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The role of the organizational and operational dimensions in the open collaboration performance: a strategic alignment perspective

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Abstract

Purpose – The purpose of this paper is to investigate how the business model and the strategic intent to adopt an open collaboration initiative influence the perceived quality of collaboration outcomes.

Design/methodology/approach – This paper presents a framework to analyze the role of the strategic dimension and the operational dimension in open collaboration initiatives through multiple case studies in three companies to understand how the open collaboration initiative was deployed and how was the level of the alignment between these two dimensions.

Findings – The studied cases revealed that when an open collaboration initiative starts in the strategic dimension and there is an alignment between the organizational dimension and operational dimension, the collaboration outcomes are clearer and more traceable.

Research limitations/implications – The study highlights the need to consider the involvement and the internal alignment between strategic and operational dimensions when deploying an open collaboration activity if they want to achieve all the benefits.

Practical implications – The presented framework can help managers to evaluate and understand how open collaboration activities are deployed within the company.

Social implications – The study shows that when an open collaboration initiative is planned, its results and benefits can be extended to local communities by developing them.

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Originality/value – This study aims to analyze the open collaboration initiative's contribution to the overall organizational performance through the alignment between the organizational dimension and operational dimension perspective.

Keywords Open collaboration, Innovation, Organizational performance, Strategic alignment

Paper type Research paper

Introduction

Open innovation (OI), since its appearance in 2003 (Chesbrough, 2003a, 2003b, 2003c), has been adopted by several companies as a way to increase their internal innovation capability by combining external and internal knowledge (Carmona-Lavado, Cuevas-Rodriguez, Cabello-Medina, & Fedriani, 2021; Huizingh, 2011). New technologies such as social media and other digital technologies such as Internet of Things, artificial intelligence and analytics have gained attention as an efficient means to implement and manage OI capabilities in a complex and dynamic environment (Marshall, Dencik, & Singh, 2021) and foster the collective knowledge and facilitate the collaboration among participants (Barlatier & Josserand, 2018; Bhatti, Santoro, Sarwar, & Pellicelli, 2020; Chae, McHaney, & Sheu, 2020; Faraj, Jarvenpaa, & Majchrzak, 2011; Marshall et al., 2021; Mention, Barlatier, & Josserand, 2019; Urbinati, Chiaroni, Chiesa, & Frattini, 2020).

Some authors have presented the concept of open collaboration as a complement to OI. According to Levine and Prietula (2014, p. 1416), the definition of open collaboration captures multiple instances and can be defined "as any system of innovation or production that relies on goal-oriented yet loosely coordinated participants." Levine and Prietula (2014) argue that open collaboration performs well and is viable and can expand into new domains. But a more global and organizational view of the benefits of open collaboration is still lacking.

Previous studies have pointed positive impact of open collaboration on an organization's performance such as the quality and nature of collaboration (Nosek & McManus, 2008); the ability to create mechanisms to identify and appropriate external knowledge both in a structured way (Chesbrough, 2003a, 2003b, 2003c, 2006; Chudoba, Wynn, Lu, & Watson-Manheim, 2005; Phillips, 2011) or in an unstructured and loosely way (Levine & Prietula, 2014; Culnan, McHugh, & Zubillaga, 2010); the alignment among the collaborative network that will enhance the strategic role of information technology (IT); and the ability to match different organizational cultures, knowledge and needs (Luftman, Ben-Zvi, Dwivedi, & Rigoni, 2010; Tafti, Abdolvand, & Harandi, 2019).

According to Cheng and Huizingh (2014), intangible factors such as the generation of new ideas, learning, knowledge construction and gains in skills and competencies should also be considered when evaluating open collaboration results. However, Barrows and Neely (2011) cite that these intangible factors are easier to identify when there is:

- a business model that considers the organizational alignment;
- a clear path about how and where decisions regarding projects are taken; and
- the organization's strategic orientation and the intention to adopt open collaboration for innovation is clear.

The alignment between business and IT domain, considering the internal and external environment (Henderson & Venkatraman, 1993; Luftman et al., 2010), is present in the mentioned points, arising the following research question:

RQ1. How does the strategic alignment between strategy and IT influences open collaboration performance?

In a study conducted by Tafti et al. (2019), the key factors that foster strategic alignment in collaborative networks focused on innovation were investigated. However, as mentioned by Cui, Ye, Teo, and Li (2015), there is a lack of a better understanding of how the alignment between IT and business strategy impacts organizational open collaboration performance. In this sense, positive impacts of the IT-enabled functionalities in a collaboration initiative will depend on the way IT expertise and resources are used and aligned with the company's business strategy (Moreno, Cavazotte, & Arruda, 2013; Tafti et al., 2019; Tallon & Pinsonneault, 2011). The importance and the way of achieving alignment between IT and business strategy were discussed in the work of Henderson and Venkatraman (1993) and Luftman, Lewis, and Oldach (1993).

Based on the studies conducted by Barrows and Neely (2011), Cheng and Huizingh (2014) and Luftman et al. (2010), the present work assumes that the quality of the collaboration results depends on how this initiative started within the companies and aims to understand how the business model and the strategic intent to adopt an open collaboration initiative influence the perceived quality of collaboration outcomes. To achieve these aims, a case study was conducted in three different companies operating in distinct industries to investigate the presented purposes.

Theory foundation

Defining open collaboration

Although open collaboration's concept has its foundation in open-source software principles, it can be defined as a set of patterns that foster innovation and production whose goals may range from searching for new ideas to the production and marketing of a new product or technology brought by different means (Dodgson, Gann, & Salter, 2006; Levine & Prietula, 2014) and its strengthening can be attributed to factors such as the influence of social and economic changes, which are reflected in the behavioral changes in today's professionals (Chesbrough, 2003b, 2003c; Dahlander & Gann, 2010).

Many benefits are related to open collaboration; however, results may vary depending on the context, or how the open collaboration process is deployed (Corvello, Steiber, & Alänge, 2021; Huizingh, 2011). Some disadvantages related to open collaboration are also mentioned in the literature, such as the uncontrolled spillover of the innovation outcomes, increased complexity and managerial costs and loss of control regarding intellectual capital (Manzini, Lazzarotti, & Pellegrini, 2017). Risks related to misaligned interests, the "Not Invented Here" (NIH) syndrome among internal R&D teams and the arising of conflicting interests among collaboration network participants are some of the problems cited in the literature (Shaikh & Randhawa, 2022; Tafti et al., 2019).

There are also different ways to deploy open collaboration. According to Phillips (2011), the following questions should be considered: who will be selected to participate in the project; how these participants will be invited; and what role will the participants play. These questions are the base for four possible ways to deploy an open collaboration and it depends on the level of information/instructions given to the participants, how they are invited and also the expected level of contribution.

Information technology role in collaboration and the importance of the strategic alignment

Most open collaboration activities take place within virtual communities (Aron, 2009; Nambisan, 2002; Mohanbir Sawhney, Prandelli, & Verona, 2003) where the internal and external environments are integrated through some IT resources (Dodgson et al., 2006).

Open collaboration requires a set of technological tools that allow customers to interact with companies or to create and configure their products. IT is the means to integrate problem solvers and creators of new ideas from the external environment through their websites or collaborative platforms (Gassmann, Enkel, & Chesbrough, 2010); to enable communication between peers in a virtual environment (Bjørn & Ngwenyama, 2009; Watson-Manheim, Chudoba, & Crowston, 2002); to provide new dynamic forms of collaboration (Aron, 2009; Mohanbir Sawhney et al., 2003); to enable a virtual team integration (Zigurs & Khazanchi, 2008); and to allow customers to become a co-creator (Dodgson et al., 2006; Piller & Walcher, 2006).

However, the depth and extent of how organizations will realize the benefits of the IT-enabled functionalities in a collaboration initiative will depend on the way IT expertise and resources are used and aligned with the company's business strategy (Moreno et al., 2013; Tafti et al., 2019; Tallon & Pinsonneault, 2011). The discussion about importance of the alignment between IT and business strategy was first discussed in the work of Henderson and Venkatraman (1993) and Luftman et al. (1993). They state that within an organization, there are two dimensions – the Business and IT dimensions – and both have an external and internal scope. When there is a movement to integrate the business and IT dimensions, it is called "functional integration." And when trying to align the external and internal environment, both in the business and IT dimensions, it is called strategic fit. In the external scope, both business and IT are more focused on the strategic role, and in the internal scope, the focus is on the operationalization of the internal infrastructure to support the external strategy. Later, Luftman et al. (2010) presented a strategic alignment maturity model that combines six IT/business strategy alignment components: communications, value measurements, IT governance, partnership, IT/scope, architecture and skills.

Evaluating the open collaboration performance

Although some issues could arise from the open collaboration practice, as stated by Manzini et al. (2017) and Shaikh and Randhawa (2022) among others, many outcomes can be used to measure open collaboration performance. Among these outcomes cited in the literature are the ability to obtain better inputs from external consumers (Linus Dahlander & Piezunka, 2014); improvements in R&D results (Chiesa, Frattini, Lazzarotti, & Manzini, 2009; Kumar, Gordon, & Srinivasan, 2011; Lichtenthaler, 2009); improvements in perceived customer satisfaction (Chesbrough, 2011); better business outcomes in terms of profitability (Chiang & Hung, 2010; Lichtenthaler, 2009); a way to overcome the organizational inertia that hinders organizational and business model changes (Huang, Lai, Lin, & Chen, 2013); enhance the cooperation with third parties (Chesbrough & Prencipe, 2008); commercialization of external technologies (Ulrich Lichtenthaler, Ernst, & Hoegl, 2010); access to heterogeneous knowledge through crowdsourcing mechanisms (Malhotra & Majchrzak, 2019) and co-creation with clients (Fang, Palmatier, & Evans, 2008).

The purpose and reasons to adopt an open collaboration approach should be considered if a more integrated view of the open collaboration benefits is pursued (Gaule, 2011). Among the purpose and reasons are leadership and learning; access to new markets and business models (Chesbrough, Vanhaverbeke, & West, 2006; Enkel, Gassmann, & Chesbrough, 2009; Hung & Chou, 2013; Ritter & Gemünden, 2003; Spithoven, Clarysse, & Knockaert, 2011); or reducing costs, time and risk (Piller & Ihl, 2009; Simoes-Brown & Hardwood, 2011; Thomke, 2003). All these presented points require a very active role from the management team (Chesbrough & Brunswicker, 2014), which must establish what level of information should be obtained and made available and is directly related to the definition of the target

audience, the level of collaboration expected and the ultimate purpose (Laursen & Salter, 2014; Piller & Ihl, 2009).

In the operational dimension, there are questions such as how the collaboration activity will be deployed, which typology and IT architecture will be used (Brabham, 2008, 2013; Phillips, 2011), which resources or who will be leading the initiative (an internal team or with a partner).

To measure the impacts on organizational performance, the metrics mentioned by Smith (2005) and Cheng and Huizingh (2014) – the ability to learn and innovate, to build new knowledge and a consistent and perceived improvement in skills and internal competencies – can be adopted.

Research propositions

Based on the reviewed literature and assuming that the deployment of open collaboration has two decision dimensions that must be aligned – an organizational dimension, which is guided by strategic decisions about the purpose of the open collaboration activity, and an operational dimension, which involves more tactical aspects, the following propositions are presented:

P1. Open collaboration activity's results are better perceived when there is a clearly defined strategic direction, in which the open collaboration is an integral part of strategic decisions, with clear objectives and definitions on how collaborators will participate in the task (Brabham, 2008; Cheng & Huizingh, 2014; Simoes-Brown & Hardwood, 2011).

P2. Open collaboration activities need an IT infrastructure to be deployed and the overall results from collaboration and its impacts on organizational performance can be more easily measured in companies where IT plays a strategic role and the alignment between business and IT strategy can be observed (Henderson & Venkatraman, 1993; Nolan & McFarlan, 2005).

P3. Open collaboration outcomes and their contribution to organizational performance are better perceived when it is part of strategic decisions and there are clear metrics, including tangible and intangible factors (Cheng & Huizingh, 2014; Chesbrough & Brunswicker, 2014; Gaule, 2011).

Methodological approach

The methodological approach adopted for this research was qualitative and was implemented through a case study on three companies operating in different industries. Case studies are a suitable choice when the idea is to create a general understanding of one phenomenon that is within a context (Eisenhardt, 1989; Yin, 2005). Case studies are recommended when the research question starts with "how" or "why," which indicates the need to deepen the understanding of one phenomenon. The research question for this research is "how does the strategic alignment between strategy and IT influences open collaboration performance," which leads to qualitative research. The criteria to select the companies to be part of these studies included companies that have an active open collaboration activity being deployed by some IT means. Initially, 30 companies were identified that met this requirement. At least one contact who belonged to the innovation, R&D or technology areas was identified through the LinkedIn platform in these companies. From these first 30 companies, 15 were selected to make a phone or e-mail

contact. Of these 15 companies, the case study was conducted in 5 of them, but only 3 of them attended to all the requirements for this research. The interviews were conducted with the open collaboration activities responsible and each interview lasted 90 min on average.

The research protocol was designed for multiple cases and contained a semi-structured questionnaire, general procedures, guidelines, reminders and rules to be followed during the survey (Miguel, 2010; Sousa, 2000; Voss, Tsikriktsis, & Frohlich, 2002). The collection areas were divided into five blocks:

(1) context of the company;
(2) understanding of the practice of open collaboration;
(3) evaluation of the practice of open collaboration;
(4) assessment of technological resources involved in open collaboration; and
(5) evaluation of the impact of collaboration on organizational performance.

To analyze the results, a coding process based on the research constructs (collaboration, technology and performance) was created as a way to reduce collected data (Miguel, 2010; Yin, 2005) (Table 1).

Case discussion

The characterization of the open collaboration activity for each of the studied companies is available in the Supplementary files.

Company A description

Company A is a Brazilian large construction company, with revenues of approximately US $130m, present in the market for over 60 years. It is known for its pioneering role in the

Constructs	Main aspects	Related proposition	Authors
Collaboration	Strategic direction Decisions about open collaboration goals Top management involvement Role of the participants	P1	Gaule (2011), Barrows & Neely (2011); Chesbrough & Brunswicker (2014), Phillips (2011); Laursen & Salter (2014), Piller & Ihl (2009)
Technology	Technology typology, architecture and/or platform to support open collaboration activity Existence of alignment between IT and strategy IT role in the company	P2	Phillips (2011), Brabham (2008); Brabham (2013), Cui et al. (2015); Grover & Saeed (2007); Rai et al. (2006); Rai et al. (2012); Nolan & McFarlan (2005); Gassmann (2006); Gassmann et al. (2010)
Performance	Gains in leadership and learning Access to new markets and business models Reduction on costs, time and risk Top management involvement	P3	Smith (2005), Cheng & Huizingh (2014); Chesbrough et al. (2006), Spithoven et al. (2011); Chesbrough et al. (2006), Enkel et al. (2009); Hung & Chou (2013); Ritter & Gemünden (2003); Spithoven et al. (2011), Piller & Ihl (2009); Simoes-Brown & Hardwood (2011); Thomke (2003), Chesbrough & Brunswicker (2014)

Table 1.
Constructs & relation with the research propositions

industry and was the first company to launch a collaborative building design through Facebook in 2011, enabling consumers to participate by sharing their ideas for the creation of a new residential building concept and design. Ideas based on sustainability (use of material, processes and construction methods based on the concept of sustainability), apartment designs, use of common spaces and the use of technologies aimed at optimizing energy, consumption and offering facilities to the residents were encouraged.

The open collaboration project was a marketing department initiative, and the main objective was to create awareness in the market. The chosen collaboration platform was Facebook, mainly because it is easier and funnier for the participants. There was not any effort in terms of designing a new platform to offer collaboration and the IT role in the company is mainly to ensure operational efficiency in administrative activities.

Regarding results, the company reported that they received more than 3,000 ideas (10% of them feasible), an increase of 42% in buying intention and an increase of 34% in the perception of the company (awareness). However, once there was no previous planning about how these results would help in the company's strategy, it was not used to preprare the company for future plans and there was no perceived gains in terms of cost or risk reduction, achievement of new markets, business model, leadership or learning.

Company B description

Company B operates in the personal care and cosmetics industry, with revenues of approximately US$2.3bn, and has been established for over 40 years. It is currently one of the largest Brazilian companies in this sector, with over 7,000 employees, and is known as a reference in sustainable business in the country. Innovation initiatives are part of the company's strategy and actively seek ways to innovate in all aspects – in product development, production, internal processes and as a business model. In this process, the company has always sought to involve not only consumers but also researchers, research institutions and local communities.

Since 2001, the company has been involved in small initiatives involving external agents, but it was in 2006 that the company officially launched its first open collaboration program, inviting external researchers and research institutions to engage in new product development, new ideas generation and problem-solving. To launch this program, a collaboration platform was developed. In 2013, the company launched a new type of open collaboration program to foster the co-creation of new products with consumers in general. By 2014, more than eight challenges had been introduced, involving more than 2,000 participants. In 2015, the collaboration platform evolved into a completely open one, where problems are posted and anyone could register to send solutions.

IT is strategic for the company and its Vice President (VP) is responsible for technology and innovation. The company understands that new technologies can create new business needs and models and allow them to go further, reach new markets and innovate in products and processes. There is an alignment between strategic decisions and technological decisions that ensure the quality of their innovation process. Among the good results are the gains in leadership and learning; access to new markets and business models; reduction in costs, time and risk; and the top management is always involved in the innovation process. These results are shown in the company's financial balance, which reflects not only the traditional measurements but their responsibility for sustainability.

Company C description

Company C is a multinational chemical corporation operating in over 36 countries with over 50,000 employees. This company operates in Brazil for more than 50 years, with revenues of

approximately US$2.2bn (global revenues of US$58bn). Company C's operations are business to business, so assessing the end customer needs and trends is a huge internal effort for them. In 2007, the company created an innovation group in the Brazilian subsidiary, and through open collaboration projects that include partners, clients, non-government organizations, suppliers, universities and government, it envisions the main market and society needs that guide its internal and future efforts.

The open collaboration strategy was adopted as part of the R&D department, motivated by the perspective of the benefits that the initiative could bring, mainly in the access of the final consumer needs. Collaboration enables the creation and internalization of innovative ideas, which, after risk and financial analysis, can be transformed into projects, products and business models, providing market differentiation and improved performance and satisfaction of those involved (increased sales to third parties, greater brand awareness, etc.).

Technology is an important part of their strategy and makes intense use of it and they are constantly searching for new technology that can support their strategy. Specifically for open collaboration initiatives, IT started to play a more active role only in 2013 when they decided to work with an innovation accelerator that provided the collaboration platform to launch an open collaboration contest aiming to reach graduation students, young entrepreneurs and research institutions. Since then, they started several open collaboration initiatives, all of them aiming to find sustainable solutions such as packages that do not harm the environment. The collaboration model included an intense interaction between the company's researchers, designers, product and process managers, and external agents, promoting gains in knowledge and reduction of risks and costs.

The results of the open collaboration actions were always tracked and received a clear measurement process. For all the initiatives, they establish a clear purpose, metrics, time frame to convert ideas into solutions and measurement indicators to follow the results, including results in final consumers.

Analysis and results

Building upon data collected from the interviews, we present an open collaboration framework (Figure 1); a comparative table for the main constructs among the cases (Table 2); and an assessment of the research propositions (Table 3).

Henderson & Venkatraman (1993) state that there are two dimensions – business and IT dimensions – that should be aligned. However, as a result of the research, we present three decision dimensions, and the way they are aligned influences the open collaboration outcomes. The first dimension comprises all the organizational strategic dimensions and decisions about the open collaboration initiative. The second dimension is more related to operational aspects and decisions are taken here to emphasize the way an open collaboration initiative will be executed. The third and last dimension is responsible to track the results of the open collaboration initiative. Some results can be directly observed but others are indirect such as gain in knowledge, leadership and preparation for the future that they are perceived only if there is an intention to identify and collect them and it occurs when there is a strategic intention to it (Figure 1).

Decisions regarding adopting or not an open collaboration initiative can be aligned with the organizational strategy or be an isolated initiative. At Company A, it was a marketing decision not aligned with the overall company's strategy. However, when decisions are made in the strategic dimension and go through all the decision process – decision points 1 and 2 – where evaluation and execution criteria are discussed, there is a higher possibility that indirect results from the initiative will be observed and, therefore, having impacts in the organization overall performance (Barrows & Neely, 2011; Chesbrough & Brunswicker,

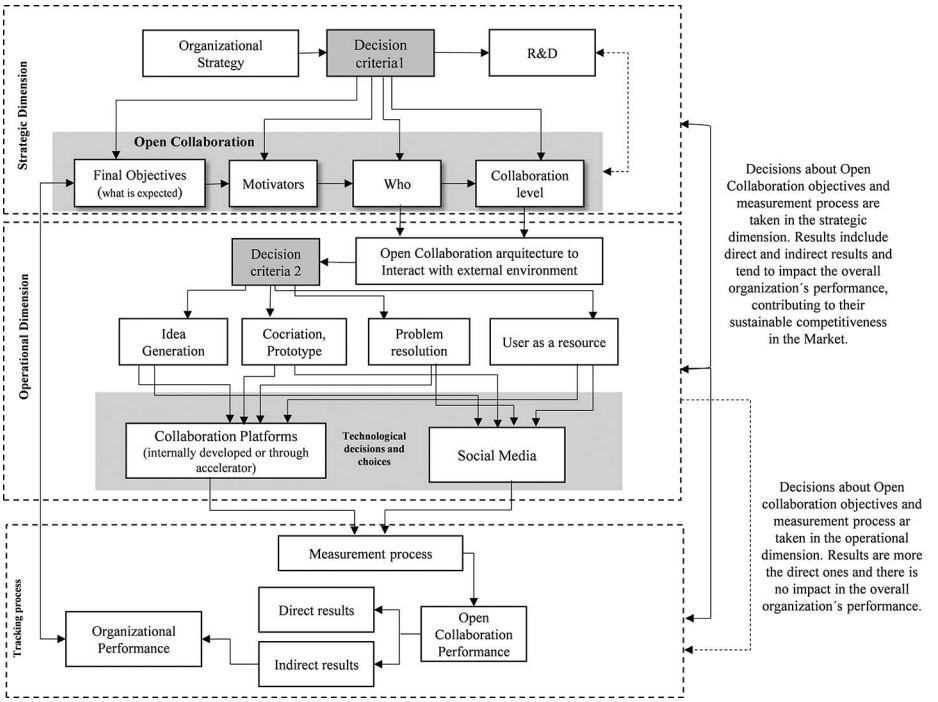

Figure 1.
Open collaboration decision framework

Source: The authors

2014). Table 3 highlights the most important factors observed in the case studies, stratified by the constructs.

Research proposition P1 states that open collaboration results are better when there is a clearly defined strategic direction to it and it is aligned among different departments (Brabham, 2008; Cheng & Huizingh, 2014; Simoes-Brown & Hardwood, 2011). However, when these strategic direction and alignment are not observed, the open collaboration results tend to be only the direct ones that seem to have little impact on the organization's overall performance, mainly because there is not a clear path to make these outcomes enter in the feedback loop to help to redesign further the open collaboration strategies. This point is observed in Company A, that despite the good direct results, they did not convert them into plans for the future of the company, development of new materials or changes in business models. But on the contrary, in Company B and Company C, the involvement of the strategic dimension in the definition of the open collaboration initiative directed their plans.

P2 states the importance of IT in the open collaboration initiative as well as the presence of alignment between IT and organizational strategy (Henderson & Venkatraman, 1993; Nolan & McFarlan, 2005). Although in Company A there is no evidence of the alignment between IT and business strategy, it was observed that IT plays an important role in all three studied companies. For Company A, IT was a facilitator to integrate consumers and the company; in Company B, technology was always seen as the enabler of collaboration; and in Company C, technology helped them to collect and share solutions for sustainability problems that could be solved using their products.

Table 2.
Comparative among the cases

Constructs	Main aspects	Analysis for each case study Company A	Company B	Company C
Collaboration	Strategic direction	No presence of strategic direction	Very strong presence of strategic direction	Strong presence of strategic direction
	Decisions about open collaboration goals	Focused in increasing awareness in the market	Aligned with organizaton's growth strategy. Desire to speed up the reach for new technologies, knowledge and market	Aligned and deployed to fill the gap about the final consumer needs. Ideas for sustainable growth
	Top management involvement	Involvement of the marketing and sales departments only	Involvement of all the board of directors	Involvement of the board of directors, with special attention to the R&D, technology and innovation departments
	Role of the participants	Idea generation. There is no type of commitment or further engagement in other initiatives	Strong level of collaboration. Disclosure of information and high level of commitment and further engagement	Deep level of collaboration. Disclosure of information and plans. High level of commitment and further engagement
Technology	Technology typology, architecture and/or platform to support open collaboration activity	Facebook, mainly to idea generation. Open to overall public	Customized collaboration platform developed to attend to their objectives and needs. Selected participation, with specific objectives	Selected participation with specific objectives. Invitation to participation done by personal contact and use of technology as a facilitator. Later, adoption of a partner's platform to collaborate with universities and young entrepreneurs
	Existence of alignment between IT and strategy	Not observed	IT and business strategy are aligned. There is a technology and innovation VP	IT and business strategy are aligned; however, for open collaboration, activities are in an intermediate stage
	IT role in the company	To support the operation efficiency	Technology is a vital part for their growth strategy in the whole company	Technology is a key part for their R&D
Performance	Gains in leadership and learning	Not observed	Many of their growth and business innovation are based on the learning from the collaborative experiences	They strongly relay in the collaboration perspectives. It is from these experiences that they learn about the final customer needs and are able to make long-time planning for their products and services
	Access to new markets and business models	Not observed	Through the learning obtained from the collaboration activities, the companies are able to constantly innovate in their products and business models	Through the learning obtained from the collaboration activities, the companies are able to constantly innovate in their products and business models
	Reduction on costs, time and risk	Not observed	One of the key collaboration initiatives is the quick prototyping initiatives where participants are invited to create new product, packages or even business models and go until the prototyping stage – all in a very short time span	Once specific needs are identified and partners and customers engaged in the process, the risk of developing something that will not be accepted in the market is low. Also, the time to market is shortened by this process
	Top management involvement	Not observed	Top management is involved in the whole process	Top management is involved in the decision about what actions should be taken
Results	Open collaboration direct results	Yes	Yes	Yes
	Open collaboration indirect results	No	Yes	Yes

Table 3.
Analysis of the research propositions

Proposition	Analysis	Results
P1	The proposition is positively confirmed in Companies B and C. At Company A, it is partially confirmed	Confirmed
P2	The proposition is positively confirmed in Companies B and C. At Company A, it is confirmed by its absence – the fact that the role of IT at Company A and the absence of any kind of alignment between IT and business contributed to the low quality of the open collaboration results	Confirmed
P3	The proposition is positively confirmed in Companies B and C. At Company A, it is confirmed by its absence – once open collaboration was not part of strategic decision, summed to the absence of what is stated in P2, they were not able to identify the intangible results, nor did they use them in their plans	Confirmed

The last proposition, P3, states that open collaboration results will impact an organization's overall performance when there are tangible and intangible factors. The intangible factors are those that will ensure long-term competitiveness, sustainable growth, leadership, gains in knowledge and long-term planning (Cheng & Huizingh, 2014; Chesbrough & Brunswicker, 2014; Gaule, 2011). However, intangible factors can be collected when it is part of the strategic decisions. At Company A, this stage was not observed. Their main objective was to enhance awareness in the market and there is no evidence that the results were used later in other companies' areas. Company B has innovation and collaboration as a central part of its strategy and the company has a feedback process to learn from collaboration and use them to drive its business model. Company C also has a clear measuring process established. They track all open collaboration ideas and those that are converted into products have an initial time frame of five years to start to present results. Once their open collaboration model is more focused, almost all the ideas presented and discussed are used to enhance and strengthen the company. Table 3 presents the final analysis of the three propositions.

Research and managerial implications

The results of open collaboration are better perceived if there is an alignment between open collaboration initiatives and the organization's strategic goals initiatives (Luftman et al., 2010; Tafti et al., 2019). In addition to it, the research propositions helped to understand how the decision influences the quality of the collaboration. Some of the challenges identified in the cases are how companies should establish a process to measure the collaboration results, the parameters they should choose, how they should structure the initiative, what should be the process and how and what dimensions should be measured. Although the results of this research cannot be considered conclusive, the following theoretical and practical contributions can be made.

Theoretical contribution

The discussion based on open collaboration and strategic alignment was the basis for structuring the open collaboration decision framework highlighting three main decision dimensions that influence the direct results of open collaboration and its impact on the overall organization performance.

A previous study presented by Tafti et al. (2019) focuses on the alignment model for collaborative OI networks. However, studies discussing how an organization's internal infrastructure should be projected to ensure the alignment process in an open collaboration

initiative are sparse. The present study sought to fill this gap. The open collaboration framework presented here shows how the decision process for open collaboration adoption should be deployed and how its outcomes will be measured. At first glance, this point seems indisputable, but what was observed in the case studies is that open collaboration is often seen as a marketing and HR initiative and not related to organizational strategy.

The development of a framework from which processes, techniques, methods and tools for organizational models may be created, as well as the development of methodologies for organizational design for open collaboration, constitute the study's contribution. The "framework" developed has an approach centered on "form," that is, it deals with the structural aspects of organizational systems. This approach will allow, in future works, the development of studies of a normative nature concerning organizational systems. The development of the strategy–structure relationship is also being worked on, through an approach considering the existence of three main decision dimensions that influence the results of open collaboration and its impact on the overall organization's performance.

Practical contribution

Measure and tracking the open collaboration initiative's results are one of the big challenges for companies, especially when considering intangible factors. The presented open collaboration decision framework combined with the research constructs and its measurement topics can help managers to evaluate and understand how the open collaboration activities are deployed within the company.

It is known since Henderson & Venkatraman's (1993) work that there is business and IT dimensions and an external and internal environment that have to be aligned to achieve better results from the IT resources. This concept was transposed to the open collaboration decision framework where a third dimension was included – the tracking process – that evidentiates what are the measurement process that should be taken and what will be measured as outcomes from the open collaboration initiative. This framework helps managers evaluate if the initiative discussed has an alignment between strategy and operational dimensions.

Limitations and recommendations for future work

A limitation of this study is that it is based on a case study performed in only three companies; therefore, it is not possible to generalize the results. Another limitation is that the study focused on the internal organizational process, not looking at the collaboration network. Phillips (2011) presents four types of open collaboration architecture, each one with a specific goal and strategy. The present study did not deepen these architectures, but future studies could focus on a more in-depth analysis of each of the types of open collaboration and enhance the set of indicators and procedures to measure them. Studies about how technology can enhance open collaboration by identifying specifications and functionalities of collaboration that are enabled by IT to be incorporated into collaborative platforms are also a future path.

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Supplementary material

The supplementary material for this article can be found online.

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