Salter 2006) but also the contribution and fit of external knowledge partnerships with the firm's open innovation strategy. For example, Natura started with few partnerships with Brazilian universities to address very specific technological problems for distinct business units. Yet, over the time, the ability to collaborate with external partners did not only involve more and diverse collaborations but also the ones with more alignment to Natura's innovation strategy.

Second, in this manuscript we proposed that the cumulative integration of open innovation programs into the firm's strategy is vital for embedding an open innovation strategy. In this paper, we proposed open innovation programs are an established mechanism employed by firms to implement and formalize open innovation (cf. Chesbrough 2012; Huston & Sakkab 2006). Here, firms can move from not formalized open innovation programs to many and formalized open

innovation programs. At Natura, we noticed open innovation started with informal partnership programs that were funded by governmental institutions. Yet, in 2014 Natura has already five open innovation programs that are synchronized to help the company to obtain knowledge from different types of partners and for specific purposes: 1) Natura Campus for scientific and technology collaborations; 2) Co-Creation with Natura for Collaborations with customers; 3) Hackaton Natura Campus for collaborations with scientific partners and customers; 4) iQlicar for maintaining a collaboration with established partners; 5) and a new network program to facilitate collaborations with start-ups and other actors in the Amazon region. In 2014, Natura renewed its open innovation capability to overcome a possible maturity stage that will hinder its possibilities to obtain valuable knowledge for Natura (Helfat & Peteraf 2003).

In this paper, we inductively recognized the relevance of key resources: 1) boundary spanners and 2) leadership support to induce changes in the different phases of the capability lifecycle. First, boundary spanners work coordinating internal innovation projects with external solutions using different innovation programs. At Natura, the role of boundary spanners (Allen 1977) increased over the last 14 years. Initially, open innovation was synchronized by one manager and, over the time, increased 30 people working exclusively on open innovation programs. Currently, boundary spanners are vital in the selection of problems to be search externally, alignment of the partners to the open innovation strategy, advice on IP, contractual and evaluation techniques, profiling and evaluating existing partners and identification of new partnerships. While previous research highlighted how intermediaries can help in the search of external knowledge (Jeppesen & Lakhani 2010) and the role of internal gatekeepers (Du et al. 2014), open innovation research has not highlighted how internal boundary spanners can help in coordinating business units to search for external knowledge. This manuscripts sheds light to the necessity of having a larger number of boundary spanners who have different open innovation competences to coordinate different innovation programs. Indeed, each boundary spanner should have an specific competence i.e. collaboration with users, universities, building up networks.

Second, researchers have explained how large MNCs i.e. Procter&Gamble, GE adopted open innovation as a top-down approach (Chiaroni et al. 2011; Salter et al. 2014). However, firms have other alternative paths to implement open innovation i.e. centralized, decentralized (Mortara & Minshall 2011). This paper presents a bottom-up implementation approach of open innovation, which emerged over 14 years where senior management increased the support for open innovation i.e. a larger open innovation unit, more exclusive resources and including open innovation on the firm's strategy plan. Currently, as open innovation programs are becoming popular to start open innovation within firms, these face a growing interest to understand the process of embedding open innovation in the firms' strategy. Currently, open innovation has become a competitive necessity where the successful implementation of an open innovation program is key to obtain a competitive advantage. Thus, innovation programs such as Natura Campus, Connect+Development, GE's ecomagination initiative are a powerful force to attract external available knowledge within the reach of their business units. Yet, to earn returns from open innovation, MNCs need to ensure the use of these programs dovetails with an overall innovation strategy, selection of projects and corporate support (Enkel et al. 2011). The companies that profit from open innovation are those that adapt their open innovation strategy in line with the new opportunities offered by the use of these programs i.e. involvement of partners, connection with universities.

6. Conclusions, limitations and further research

This research paper presented the implementation of an open innovation strategy as a capability lifecycle which grows along: a) skillfulness of the team to implement an open innovation outbound strategy (Laursen & Salter 2006) and b) cumulative integration of open innovation programs into the firm's strategy. This paper presents open innovation strategy as an incremental process, which depends on: 1) the ability of the boundary spanner to identify and integrate multiple external sources of knowledge with specific technology needs using specific innovation programs and 2) the ability to involve more human capital to coordinate open innovation projects with external partners.

Second, while previous open innovation studies have been focus either on high-tech corporations or conducted in developed countries, this study is carried out at a manufacturer and marketer of cosmetics located in Sao Paulo, Brazil. This increases our knowledge about open innovation in non-technology sectors and in emerging markets. Moreover, while the findings of this paper might not be generalizable to other industries, the cosmetic industry is a globalized sector, primarily dominated by American and European brands (Jones 2011). In this global scenario Brazil is the 3rd largest consumer of cosmetic products in the World, after the United States and Japan (Euromonitor, 2008) where cross-sector i.e. chemistry, biology, pharmaceuticals R&D activities are necessary to develop new radical innovations.

Some limitations of this paper include the generality of our findings because we conducted this research at one single firm. Also, we conducted a retrospective process research study and could not capture the events and incidents during the initiation and implementation phases. Certainly, further research is needed to invested open innovation in other firms from emerging markets. Currently, while the role of foreign subsidiaries in emerging markets is capturing the attention of innovation scholars (Figueiredo 2011; Vijay Govindarajan et al. 2012) as well as the research about innovation strategies of MNCs from emerging markets (Borini et al. 2012), the field of open innovation has apparently ignored the implementation of open innovation in this geographical area.

We suspect that the empirical setting of this paper opened new opportunities to future open innovation research in emerging markets and non-technological industries. Despite these discoveries, to our knowledge, open innovation studies have not explored how firms in emerging economies implement a global open innovation strategy to compete with national and foreign players. Further research could also investigate whether the proposed open innovation capability lifecycle is applicable in other industries and locations or to top-down implementation strategies. Finally, the comparison whether open innovation strategies from emerging markets have a higher or lower performance as the one from emerged economies is a very intriguing question. Finally, we notice that emerging markets – particularly Latin American – need a strong support of governmental institutions i.e. funding agencies to initiate open innovation activities. Thus, researchers could explore what is the relevance of

external agencies facilitating the implementation of open innovation in emerging economies.

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Appendix A: Respondents: Position and main responsibilities

No. of interviews or meetings	Position	Main responsibility
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1	Chief Innovation Officer and president of the Brazilian Association of R&D innovative companies	Directing R&D and innovation at Natura
2	Director of open innovation	Overseeing and planning all the open innovation activities at Natura
1	Director of EKOS Business Unit	Product Development and Marketing - responsible for different product lines of Natura
1	Director - Advanced Research	Structuring research activities at Natura into the innovation process.
1	Director - Consumer Safety	Technical validation of the products, regulatory issues, product's effectiveness
1	Director - Product development	Product Development process into the innovation process
1	Director - of advanced research	Research manager; innovation intermediaries; NineSigma
5	Open innovation Manager	Open innovation and Natura Campus
5	Ecosystems Management manager	Natura Campus and Innovation Systems at Natura
1	Manager	Manager of the SOU product line and involved in the Natura Campus Challenge for sustainable packaging
2	Manager	Innovation Manager into the Business Unit; Leader at Business Unit for the Oil's Natura Campus Challenge 2013
1	Scientific Manager	Amazon vegetal ingredients and Natura Campus initiatives
2	Senior Coordinator	Natura Campus and Partnerships management in the Amazon region
1	Coordinator	Manager of Co-creation with Natura (Cocriando Natura) which is an open Innovation Program
1	Coordinator	Natura Campus and Partnerships management
1	Scientific Manager	Natura Campu's Oil Challenge
1	Intellectual Property Coordinator	IP Process, Industrial Protection Implementation, Guidelines at Natura and practices

Appendix B: Incidents over Natura's Capability lifecycle

Phases	Incidents: Related to 'skillfulness of the team to implement an OI outbound strategy'	Incidents: Related to 'cumulative integration of open innovation programs into the firm's strategy'
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Initiation phase: 2001 – 2005	<p>a) Acquisition of a small research company to foster R&D and bring know-how. The name of the acquired company was Flora Medicinal and it is considered as the first external partner; b) R&D Projects were developed establishing interchange of people in different teams and knowledge management; c) Natura has started on its open innovation journey, learning how to open R&D initiatives, knowledge transfer and internalization of the new technologies into its own process.</p>	<p>a) Publicly funded R&D project with public universities from Sao Paulo to study the benefits of 3 components. The funding agency was FAPESP; b) External contributions as projects and new relations started to become part of Natura's R&D efforts. At this time, Natura's innovation strategy was not yet a formalized open innovation strategy but it showed clear signals of openness to external partners.</p>
	<p>a) Natura established strategical partnerships with the most important funding agencies in Brazil to search for synergies on collaborative R&D; b) Two initiatives were developed rising R&D investments of Natura. FAPESP (2003), the main state funding launched a call for proposals together with Natura. FINEP (2002), a federal funding agency, supported collaborative R&D projects with federal universities; c) More than fifteen projects were developed achieving important innovation results in terms of patents, products for strategic business units.</p>	<p>a) Top innovation management started to provide support to expand the Natura's open innovation relevance; b) The results of open innovation strategy started to be clear for the innovation leaders in different levels of the organization; c) an open innovation culture evolved because external relationship for R&D became something common inside the Innovation Vice-Presidency.</p>
	<p>a) Focused on the implementation of the projects and the importance on dealing with relational challenges; b) Internal process started to set up, such as: intellectual property protection, partnership agreements; and strong connection with the legal department c) Natura Campus platform was launched. It was perceived as an open digital channel to receive innovation proposals from universities.</p>	<p>a) First time Natura declared on its innovation strategy the adoption of open innovation. Natura established a dedicated team for open innovation (3 people) and the focus was on partnerships with universities and funding agencies; b) After 2005, innovation managers started to develop their strategic plans considering possibilities to access knowledge outside of the company; c) Natura established the target of 50% of its research projects being done in partnership until 2010; d) Started to select research topics from Natura's strategy to promote 'roadshows' at universities with the objective to engage external researchers to propose projects to Natura.</p>
Implementation: 2006 – 2010	<p>Increase in the number of visits (road-shows) at universities to present Natura Campus and Natura's strategic research topics. Implementation of the first Natura Campus prize to recognize the best collaborative projects with academia</p>	<p>a) Results of open innovation started to be reported in Natura's corporate scorecard (to reach the target of 50% of research projects developed in open innovation partnerships); b) First research groups begun connection to Natura Campus and proposals were receive through Natura Campus portal</p>

	<p>Started to structure process and policies for open innovation with suppliers, customers but the focus remained on research projects</p>	<p>The target of 50% open innovation projects in the R&D unit was reached two years before planned; b) First product line (Natura Chronos Passiflora) was launched with an ingredient developed in partnership with a Brazilian university in 2002.</p>
	<p>Natura obtains a Brazilian prize for the Natura Campus program</p>	<p>Expansion of the open innovation strategy, considering now the entire innovation departments and including initiatives with suppliers and some related to outsourcing less complex R&D activities. As a result in the structure, the open innovation team started to report to the innovation VP.</p>
<p>Establishment phase : 2011 - 2014</p>	<p>a) Initial plan to reach beyond existing innovation partners and collaborate with new potential partners; b) This was performed through the use of different dissemination platforms, scientific conferences and social networks. To enhance collaboration an R&D subsidiary was open in Boston; c) The new Natura Campus strengthened relations with existing partners and increased the participation of new partners.</p>	<p>a) A new initiative is to connect and improve open innovation programs to reach a broader and deeper variety of external partners. Previous disconnected open innovation initiatives are abandoned; b) A new format of two new open innovation programs is launched: 1) Natura Campus Program iQlicar is put in place to have a better relationship management with innovation partners; c) Both programs – Natura Campus and Co-creation are synchronized in Natura's OI strategy to search for external solutions (locally and internationally) in science-based and market-based partners.</p>
	<p>a) The strategic management of the network was as follows: 1) Strengthening, achieved through relationship to network development and increased quality relationships; 2) Access to new partners: access to complementary skills to develop more radical and relevant innovations; 3) New Connections: shared value. Also, there was a plan for implementation of new forms of open innovation for Natura Campus i.e. challenges, open calls and innovation blogs on the website. Plan for the first pilot with consumer co-creation; b) Natura Campus program is disseminated through 164 different channels to search in four different areas: 1) New innovation projects; 2) Sustainable surfactants; 3) Flexible packaging; and 4) insoluble ingredients; c) Natura Campus Program resulted in: Collaboration with 110 external partners; 458 research proposals; 13 approved collaboration projects. Co-Creation program resulted in: 4 co-creation journeys; 9 co-creation meetings; 50 ideas for prototypes; and 2000 people connected</p>	<p>a) The new collaboration with external partners is grounded in four pillars: 1) integrated communication; 2) international reach; 3) embedded in scientific discoveries; 4) multichannel and multi-tool program. In 2012, a new form of collaborating with external partners is launched. This is recognized as co-Creation with Natura which seeks for new collaboration forms with consumers. Finally, a newer version of iQlicar is launched based on three pillars: Evaluation of existing projects; Identification of the innovation Network; and development of established relationships; b) A new version of Natura Campus program and co-creation with Natura are implemented. In its early phase, Co-creation with Natura was divided in three big areas: co-creation 'transparency'; co-creation 'mothers and children'; and co-creation 'what's Brazil'. In 2013, most of the innovation actions were put in place for IQlicar i.e. training, registration, performance evaluation, alignment; c) Results of changes in Natura Campus program are evaluated and new actions to search for external knowledge are put in place. One of the six top priorities of Natura's</p>

		<p>innovation strategy is to be on the edge of Open innovation, accelerating the current initiatives and starting to explore new fields (startups, for example)</p>
	<p>a) Plan to improve the existing form of collaboration with external partners. This collaboration aims to go beyond solving technological problems to combine co-creation, prototyping. Speed up the implementation of ideas through open innovation, creation of initiatives that promote intensive connection among different partners; b) Co-creation with: 1) Researchers from universities; 2) MIT Media Lab; 3) Consumers; 4) existing partners. Development of a proprietary platform for co-creation with consumers (first of this kind in Brazil); c) Results of the Hackaton: 1) 24 institutions; 2) 88 ideas; 8 prototypes developed, 2 students sent to MIT Media Lab, 2 new projects connected to business needs</p>	<p>a) Along with the established open innovation programs. Two new programs to search for external knowledge are designed. These will complement the already connected open innovation programs; b) Based on previous studies the team decides to: 1) maintain existing format of Natura Campus program. It also decided to focus Natura Campus on expanding its connections with different actors, promoting multi-actor co-creation initiatives. For example, Hackathon was an approach to start prototyping challenges promoted by the program; 2) enhance the relevance of co-creation (seeking more connection with business needs and product launch). The results included: more than 5.000 people connected to Natura Campus, more than 2.000 consumers connected to Co-creation with Natura, more than 80.000 people reached through Natura Campus channels, Natura Campus accumulates more than 650 proposals in 8 years; c) a new innovation program is evaluated to deal with start-ups</p>