


OPEN INNOVATION EMERGING CHALLENGES AND PRACTICES IN BRAZIL

Fabio Botelho Josgrilberg^A, Luciana Hashiba^B, Renata Mello^C



ARTICLE INFO	ABSTRACT
<p>Article history:</p> <p>Received 07 April 2023</p> <p>Accepted 07 July 2023</p>	<p>Purpose: The purpose of this paper is to identify the best practices and challenges of innovation management in large companies in Brazil.</p>
<p>Keywords:</p> <p>Communication; Innovation; Management; Open Innovation; Strategy.</p>	<p>Theoretical framework: This paper draws upon recent literature on open innovation, with particular attention to communication processes and challenges. The research adopts Chesbrough's open innovation (OI) definition and develops its argument from Mortara and Minshall's proposal of OI high-level trends (CHESBROUGH; VANHAVERBEKE; WEST, 2006; MORTARA; MINSHAL, 2017).</p>
	<p>Design/Methodology/Approach: The researchers conducted qualitative research of eleven interviews with innovation leaders of big multinational companies. The corpus was submitted to a framework analysis, which allowed for identifying 63 emerging themes, structured in a thematic framework that supported the interpretation procedure.</p>
	<p>Findings: Key findings include the development of five emerging categories of management types, innovation drivers, and communicational dimensions.</p>
	<p>Research, Practical & Social implications: The research draws attention to the impact of complexification in open innovation strategies, and the need for new models of governance, communicative functions, and innovation drivers.</p>
	<p>Originality/Value: The results support the emerging, but yet scarce, literature on open innovation in Brazil, and identify key challenges and emerging practices among Brazilian managers in large companies.</p>
	<p>Doi: https://doi.org/10.26668/businessreview/2023.v8i7.467</p>

INOVAÇÃO ABERTA DESAFIOS E PRÁTICAS EMERGENTES NO BRASIL

RESUMO

Objetivo: O objetivo deste artigo é identificar as melhores práticas e desafios do gerenciamento de inovação em grandes empresas no Brasil.

Quadro teórico: Este documento baseia-se na literatura recente sobre inovação aberta, com particular atenção aos processos e desafios de comunicação. A pesquisa adota a definição de inovação aberta (OI) de Chesbrough e desenvolve seu argumento a partir da proposta de Mortara e Minshall de tendências de alto nível de OI (CHESBROUGH; VANHAVERBEKE; WEST, 2006; MORTARA; MINSHAL, 2017).

Design/Methodologia/Abordagem: Os pesquisadores realizaram pesquisa qualitativa de onze entrevistas com líderes de inovação de grandes empresas multinacionais. O corpus foi submetido a uma análise-quadro, que permitiu a identificação de 63 temas emergentes, estruturados em um marco temático que embasava o procedimento interpretativo.

Descobertas: As principais descobertas incluem o desenvolvimento de cinco categorias emergentes de tipos de gerenciamento, impulsionadores de inovação e dimensões comunicacionais.

^A PhD in Communication Sciences. Associate Researcher. Fundação Getúlio Vargas (FGV). Brazil.

E-mail: fabio.josgrilberg@fgv.br Orcid: <https://orcid.org/0000-0001-9781-2168>

^B PhD in Business Administration. Fundação Getúlio Vargas (FGV). Brazil. E-mail: luciana.hashiba@fgv.br

Orcid: <https://orcid.org/0000-0002-7410-0229>

^C PhD in Education. Universidade Metodista de São Paulo. Brazil. E-mail: renata.mello@metodista.br

Orcid: <https://orcid.org/0000-0002-5031-2454>

Investigação, implicações práticas e sociais: A investigação chama a atenção para o impacto da complexidade nas estratégias de inovação aberta e para a necessidade de novos modelos de governação, funções comunicativas e motores de inovação.

Originalidade/Valor: Os resultados apoiam a literatura emergente, mas ainda escassa, sobre inovação aberta no Brasil, e identificam os principais desafios e práticas emergentes entre os gestores brasileiros em grandes empresas.

Palavras-chave: Comunicação, Inovação, Gestão, Inovação Aberta, Estratégia.

DESAFÍOS DE INNOVACIÓN ABIERTA Y PRÁCTICAS EMERGENTES EN BRASIL

RESUMEN

Propósito: El propósito de este artículo es identificar las mejores prácticas y los desafíos de la gestión de la innovación en las grandes empresas de Brasil.

Marco teórico: Este documento se basa en la literatura reciente sobre innovación abierta, con especial atención a los procesos y desafíos de comunicación. La investigación adopta la definición de innovación abierta (IO) de Chesbrough y desarrolla su argumentación a partir de la propuesta de Mortara y Minshall de tendencias de alto nivel de OI (CHESBROUGH; VANHAVERBEKE; WEST, 2006; MORTARA; MINSHAL, 2017).

Diseño/Metodología/Enfoque: Los investigadores realizaron una investigación cualitativa de once entrevistas con líderes de innovación de grandes empresas multinacionales. El corpus fue sometido a un marco de análisis, que permitió identificar 63 temas emergentes, estructurados en un marco temático que apoyó el procedimiento de interpretación.

Hallazgos: Los hallazgos clave incluyen el desarrollo de cinco categorías emergentes de tipos de gestión, impulsores de innovación y dimensiones comunicacionales.

Investigación, implicaciones prácticas y sociales: La investigación llama la atención sobre el impacto de la complejidad en las estrategias de innovación abierta y la necesidad de nuevos modelos de gobernanza, funciones comunicativas y motores de innovación.

Originalidad/Valor: Los resultados respaldan la literatura emergente, pero aún escasa, sobre innovación abierta en Brasil, e identifican desafíos clave y prácticas emergentes entre los gerentes brasileños en grandes empresas.

Palabras clave: Comunicación, Innovación, Gestión, Innovación Abierta, Estrategia.

INTRODUCTION

This article presents the results of exploratory qualitative research on the innovation management processes and challenges in Brazilian large companies. The researchers conducted a framework analysis based on eleven interviews with innovation leaders of multinational companies operating in Brazil. The research identified 63 emerging themes, gathered in a thematic framework (See Table 5). The thematic framework served as a reference to deepen the analysis that led to three dimensions of interest and to the identification of eight emerging categories that help understand some aspects of open innovation (OI) current state of affairs in Brazil.

The research question was formulated as follows: “Which are the emerging practices in innovation management in Brazil?”. The main research goal was to describe new practices that emerged during the Covid-19 pandemic crisis, which noticeably has forced several process changes in managerial strategies. At a specific level, the investigation seeks to analyze how different communicational aspects impact OI management.

This article adopts the definition of open innovation (OI) as "a paradigm that assumes that companies can and should use external ideas, as well as internal ideas, and internal and external paths to the market, as companies seek to advance their technologies" (CHESBROUGH; VANHAVERBEKE; WEST, 2006). In Brazil, in particular, there is a lack of research on how OI has been practiced (SABINO DE FREITAS et al., 2017; BOGERS; BURCHARTH; CHESBROUGH, 2021), which makes this investigation even more relevant.

THEORETICAL REFERENCES AND PROBLEMATIZATION

Chesbrough's definition was revisited by Mortara and Minshall, who indicated five high-level trends in the implementation of open innovation processes. The first trend refers to the direction of input, such as inside out, coupled or from the outside in. Second, the authors drove attention to what stimulates internal change, namely, if the stimulus was top to bottom or from bottom to top. Then there is a concern about the kind of governance at stake, that is, being decentralized or centralized coordination. The last two referred to who and how a company approaches new potential partners and locations (go to places or come to me) (MORTARA; MINSHAL, 2017, p. 278).

Drawing upon Mortara and Minshall's work, it is possible to establish four key dimensions that stimulated this research:

1. *Knowledge production*, such as knowledge management and creativity.
2. *Organizational culture transformation*, where the false dichotomy between the past and the future can prevail, knowledge silos, political issues, and trust in the process.
3. *Coordinating open* innovation processes to overcome the input phase with discipline and method for the real development of innovative products or services
4. *Networks expansion seeking* to define where and with whom to innovate.

The intensity of knowledge production, organizational transformation, innovation process and network expansion in OI intensify communication flows (idea inputs, innovation pipelines etc). Therefore, complexity also increases, turning innovation management into an even more challenging endeavor.

The complexification of OI management impacts different areas such as governance, key performance indicators, innovation drivers and culture. Research done by Frishamar et al point to the fact that shifts to more open models, digitalization and servitization (product-service solutions) has forced new strategies upon innovation auditing practices (FRISHAMMAR et al., 2019).

The increasing complexity is not always accompanied by the necessary changes in innovation management processes, particularly in what concern organizational hierarchies in Brazil (BOGERS; BURCHARTH; CHESBROUGH, 2021). Borgers et al also indicate that among other organizational aspects, companies have difficulties in adopting open innovation strategies due to their internal communication capacity and knowledge exchange. What is at stake here is what Cohen and Levinthal have defined as the absorptive capacity of the organization (*absorptive capacity*), that is, its capacity to identify the value of external information, absorb it, and use it for commercial purposes of their interest (COHEN; LEVINTHAL, 1990). The importance of absorptive capacity in OI is also highlighted by Flor et al (FLOR; COOPER; OLTRA, 2018)

Almost as paradoxical elements of the same problem, as complexity increases, there is an urgent need to reduce time to market (TTM) of new products and services (PALMIÉ et al., 2016). Within this context, agile frameworks have emerged as an option to increase autonomy, communication flows, responsiveness to changes, and to develop the necessary culture to improve innovation processes, but not without its hurdles in their adaptation to current stage-gate models. Cooper & Sommer identified several challenges such as management skepticism, lack of resources, and fluid product definitions and development plans (COOPER; SOMMER, 2018).

The move towards agile frameworks or some combination of them with stage-gate innovation processes is also sustained by Biachi et al (BIANCHI; MARZI; GUERINI, 2020). Drawing on their research on software development, the authors' findings demonstrate that the professionals surveyed make a strong relation of efficiency and new product development. To some extent, the root cause of better performance is linked to a better adaptation of agile frameworks to uncertainty, as this is often the case with innovation processes.

However, a stumbling block to the emergence of agile frameworks in innovation processes has been organizational culture. To promote and develop OI culture depends on how knowledge is shared within a company. Corporate knowledge sharing is a highly complex matter influenced by diverse aspects such as origin of knowledge, channels used, context and existing knowledge (CETINTAS; OZUPEK, 2012). Again, the communicational complexity of company, as Uziene suggests, impacts directly its capacity to generate social e economic value innovatively (UŽIENĖ, 2015).

The impact of communicative processes on innovation outcomes is also investigated by Dombusch et al who claimed that social, factual and temporal aspects may increase

communicational complexity and influence the company approach to OI (DOBUSCH et al., 2017). For a more detailed approach, one can draw upon Luoma-Aho e Halonen's work who mapped out 8 communicational functions that impact innovation management

1) informing internal stakeholders, 2) informing external stakeholders, 3) communication as a management function, 4) sharing and cross-pollination of ideas, 5) networking and establishing contacts, 6) reputation management, 7) creating organizational culture and 8) maintaining organizational structure (LUOMA-AHO; HALONEN, 2010, p. 10)

This research, as described in the following sections, pays special attention to different aspects that increase complexity in OI innovation management in the view of highly experience managers who have recently worked or working for big multinational companies. What is in question is not only cultural challenges, but also specific management practices that were required to increasing complexity.

As it will be presented in this paper, the concerning communicational aspects within a company was particularly highlighted by the interviewees.

METHODS

The corpus of semi-structured interviews with 11 innovation leaders of large companies operating in Brazil was collected between May and July 2020, amidst the outburst of the Covid 19 pandemic. The interviews amounted to 13.37 hours of recordings, which were transcribed and submitted to a *framework analysis* (RITCHIE; SPENCER, 1994; MATTHEW; MICK, 2018). The interviews were conducted by the project's two main researchers.

A framework analysis must take the following steps (RITCHIE; SPENCER, 1994):

- Familiarization - Prior reading of the corpus and preliminary identification of emerging themes.
- Thematic framework identification - Structuring of emerging themes that will guide the analysis through a deductive process aiming at identifying relevant topics.
- Indexing - Indexing of excerpts from the corpus (interviews) according to the thematic framework identified in the previous step (first reduction of the corpus)
- Charting - Structuring of an analytical and comprehensive framework (second corpus reduction)
- Mapping and Interpretation - Definition of emerging concepts, range of concepts, associations, typologies, and explanations.

A thematic framework is built through a deductive process, where the researchers seek to identify relevant excerpts that may address a specific theme worth of attention. The first themes emerge in the familiarization phase with the corpus originated in the interviews and can be improved throughout the frame structuring process.

After the Familiarization phase, the researchers develop the Thematic Framework which will guide the analysis throughout the research. The thematic framework should reflect the last evaluation made by the researchers.

As an example of a thematic framework, see an excerpt of this research's thematic framework Table 1 bellow (the full thematic framework will be presented in section 3. Results:

Table 1 Thematic framework example

1. Origin of innovation processes within the organization	1.1 Marketing and business development area 1.2 IT Area 1.3 Business areas 1.4 Research & Development
2. External stakeholders involved in the innovation process	2.1 Universities 2.2 Startups 2.3 Partner companies 2.4 Government 2.5 Customer 2.6 Ecosystem facilitators (Accelerators, incubators, and entrepreneurship promotion organizations)

Source: Author

The third phase is the Identification process. With the thematic framework in hand, the researchers go through the corpus again, this time seeking to relate literal excerpts to index defined in the previous phase, as shown in the example bellow.

Table 2 Example of theme identification for the thematic table

EXCERPT FROM THE INTERVIEW	Indexer
It wasn't a pure innovation strategy, it was an adjacencies strategy to accelerate adjacent businesses, but it functioned as a <i>venture building</i> .	12.4. Business model

Source: Author

Following the Identification phase, the researchers proceed to the Charting process. The charting is a second reduction of the corpus, when the researchers offer a more comprehensive evaluation of the themes identified previous phases with their own words and observations. An example of comments made by the researchers during the charting phase can be seen in Table 3. The charting works as a preparation to the Interpretation final phase.

Table 3 Charting

INDEX	INTERVIEWEE	B	B	C	D	E	F	G
	1.1. Marketing and business development	Innovation driver and new business	Separate R&D pipeline	-	-	Seeks to identify consumer needs	Marketing has always been a driver because of the need to cheapen products in Brazil and can lose quality	Marketing area integrated with sustainability and innovation

Source: Author

Finally, in the Interpretation step, the researchers analyze the emergence of possible definitions, range of phenomena, typologies, associations, and elements to be explored.

For instance, this research focused on emerging categories that could contribute to the comprehension of open innovation processes. In this study, a category is understood as the systematization of knowledge about a phenomenon that can be identified, organized, and classified by characteristics that may indicate possible generalizations through further research. Thus, the categories presented here work as intermediate elements between the development of theoretically better-structured concepts and the reality of the phenomenon studied. The formulation of concepts should be the object of future and in-depth theoretical research.

RESULTS

The corpus of semi-structured interviews with 11 innovation leaders of large companies operating in Brazil. The companies' profiles where the professionals worked for can be found in Table 1:

Table 4 Reference companies' profile

	Scope	Sector	Employees in Brazil	Brazilian operation net revenue of US\$
A	multinational	Food and drink	31,000	5,212,808,235.29
B	multinational	Mining, Cement, and Oil	34,658	3,274,509,803.92
C	multinational	Consumer goods	22,000	2,921,568,627.45
D	multinational	Health	116,000	271,960,784.43
E	multinational	Technology	10,000	4,549,019,607.84
F	multinational	Technology	8,200	1,000,000,000.00
G	multinational	Consumer goods	5,109	7,235,294,117.65
H	multinational	Chemistry	1,852	1,021,706,666.67
I	multinational	Pharmaceutical	5,600	396,543,725.49
J	multinational	Chemistry	2,700	882,352,941.18
K	multinational	Consulting services	13,000	730,132,352.94

Source: Author

At the end of steps 1 and 2 (Familiarization and Thematic framework), the following themes emerged:

Table 5 Thematic framework

1. Origin of innovation processes within the organization	<ul style="list-style-type: none"> 1.1 Marketing and business development area 1.2 IT Area 1.3 Business areas 1.4 Research & Development
2. External stakeholders involved in the innovation process	<ul style="list-style-type: none"> 2.1 Universities 2.2 Startups 2.3 Partner companies 2.4 Government 2.5 Customer 2.6 Ecosystem facilitators (Accelerators, incubators, and entrepreneurship promotion organizations)
3. Innovation key performance indicators	<ul style="list-style-type: none"> 3.1 Revenue from new products or services 3.2 Cost reduction 3.3 Return on investment 3.4 Number of projects in the innovation portfolio 3.5 Mortality rate (number of projects terminated before completion) 3.6 Distribution by types and degrees of innovation (radical, incremental, adjacent) 3.7 Number of patents 3.8 Number of products launched to market 3.9 Incentive and external funding laws 3.10 Sufficiency (analysis if there are several projects sufficient to achieve revenue goals with new products or services)
4. Current challenges for improving innovation	<ul style="list-style-type: none"> 4.1 Better and agile innovation processes 4.2 Intrapreneurship culture development 4.3 Development of open innovation processes 4.4 Lack of innovation culture 4.5 Internal communication flows 4.6 Better comprehension of how to work with startups and what to expect from them 4.7 Cancellation of projects which do not have good prospects
5. Communication dimensions in innovation management	<ul style="list-style-type: none"> 5.1 Need for empathy with employees to engage them in the innovation process 5.2 Training as a form of dissemination of knowledge 5.3 Attention to the role of innovation in the reputation of the organization 5.4 Communication of processes and results of innovative projects
6. Leadership	<ul style="list-style-type: none"> 6.1 Active and visible high-level leadership in the innovation promotion is of utmost importance
7. Budget management	<ul style="list-style-type: none"> 7.1 Budget managed by business areas 7.2 Budget managed by product line 7.3 Budget managed by a centralized innovation area or department
8. Top drivers for innovation	<ul style="list-style-type: none"> 8.1 Digital transformation 8.2 COVID pandemic 8.3 Economic crisis 8.4 Market expansion 8.5 Customer behavior 8.6 Definition of new strategic areas 8.7 External financial incentives 8.8 Sustainability 8.9 Cost reduction 8.10 Problem identification

9. Governance model	9.1 Committee/Innovation department with a centralized stage gate 9.2 Matrixial innovation management with multiple parallel stage gates
10. Degree of innovation	10.1 Incremental 10.2 Radical
11. Aspects valued in innovation culture	11.1 Pioneering 11.2 Intrapreneurship 11.3 Appetite for risk 11.4 Long-term vision 11.5 Autonomy 11.6 Flexibility/Agility
12. Types of innovation highlighted	12.1 Goods 12.2 (Internal) Processes 12.3 Services 12.4 Business model 12.5 Software

Source: Author

INTERPRETATION

Following the Familiarization and Thematic Framework phases, the researchers performed the Charting, when the aim is to promote a second reduction in the corpus, by adding their considerations, followed by the Interpretation step, which is presented here.

The interpretation focused on three dimensions:

- Innovation management approach
- Innovation drivers
- Communications processes

The following sections address each dimension in detail.

Innovation Management Approach

Throughout the research, a clear distinction was made between two categories, namely:

- Innovation promotion management (IPM), and
- Innovation support management (ISM).

Innovation promotion management emerged as a theme especially among three interviewees through reports that described the initial efforts to consolidate processes and culture of innovation. In the experiences these professionals went through, the need to convince peers about the need for innovation, the promotion of cultural aspects such as long-term vision, the increased risk taken, agile project management and collaboration with internal and external stakeholders were of great importance. Even some sort of evangelism process was raised by one of the interviewees.

IPM and ISM are not opposite, but complementary. Even in the reports of professionals in more mature organizations in their innovation processes, IPM remains a core activity, what changes is the sophistication of the content and actions promoted, depending on the innovation maturity level.

The *innovation support management*, in turn, seeks to promote greater agility of innovation processes, seeking to remove possible impediments and support them when necessary. The ISM emerges when complexity increases, where there are multiple innovation pipelines.

All professionals interviewed mentioned the use of some variation of stage-gate management (BIANCHI; MARZI; GUERINI, 2020). Variations included the constitution and number of committees or the role of executive innovation leadership, and how portfolio management was performed (COLEY, 2009) What became evident is that, as new inputs and communications flow increase through several innovation pipelines, innovation managers needed to review the process in place.

The key driver for the change in the innovation strategy was the variation between one and many synchronous stage gates. It is possible to perceive a direct relationship between the emergence of the ISM and the complexification of information flows. At least seven reports indicated the need to change the approach when there were multiple innovation pipelines, defined by either business units or strategic areas. In terms of a qualitative approach, it is possible to affirm that this theme has reached its saturation point.

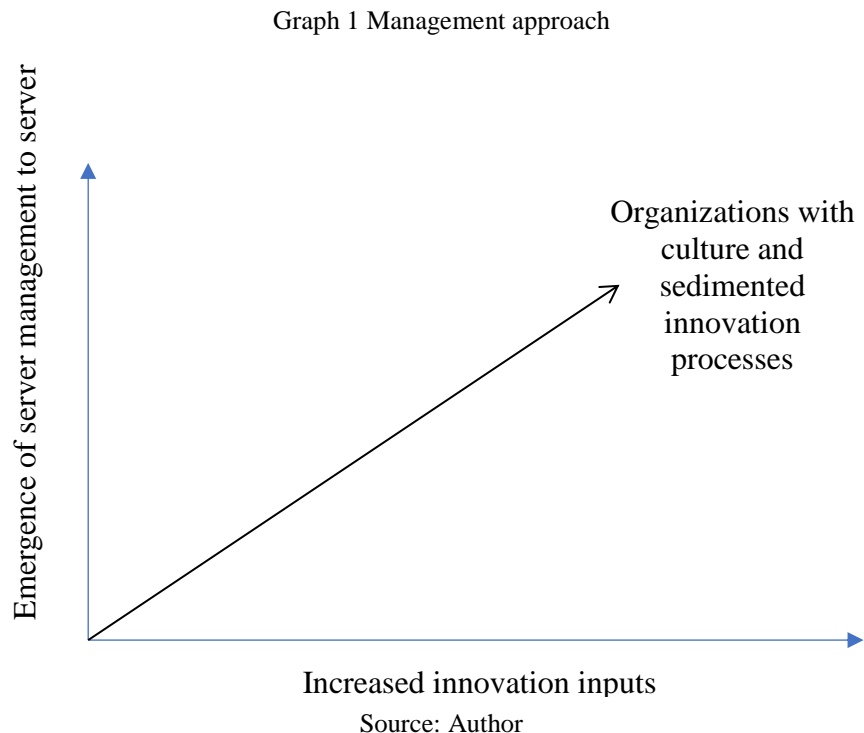
The interviewees highlighted the need to remove bureaucracy to gain agility when working with multiple stage gates. In this new configuration, innovation leaders began to assume a server role to support and facilitate the business units' innovation interests. The complexification of processes and increased inputs in the pipeline required the revision of the management model.

Not only the innovation leaders but also the innovation committees had to assume a leading role, whose objective would be to remove obstacles, seek synergies with other areas of the company, or even offer additional possibilities for financing projects for areas whose budgets have proven insufficient for the development of innovation projects.

An interviewee, from a major company recognized for its innovation capacity worldwide, highlighted changes in the innovation management starting in 2019, and still in progress, to facilitate the process and provide more agility, especially in the initial stages when validating hypotheses for innovative projects and ensuring greater autonomy for the teams. The

changes even included the reporting structure, as the R&D area began to respond to the global CTO and no longer to the local CEO.

Graph 1 exemplifies what may be at stake in ISM development.



Increased complexity and innovation inputs have led to the emergence of decentralized innovation management models. At the limit, one of the interviewees called into question the very need for an area of innovation: “We don't need to strengthen an area of open innovation; we need to end the area of open innovation. For me, companies will be performing open innovation when they don't have an area and yet innovation keeps happening”.

The choice for a management that is a servant to innovation emerged aligned, and not in opposition, with the need to stimulate cultural aspects such as entrepreneurship, autonomy, and flexibility.

As a closing remark to this section, the role of the CEO and the impact of his actions and examples deserve to be highlighted apart. Three interviewees recorded the impact of the company's founder on the entrepreneurial and experimental vision as determinants for organizational culture. At least two interviewees also emphasized the importance of changing the CEO to value the area of innovation, highlighting new cultural elements such as a greater appetite for risk and long-term vision.

Communications Processes

Communication to support innovation was another field that allowed the identification of processes that can be subject to classification. However, if a recurrent theme is to be highlighted, it is the need for intense communication in general, with a varied emphasis on the stakeholders involved.

Thus, it was possible to identify five distinct modalities of communication:

- Empathic communication for innovation.
- Communication to engage high-level executives for innovation.
- Communication to promote space and skills for innovation.
- Communication to manage organizational reputation as an innovative brand.
- Communication with external stakeholders.

Empathic communication refers to the need for promoting processes and culture with particular attention to the employees' context. Two interviewees highlighted the need to talk about innovation from the same semantic horizon of employees as a strategy to promote engagement.

One of the interviewees even gave a caricatural example of the lack of empathy in communication to promote innovation, particularly in companies that have already achieved success or are known for their operational excellence. In his words:

And in general, they are winners because of the people who have been there for decades, who have taken this company there, and suddenly someone comes wearing sneakers, jeans and starts to impose, it must be so, must work with startups ... we're dealing with brilliant people on the other side too and have achieved several things not necessarily using open innovation.

Also, on communication with employees, other themes emerged as important, such as the need for highlighting good examples, and the maintenance of fixed and multidisciplinary teams, which favors the bond and collaboration, besides being attentive to the demands of the areas.

Communication to engage high-level executives relates to the need for first-level executives to visualize what is happening from the point of view of innovation and its results. It is worth mentioning the account of one of the interviewees who emphasized the great turning point for the innovation team within the company. In his words:

There was a very iconic day [...] there was also a specific meeting where we took, for the first time, the indicators about the project portfolio, a view of the project portfolio, etc. Already classified in the development horizons as well. I remember that

leadership when he saw that the area was able to map all projects, classify all projects, and bring a scenario of how the company's innovation was in fact, that I think was the key turning point for the leadership too.

The innovation managers interviewed spend a large amount of time promoting spaces and skills for innovation. The concept of space here is used both in its physical and symbolic dimensions, meaning not only having labs or design rooms available, but also making space in the organization's agenda allowing employees to dedicate time to new projects in a psychologically safe environment to ideate, test, fail, learn, and keep on trying new ways to deliver products and services.

The promotion and development of new organizational skills and spaces to innovate are, to a large extent, one of the main activities performed by the interviewees. This theme has reached a saturation point, a perception held by all the professionals involved in this research. Whether through training, area visits, openness to dialogue, or fostering a safe environment to ideate, prototype, and evaluate new products or services, these managers had to take on the challenge of finding the proper way to communicate with other leaders and employees why and how the organization should engage with innovation processes.

Another dimension of communications processes identified in the research concerns the organization's reputation management as an innovative brand. The most striking account on this subject came from a professional who stated that the purely financial focus on innovation was impacting the brand's reputation as innovative. This required the organization to review its innovation strategy, its indicators, and its alignment with the company's purpose.

Another professional stressed the need for continuous dialogue with the public relations office and leaders to align a public positioning of the brand as innovative. Another executive highlighted the need for a reputation as an innovative organization to attract talent.

The last communicational dimension identified relates to the open innovation process, which can be classified as *communication with external stakeholders*. All interviewees registered some sort of relationship with startups and universities, for instance. However, the perception of one interviewee is of particular interest, that is, the need for maintaining an open and permanent channel with startups, in a complementary way to the challenges launched sporadically.

The permanent channel aimed at avoiding what the interviewee named "stage innovation", meaning that kind of company that promotes innovation challenges just for promoting the brand as innovative, and not really engaging in innovation processes. The

company this interviewee worked for evaluated 828, interacted with 429, tested 14 solutions, and contracted 10 startups only in 2020.

About the strategy of having a permanent communication channel with startups, in progress since 2016, it is worth mentioning the opinion of one interviewee: “The program for us fills the role of ensuring a permanent entry point for those who want to meet us and do not know how [to approach us]”.

All interviewees also valued the relationship with universities. At least two of them stressed that working with the academic world should aim long term projects. Two interviewees who did not mention the relationship with universities registered strong operational or R&D excellence as a limiting factor for open innovation. Other stakeholders, such as government agencies, partner companies, and innovation agents were occasionally mentioned.

Innovation Drivers

The literature specialized in innovation, to a large extent, highlights the *technology push* and the market *pull* as the main drivers of innovative processes in organizations. This classification remains valid, however, throughout the interviews, themes emerged that point to a classification that may be slightly different. At least two other drivers could be identified in the interviews, classified as *environmental pull* and *financial push*.

As *technology push*, themes with digital transformation and industry needs 4.0 have been highlighted. As for market *pull*, references to concern about meeting customer needs and market expansion can be included in this classification.

However, references to the impact of the COVID-19 pandemic as a driver of innovations were recurrent. The need for distancing and adaptation to the home office, which forced organizations to accelerate digitalization processes and review processes, was not a development of the logic of demand and supply of the market or the appearance of some disruptive technology. Rather, it has been an environmental factor that has demanded innovation.

Even the issue of sustainability was mentioned by three interviewees as a driver, both as a market requirement and as an awareness of a *sine qua non condition* of survival of the human species. In this sense, regardless of the immediate demand for sustainable products in the short term, to a large extent, there is a movement of innovation motivated by the recognition that humanity sits on the brink of planetary collapse, allowing for the identification of what can be classified as *environmental pull*.

Although it is not a driver per se, but more of an enabler, one should note how the existence of tax incentives for a multinational corporation operating in Brazil facilitated OI. According to the interviewee, the tax benefits offered by the Brazilian Informatics Law allowed greater R&D autonomy to the Brazilian subsidiary in relation to its headquarters. Otherwise, innovation efforts would remain highly dependent upon the global headquarters.

The origin of innovation processes varied internally. Interviewees indicated the area of marketing and business development, IT, and R&D as common places to originate innovation projects. The variety of internal sources for innovation reinforced the emergence of an innovation support management strategy with multiple stage gates.

CONCLUSION

The framework analysis performed in this research highlighted three dimensions: innovation management models, communications processes, and innovation drivers.

The two innovation categories, namely, innovation promotion management (IPM) and innovation support management (ISM) echo the contribution made by Mortara and Marshal concerning the high-level trend in open innovation (MORTARA; MINSHAL, 2017).

The ISM category exemplifies what Mortara and Marshal have called decentralized coordination. In this type of environment, innovation processes originate in different areas of the organization and even from external drivers. The emergence of ISM is a result of input complexification in the innovation process, requiring managers to review their role, assuming a more servant leadership style that helps address issues impeding innovation, and providing room for more autonomous teams.

This research has shown evidence that should be further explored, that companies beginning to structure their innovation processes, particularly with great operational excellence, opted for more centralized models. The ISM model comes with the evolution and increased innovation culture maturity, which, as Enkel et al suggests, depends on the evolution of a company's climate to innovation, partnership capacity and internal process (ENKEL; BELL; HOGKAMP, 2011)

The categories identified in the communication dimension also dialogue with existing research. Communication to engage high level executives for innovation, to promote space and skills for innovation, to manage organizational reputation as an innovative brand, and with external stakeholders refer, to some extent, to the Luoama-Aho and Haolonen's functions. However, the category "empathic communication for innovation" found out in this research

adds new elements to what they call “communication as a management function” (LUOMA-AHO; HALONEN, 2010).

The empathic communication for innovation calls attention to the improvement of communication strategies in more conservative environments. A caricatural description of one of the interviewees highlights the communicative strategy issue when he reveals that one of the greatest lessons he learned was to figure out that he does not need to communicate presenting himself as the "new" against the "old".

The last findings concern the need for reflecting upon the traditional innovation drivers. The emergence of the new category of *environmental push* has become clear. The literature on innovation traditionally highlights *market pull* or *technology push* as drivers of innovation (LAZERTE, 1989; CARAYANNIS, 2014) . However, the COVID-19 pandemic has put on the agenda an extreme situation that had little to do with technological developments or greater consumer awareness of environmental issues.

The pandemic posed an inevitable sanitary reality. Similarly, climate change and the extreme events experienced throughout the planet call into question current business models, society’s energy matrix and consumption patterns. Innovation, as a means of resilience to climate change, is independent of the will of the market or of emerging technologies in this case. It is rather a matter of the human species’ survival.

REFERENCES

BIANCHI, M.; MARZI, G.; GUERINI, M. Agile, Stage-Gate and their combination: Exploring how they relate to performance in software development. **Journal of Business Research**, v. 110, p. 538–553, 1 mar. 2020.

BOGERS, M.; BURCHARTH, A.; CHESBROUGH, H. Open Innovation in Brazil: Exploring Opportunities and Challenges. **International Journal of Professional Business Review**, v. 6, n. 1, p. 213, 6 jan. 2021. Disponível em: <<http://www.openaccessojbs.com/JBReview/article/view/213>>. Acesso em: 18 jul. 2022.

CARAYANNIS, E. Addressing the Impact of E-Development in the Knowledge Economy and Society: Outputs, Outcomes, and Impacts. In: CARAYANNIS, E. G.; CAMPBELL, D. F. J.; EFTHYMIOPOULOS, M. P. (Ed.). **Cyber-Development, Cyber-Democracy and Cyber-Defense SE - 3**. [s.l.] Springer New York, 2014. p. 91–111.

CETINTAS, H. B.; OZUPEK, M. N. Corporate Knowledge Communication and Knowledge Communication Difficulties. **International Scholarly and Scientific Research & Innovation**, v. 6, n. 4, p. 567–571, 2012.

CHESBROUGH, H.; VANHAVERBEKE, W.; WEST, J. **Open Innovation: Researching a New Paradigm**. Oxford: Oxford University Press, 2006.

COHEN, W. M.; LEVINTHAL, D. A. Absorptive Capacity: A New Perspective on Learning and Innovation. **Administrative Science Quarterly**, v. 35, n. 1, p. 128–152, 1990. Disponível em: <<http://www.jstor.org/stable/2393553>>.

COLEY, S. **Enduring Ideas: The three horizons of growth**. Disponível em: <<https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/enduring-ideas-the-three-horizons-of-growth>>. Acesso em: 23 dez. 2019.

COOPER, R. G.; SOMMER, A. F. Agile–Stage-Gate for Manufacturers: Changing the Way New Products Are Developed Integrating Agile project management methods into a Stage-Gate system offers both opportunities and challenges. **Research Technology Management**, v. 61, n. 2, p. 17–26, 4 mar. 2018.

DOBUSCH, L. et al. A Communication Perspective on Open Strategy and Open Innovation. **Managementforschung**, v. 27, p. 5–25, 31 ago. 2017.

ENKEL, E.; BELL, J.; HOGEKAMP, H. Open Innovation Maturity Framework. **International Journal of Innovation Management**, v. 15, n. 06, p. 1161–1189, 1 dez. 2011. Disponível em: <<https://doi.org/10.1142/S1363919611003696>>.

FLOR, M. L.; COOPER, S. Y.; OLTRA, M. J. External knowledge search, absorptive capacity and radical innovation in high-technology firms. **European Management Journal**, v. 36, n. 2, p. 183–194, 1 abr. 2018. Disponível em: <<https://www.sciencedirect.com/science/article/pii/S0263237317301135>>. Acesso em: 13 ago. 2019.

FRISHAMMAR, J. et al. Opportunities and challenges in the new innovation landscape: Implications for innovation auditing and innovation management. **European Management Journal**, v. 37, n. 2, p. 151–164, 1 abr. 2019.

LAZERTE, J. D. Market Pull/Technology Push. **Research-Technology Management**, v. 32, n. 2, p. 25–29, 1 mar. 1989. Disponível em: <<https://doi.org/10.1080/08956308.1989.11670583>>.

LUOMA-AHO, V.; HALONEN, S. Intangibles and Innovation: The Role of Communication in the Innovation Ecosystem. **Innovation Journalism**, v. 7, n. 2, 2010.

MATTHEW, K.; MICK, H. Framework analysis: a whole paradigm approach. **Qualitative Research Journal**, v. 18, n. 3, p. 248–261, 1 jan. 2018. Disponível em: <<https://doi.org/10.1108/QRJ-D-17-00008>>.

MORTARA, L.; MINSHAL, T. Padrões de implementação de inovação aberta em multinacionais. In: **Novas fronteiras em inovação aberta**. São Paulo: Buscher, 2017. p. 257–276.

PALMIÉ, M. et al. Coordination mechanisms for international innovation in SMEs: effects on time-to-market and R&D task complexity as a moderator. **Small Business Economics**, v. 46, n. 2, p. 273–294, 2016. Disponível em: <<https://doi.org/10.1007/s11187-015-9683-8>>.

RITCHIE, J.; SPENCER, L. Qualitative data analysis for applied policy research. In: BYRMAN, A.; BURGESS, R. G. (Ed.). **Analysing Qualitative Data**. London: Routledge,

1994. p. 173–194.

SABINO DE FREITAS, A. et al. Inovação Aberta Nas Empresas Brasileiras: Uma Análise Da Produção Acadêmica No Período De 2003 A 2016. **Revista Ibero Americana de Estratégia**, v. 16, n. 3, p. 22–38, 6 maio 2017. Disponível em: <<https://www.redalyc.org/articulo.oa?id=331252606003>>.

UŽIENĖ, L. Open Innovation, Knowledge Flows and Intellectual Capital. **Procedia - Social and Behavioral Sciences**, v. 213, p. 1057–1062, 2015. Disponível em: <www.sciencedirect.com>. Acesso em: 29 abr. 2019.