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ARTICLE

Guidelines for Implementing Innovations in Hospital Organizations

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ABSTRACT

This article presents an approach on the theory of innovation in services and aims to propose a set of guidelines to support management during the implementation of innovations in hospital organizations. A case study was carried out with two hospitals in the northeastern region of Brazil to seek an answer to the following research question: What guidelines can be proposed to support management during the process of implementing innovations in hospital organizations? The collected data were treated with content analysis techniques with the aid of the Atlas.ti software. As a result, it was possible to structure a set of guidelines composed of five stages, capable of supporting the management team during the process of implementing innovations in hospital organizations. The proposed guidelines indicate that to implement innovations, the hospital must **arouse** to the need to innovate, **learn** to innovate, **reconfigure** the environment, **implement** innovations and **monitor** results. The article adds academic contributions by exploring the theory of innovation and associating it with the service sector. It presents managerial contributions by proposing a set of guidelines for the implementation of innovations in hospital organizations. Finally, the article presents its limitations and recommendations for future research.

KEYWORDS

Guidelines, Implementation, Innovation, Hospital Environments, Hospital

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1. INTRODUCTION

The first records on the use of the term innovation date from the end of the 19th century, although the innovation management process has only started to occupy a prominent place in the literature in the beginning of the 20th century when Schumpeter highlighted the importance of companies "creating new products to outperform the competition and stand out in the market" (Śledzik, 2013 p.3). Already in the 1980s Drucker (1986) pointed out that innovation could contribute to the way companies manage their resources. Years later, Hamel (2000) pointed out that, due to the innovation process, companies needed to reinvent themselves and generate new forms of management, and the adoption of a new attitude favorable to innovation in companies became a managerial challenge for companies to achieve better results.

In the health sector, most innovation processes take place in hospital organizations, which, in turn, are characterized as a subsystem of the health sector of a medical-social nature and whose function is to provide care services, being known as to be organizations where several internal processes occur that are complex, interdependent (Souza et al., 2009) and present managerial challenges.

The importance of management for the innovation process was highlighted by several authors. Djellal and Gallouj (2007) performed a literature review on innovation in hospitals. Vargas et al. (2014) applied the integrative perspective from the investigation of hospital services. Engle et al. (2016) highlighted the importance of the manager's roles in implementing innovative practices. And Helm and Graf (2018) highlighted the importance of managers managing existing relationships and having the necessary competencies to manage organizational resources.

The existing literature on innovation management points to the existence of theoretical gaps, such as those pointed out by Silva (2011), who suggested proposing a methodology for the management of innovation in hospital environments, considering the peculiarities of these environments. Those evidenced by Nyle´n and Holmstro¨m (2015), by stating that most of the works found analyze the implementation or management of innovation processes related only to the manufacturing sector. Those evidenced by Vagnoni and Oppi (2015), who highlighted the need to carry out an assessment from the point of view of quality and results. And those pointed out by Charterina et al (2016) when pointing out the need to expand research on facilitators and their effects on the capacity for innovation. By considering these gaps, this article contributes to the literature by proposing a set of guidelines to support managers in the process of implementing innovation in hospital organizations.

Intending to contribute to filling the gaps highlighted by Silva (2011) and Nyle´n and Holmstro¨m (2015), this article was designed to seek an answer to the following research problem: What guidelines can be proposed to support management during the process of implementing innovations in hospital organizations? To answer this question, the article was prepared with the aim of proposing a set of guidelines to support management during the implementation of innovations in hospital organizations.

As a research method, a qualitative approach was adopted (Ketokivi & Choi, 2014), of an exploratory nature, through a case study, and allowed the collection of primary data, through interviews guided by a semi-structured script. Content analysis techniques were also used (Walter & Bach, 2015) with the help of the Atlas.ti software – Version 8 (Nelson et al., 2018) and the Lucicart software was used to edit the generated figures.

In addition to this introduction, the article presents the following structure: section 2 presents the theoretical reference. Section 3 presents the research method used. Section 4 discusses the presentation and analysis of data based on the case study developed and, finally, section 5 presents

the final considerations, highlighting the theoretical/academic and managerial contributions of the article, in addition to its limitations and suggestions for future research.

2. THEORETICAL REFERENCE

2.1. The Theory of Innovation

Although there are records of the use of the term innovation even in the late 1880s, the records of greatest influence for the construction of a theory of innovation are attributed to Schumpeter, who in his early writings defined innovation as "an industrial mutation process, which it incessantly revolutionizes the economic structure from within, incessantly destroying the old, incessantly creating a new one" (Śledzik, 2013, p. 3). The OSLO manual highlights that the work developed by Schumpeter had a great influence on the theories of innovation (OECD, 1997). The theory of innovation, developed by him in the early 1920s, was considered as "a driving force for economic growth" (Kühl & Cunha, 2013, p. 4).

In his writings, Schumpeter proposed the existence of five types of innovation: "i) launch of a new product [...]; ii) application of new production methods [...]; iii) opening a new market [...]; iv) acquisition of new sources of raw material supply [...]; and v) new industry structure" (Śledzik, 2013 p.3). This approach set precedents for new classifications. The OSLO Manual, for example, defines four types of innovations: a) product innovation; b) Process innovations; c) organizational innovations; e, d) marketing innovations (OECD, 1997).

Since Schumpeter highlighted the importance of innovation for companies to stand out in the market and gain competitive advantage over their competitors, several authors (Wu, 2014; Xu et al., 2015; Nyle´n & Holmstro¨m, 2015; Tuti et al., 2016; Cândido & Sousa, 2017) have been dedicated to studying the theme of innovation. However, most of the approaches observed in the literature were dedicated to studying the theme from the perspective of the manufacturing sector (Albertin et al., 2017), leaving out of this approach the service sector (Nilashi et al., 2016).

The process of technological development and innovation had a special acceleration from the first industrial revolution (Steele & Clarke, 2013) and from the 1980s onwards, the observed technological changes allowed the development of new processes and generated new managerial challenges for the management of internal and external resources needed to generate competitive advantage in the organizational environment (Wu, 2014) and this led to the search for an approach to innovation more suited to the service sector. In this sense, authors such as Djellal and Gallouj (2007) and Vargas et al. (2014) presented contributions on the study of innovation in hospital environments.

2.2. Approaches to service innovation

In recent years, efforts have been made to build a theory of innovation that is sufficiently comprehensive to encompass goods and services without, however, setting aside their differences (Vargas, 2006). The main discussions aimed to debate the compatibility between the neo-Schumpeterian theory of innovation and the efforts to establish a new integrative approach to innovation in services. Among the main advances observed, three initial lines are worth mentioning: the first, which is based on the technological origin of the innovations – Technician Approach; a second, which presents the singularities of the innovation process relevant to service activities - Service-Based Approach; and the third, which seeks to integrate these two strands and, with this, develop a theory of innovation in services - Integrating Approach (Vargas et al., 2014).

The technicist approach was advocated by Richard Barras in the 1980s. He sought to draw attention to the importance of the service sector in the innovation process. This model became known as the **product's reverse** cycle and aimed to promote an analysis of the changes caused in services because of the computerization process. This approach argues that new services or improved services are a result of the introduction of new technologies. Although the model he developed was considered useful, Barras was unable to consolidate his theory, but he was recognized as the first to seek the construction of a theory of innovation in services (Vargas, 2006).

The service-based approach emerged in contrast to the technicist approach and aimed to identify the particularities of the service production process and, therefore, show that even if the service provision activity is intangible, it is possible to promote innovations in the performance of services based on of its relational character and the irreversibility of its production process (Vargas, 2006). In this perspective, the OSLO manual highlights that innovations in the service sector "may include important improvements with regard to how they are offered (for example, in terms of efficiency or speed), the addition of new functions or features in existing services, or the introduction of entirely new services" (OECD, 1997, p. 58). This approach distanced itself from the original conception of Schumperter in 1911 and considers customer relations as a source of learning, which led to the emergence of a new type of innovation called contingent innovation or *ad-hoc* adhocratic, characterized by "(social) interactive construction of a solution strategic, organizational, social, legal, etc.) to a specific problem posed by the customer" and which involves the user as a co-producer of the innovation (Vargas et al., 2014, p. 6).

The integrative approach, in turn, was presented as a proposal to promote the integration of innovation in goods and services in a single theory. Even considering that there are differences between these activities, this approach argues that the emphasis should be on the particularities of the manufacturing or services activity, depending on the intensity of the relationship with the customer (Vargas, 2006). The approach also defends that there tends to be a convergence between manufacturing and services.

2.3. Development of innovations in hospital organizations

The innovation scenario has intensified in recent decades, especially with the advent of the fourth industrial revolution, referred to in the literature as industry 4.0 (Lu, 2017). This brought new management challenges, required the structuring of a management model focused on the development of new skills and continuous learning, and made companies wake up to the need to develop new management tools to sustain themselves in the conduct of innovation processes (Nyle´n & Holmstro¨m 2015).

When it comes to innovation in hospital services, one of the great challenges observed lies in combining a theoretical view of services with the complexity of hospital services, which are addressed in the literature, according to Djellal (2004) , in four recurrent approaches: the first one that treats the hospital as the place where the production of services takes place (production function); a second that perceives the hospital as a set of capabilities (technical and biopharmacological); the third which sees the hospital as an information system (managerial and medical) and the fourth, which presents the hospital as a provider of complex services.

The management of innovation in hospital organizations is related to the need to develop skills and competences to create and manage an organizational environment that, in addition to being concerned with health care, also facilitates the dissemination of an innovative philosophy in conducting processes and procedures. For this reason, the involvement of management became the subject of studies (Tuti et al., 2016; Abuhejleh et al., 2016), to analyze and implement improvements in the models for driving innovation in hospital organizations, aiming to reduce the impacts of changes caused by the innovation process and help companies in the process of learning to innovate.

2.4. The innovation management process in the hospital organization

The study of skills and abilities necessary for the development of an efficient management method leads to the need to carry out an analysis of the organizational environment, to reflect on the need to coordinate and integrate different flows for collective learning (Prahalad & Hamel, 1990).

Another important factor for the process of managing the implementation of innovations in hospital organizations is the evaluation of the results of the implemented innovations. Therefore, ideally, the management team should prepare or identify the main key performance indicators – KPI (Ioan et al., 2012; Si et al., 2017) needed to assess the individual involvement of each team member and develop a methodology to establish and monitor the objectives and key results – OKRs (Luna et al., 2017) aligned with the organizational objectives.

The OKRs methodology was advocated in the early 1990s by Andy Grover, CEO of Intel, with the function of defining goals and performance metrics for the organization (Luna et al., 2017). The method proposed by Grove for business management indicates the necessary conditions for conducting the process of evaluating the OKRs and can be carried out using two steps: a cycle of strategic reflection and a cycle of constant monitoring, as shown in Figure 1 below:

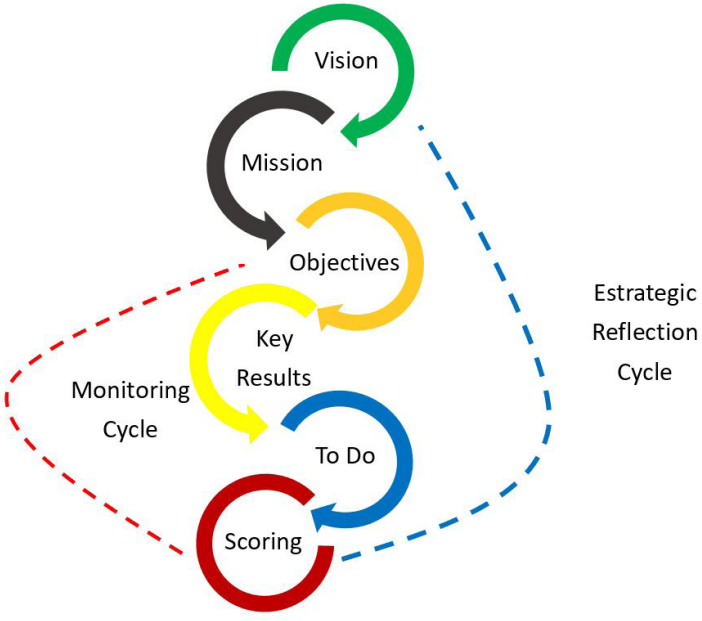


Figure 1. OKR Cycles
Source: Luna et al. (2017, p. 5)

According to the authors, the function of the monitoring cycles is to assess whether and how the objectives are being achieved, which is why they occur interactively between sectors. Strategic reflection cycles, in turn, have the function of helping the organization to fulfill its institutional purpose (mission and vision) and occur whenever the organization identifies the need to readjust its strategy to a new market reality.

Proposing guidelines to support management in the process of implementing innovations can contribute to the generation of knowledge and the accumulation of experiences, acting as a driver for collective learning, in addition to developing a continuous learning system so that the hospital will be able to learn from the experience of employees and from all the links involved in its value chain and, therefore, contribute to the generation of competitive advantage.

3. RESEARCH METHOD

This article was prepared using a qualitative approach (Ketokivi & Choi, 2014), exploratory in nature, through a case study, carried out in the first half of 2020 in two private, small, low, and medium complexity, for-profit, non-research hospitals located in the northeast region of Brazil. The case study strategy was chosen because it is a type of empirical research used to seek to understand a phenomenon in its real context (Dresch et al., 2015) and that it is suitable for studying a phenomenon in depth.

As a collection method, in addition to secondary data, the research used primary data, raised in the case study, which was conducted through interviews, using a semi-structured script, with subjective questions, elaborated based on the researched literature and aimed at two different audiences: the tactical level managers and the operational level employees of the hospitals surveyed, where, in total, 39 employees were surveyed. To develop an appropriate approach to achieving the objectives, the analysis method was based on the content analysis technique (Walter & Bach, 2015) with categories defined using the Atlas.ti software - Version 8 (Nelson et al., 2018) for systematizing the observations made in the surveyed companies and the Lucicart software was used to edit the generated figures. The collected data were divided and organized into blocks (axes), where each block represents an analyzed criterion. Thus, data analysis was organized by categorizing the information collected during the interview, according to the assigned categories.

The purpose of the analyzes carried out was not to carry out a comparative analysis between the two companies, but rather to identify converging, divergent, similar, or complementary aspects between the investigated hospitals, to highlight the considerations presented. All observations made were consolidated and analyzed to base the proposal of a set of guidelines to support hospital management when implementing innovations.

3.1. Companies surveyed

The research necessary for the elaboration of this article had as unit of analysis two hospitals located in the Northeast region of Brazil. The first hospital (Hosp-1) has 42 beds and has 147 employees. In this hospital, a total of 20 employees were interviewed, corresponding to a percentage of 13.61% of the staff, distributed among 9 operational team employees and 11 tactical level managers. The repeatability exhaustion criterion was used to determine the number of employees interviewed.

The second hospital (Hosp-2) has 44 beds and 248 employees. In this hospital, a total of 19 employees were interviewed, corresponding to a percentage of 7.70% of the staff, distributed among 13 employees of the operational team and 06 managers of tactical level. The accessibility

criterion determined the number of collaborators surveyed, since, during the research, the hospital restricted access to the team because of the COVID-19 pandemic in Brazil.

In each hospital, the survey respondents were selected based on two criteria: occupying a managerial position (tactical level manager, head of sector or section) or being an operational member of one of these managers' teams. Respondents were contacted "on-the-spot" during their work shift. Data were collected in the first half of 2020 through the application of a semi-structured questionnaire, with questions based on the researched literature and focused on seeking the respondents' perception of how the process of implementing innovations is conducted in the surveyed hospitals.

4. PRESENTATION AND DATA ANALYSIS

After processing the data collected with the case study, the information generated was grouped into four categories of analysis, to reflect the essence of the responses of the two surveyed audiences (employees and managers of the hospitals) and allow an efficient discussion in the light of existing literature and, with this, support the proposals that will be presented.

The first structured category presents information on how hospitals arouse to identify the need to innovate. The second category points out how the internal learning process is and reflects what needs to be done so that hospitals can learn to innovate. The third category specifically addresses how the innovation management process is in the researched hospitals, highlighting successes and weaknesses. The fourth and last category discusses the barriers and facilitators of the innovation process. The analysis of the categories referring to the two audiences surveyed in each of the hospitals is presented below, addressing first the employees (Figure 2), then the managers (Figure 3):

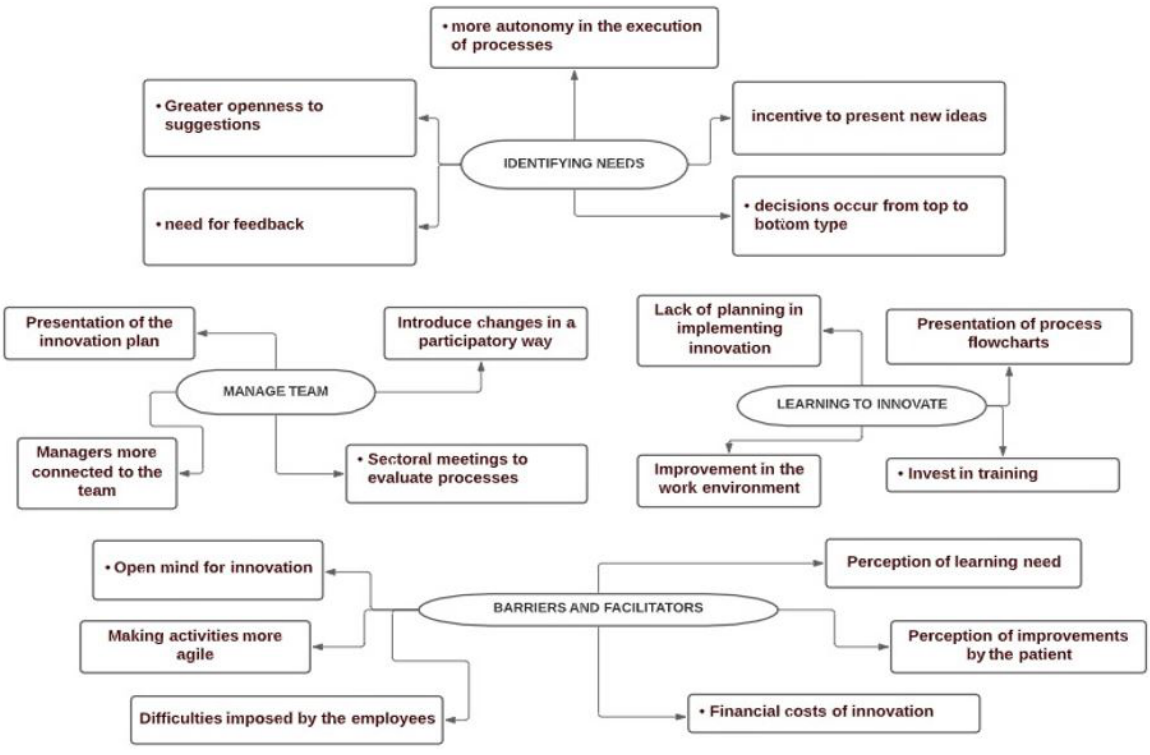


Figure 2. Research analysis categories, Hospital 1 employees
Source: Prepared by the authors.

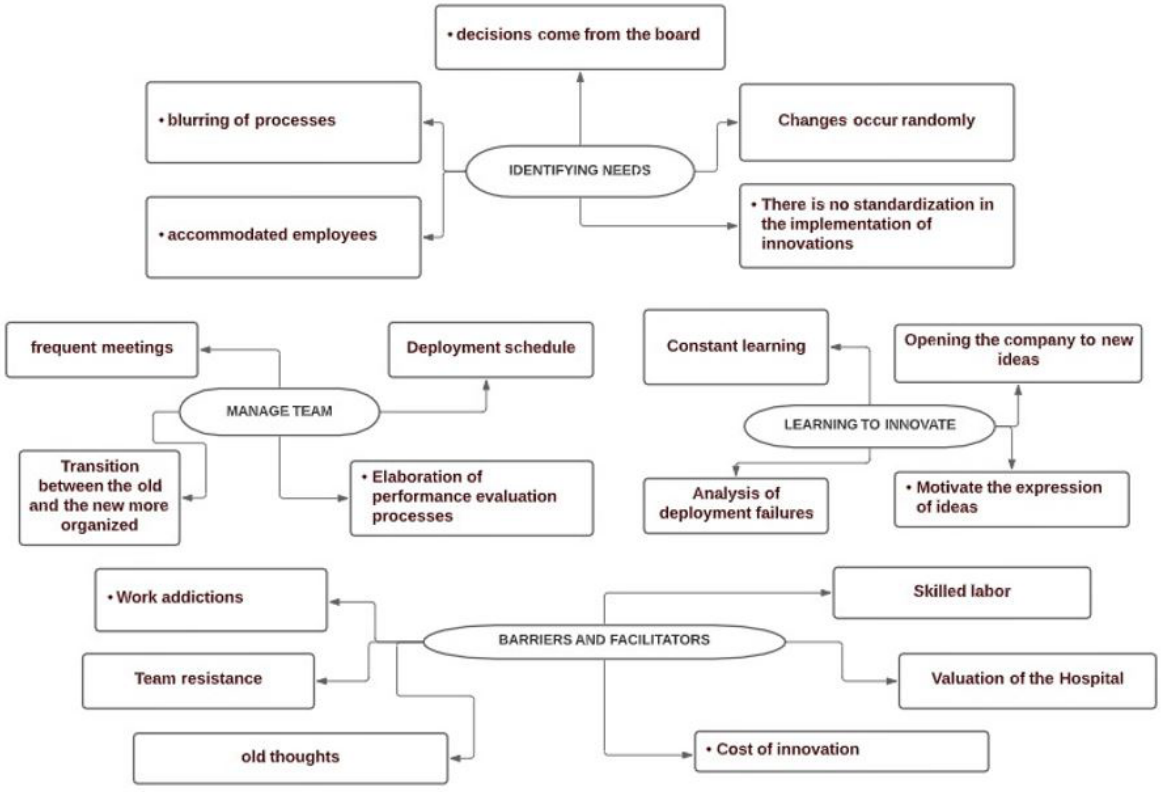


Figure 3. Research analysis categories, Hospital 2 employees
Source: Prepared by the authors.

In the first category of analysis, the responses presented by the employees of the two hospitals reflect that they do not use a single methodology, program, or structured procedure to identify opportunities for innovation or to generate new ideas. Although collaborators point out that it is possible to present ideas for innovation, when this occurs, they present their ideas to the tactical level managers, and they make the presentation to the hospital board.

Employees also stated that most innovation opportunities arise from problem identification, that is, in a reactive way. Although the problems are considered as generating sources of innovations, Djellal and Gallouj (2007) highlight that, due to the organizational complexity of a hospital, it has many other sources of innovation that can be explored.

In the second category of structured analysis, it was possible to observe that the responses presented by employees of the two hospitals highlight that there is no suitable work environment for the practice of innovation and that employees understand that they are not heard or do not participate in the innovation process. Employees highlighted the need to create a harmonious and adequate climate for the practice of innovation to encourage the team's participation in the process.

When analyzing the literature, Khademi (2019) emphasizes that it is essential for any company to have an adequate ecosystem for the practice of innovation. And Heidemann et al. (2016) highlights that an open innovation environment provides three benefits: sharing knowledge; cost reduction; and the speed of development.

The analyzes carried out in the third category allowed us to observe that the employees of the two hospitals understand that, in the team management process, one of the biggest deficiencies

is the communication process adopted by the hospitals. In the employees' view, communication is flawed, and they are often not communicated about the changes with the necessary time to prepare for them. The employees also stated that the process of evaluating the results obtained with the implementation of innovations is not carried out in a standardized way. In the literature, Inomata (2017) states that when there is an effective management, it is possible to significantly increase the company's income and level of innovation.

The analyzes carried out in the fourth category of the survey allowed us to identify what employees consider as barriers and facilitators of the innovation process. In this aspect, employees highlight as a barrier the fact that people are resistant to change and that older employees are more resistant to the innovation process. When analyzing the facilitators, they highlighted the fact that there is a perception that innovations streamline services and improve the hospital's results, making it more competitive. The employees also highlighted that there is a perception that the team grows together with the hospital.

Once the analysis of the responses of the employees of the two hospitals had been completed, we set out to analyze the responses presented by the tactical level managers. These managers are supervisors, team leaders or sector coordinators. The analysis of the answers presented by the hospital managers is presented below (Figures 4 and 5):

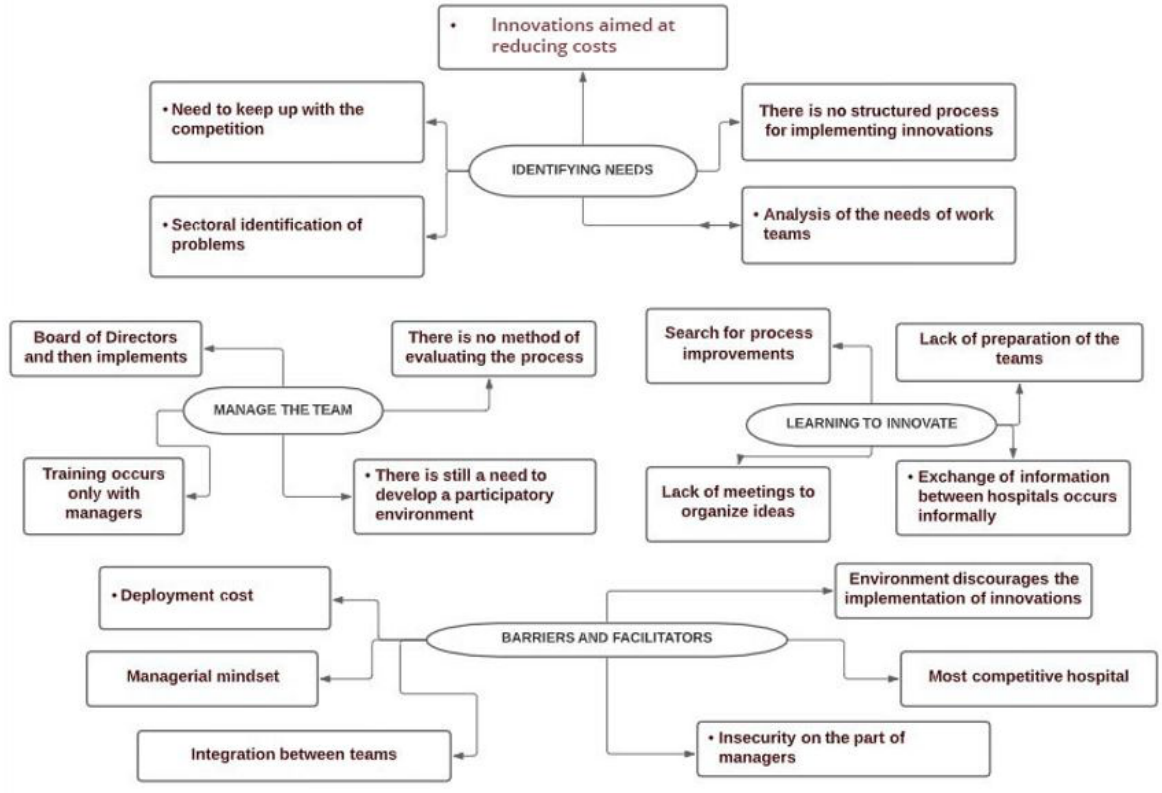


Figure 4. Research analysis categories, Hospital 1 managers
Source: Prepared by the authors.

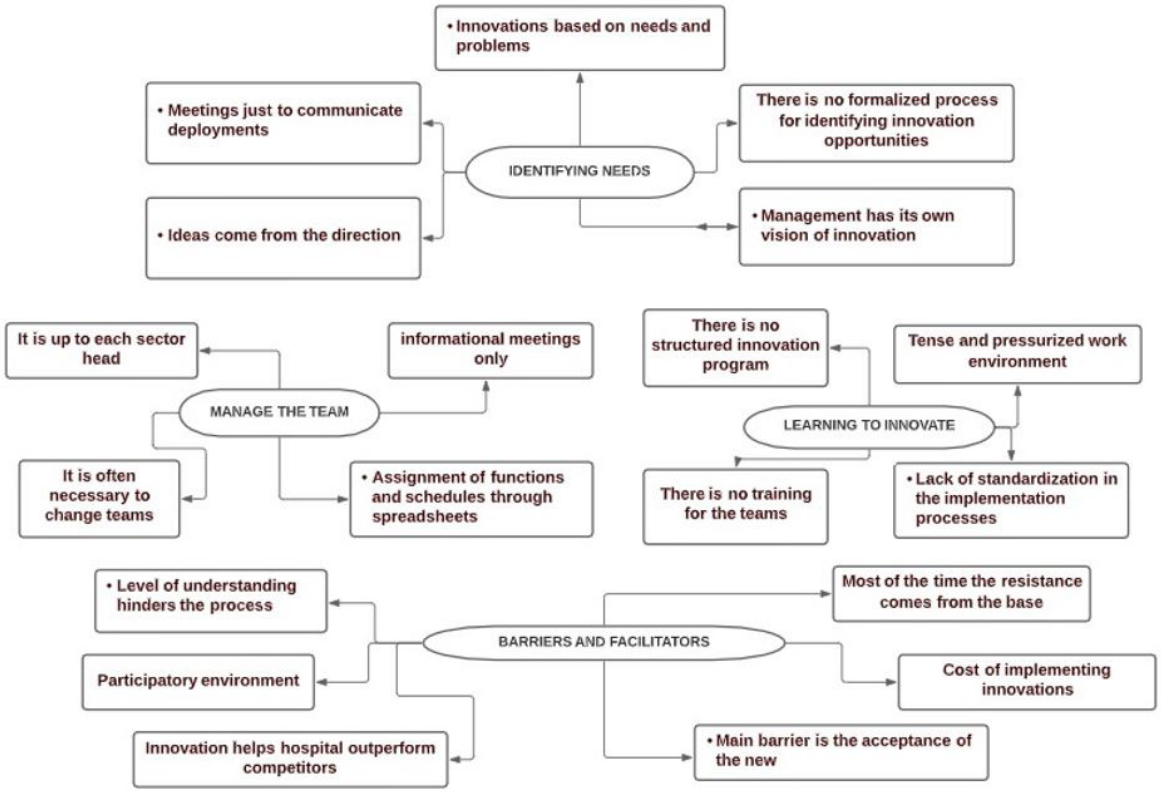


Figure 5. Research analysis categories, Hospital 2 managers
Source: Prepared by the authors.

When analyzing the responses presented by managers in the first category of analysis, it was possible to observe that they claim that there is no structured process for identifying opportunities for improvement in hospitals, which confirms the position previously presented by employees. Another point that corroborates the notes presented by employees is that managers also report that the process of identifying opportunities for improvement often takes place through the identification of problems or constraints, which confirms the hospitals' reactive model of action.

The managers of the two hospitals stated that there is no type of structured procedure to promote the exchange of experience with other institutions and, when this happens, it occurs due to the personal relationship between the hospital employee and the other institution, however, there is nothing formalized. As for internal learning, they confirmed that employees do not feel that they participate in the innovation process and understand that, when the process happens, it takes place in an imposing manner.

In the literature, Soda et al. (2017) draw attention to the fact that managerial decisions can affect the involvement of employees and the climate of collaboration at work. Teece et al. (1997) emphasize the importance of **recognizing the need for innovation and building internal competences** to **address rapidly changing environments** and Souza et al. (2014) highlight that it is necessary to perceive opportunities and **learn from perceived opportunities**.

In the second category of analysis, the analyzes carried out contributed to verifying that: **it is possible to identify factors that contribute to the successful implementation of innovations**

in hospital environments. These factors are involving the team and middle management (tactical level) in the innovation process; involve partners and stakeholders; valuing human capital; and create an ecosystem suitable for the practice of innovation so that the hospital can **learn to innovate**.

Learning to innovate, therefore, goes through the phase of involving collaborators and partners (Kähkönen et al., 2017) in the innovation process, because, according to Prokop et al. (2019), human capital has a singular importance in this process and people are fundamental for the company to generate and use knowledge (Abreu & Urze, 2016) and, with this, create an innovation ecosystem (Soda et al., 2017) that facilitates organizational learning.

When analyzing the perception of managers about the third category of analysis, corresponding to the process of **managing the team**, it was observed that some of the allegations presented by employees are also corroborated by managers, confirming that there are flaws in the team management process for the innovation process.

A synthesis of the perceptions of the managers of the two hospitals points to the need to improve the work environment and develop a standardized, efficient communication process that takes the opinion of the managers into account. They also pointed out that it is necessary to structure methods for the implementation and evaluation of innovations, as each manager intuitively conducts the process. In this sense, the literature highlights the need to adopt performance indicators (Ioan et al., 2012; Si et al., 2017) to assess the team's performance and result indicators (Luna et al., 2017) to assess the achievement of organizational goals to then assess whether the company managed to achieve its main results.

In the analysis of the fourth category, it was possible to observe that managers have a perception that is like the perceptions of employees, which demonstrates an alignment of views on the organizational environment. Managers pointed out people's resistance to change as the main barrier, highlighting that there is a lack of integration between the teams. They also highlighted that the hospital environment discourages the practice of innovation and that the hospitals surveyed do not have a program to generate new ideas. They also pointed out the existence of financial and bureaucratic barriers. As for the facilitators, they highlighted the existence of people with an innovative profile in the team and the creation of an environment where everyone can participate, presenting ideas and criticism.

When comparing the information collected in hospitals with the approaches in the literature, it can be highlighted that it is essential to involve managers in the innovation process (Tuti et al., 2016; Abuhejleh et al., 2016), since they are responsible for coordinating and integrate the team into collective learning flows (Prahalad & Hamel, 1990) to interact and reconfigure internal competences (Teece et al., 1997) aiming to improving organizational competitiveness (Souza et al., 2014).

It was also possible to highlight an alignment regarding the identification of the main barriers and facilitators, with those pointed out by Manca et al. (2018), which highlight the resistance to change, lack of integration between management and the base, low degree of employee involvement, lack of infrastructure and inadequate organizational culture to practice innovation.

The main findings of the case study, which served as the basis for the proposal of the guidelines are presented in the table below (Table 1), where the last column, referring to the steps, presents numbers that are repeated, depending on the groupings that will be carried out after, in the structuring of the proposed guidelines:

Table 1
Main findings of the case study.

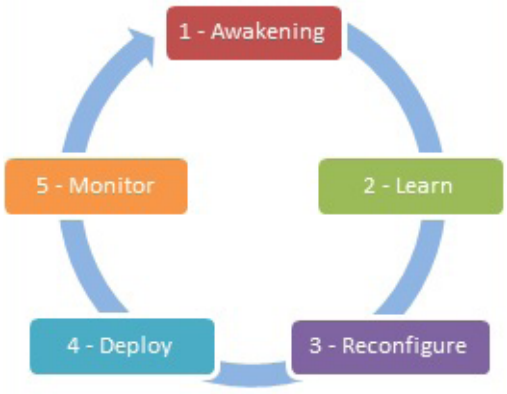
Finding	Recommendation	Theoretical foundation	Step in the proposed method
"The innovation process is often reactive and innovation opportunities arise from the identification of problems or constraints"	"Hospitals need to arouse to realize opportunities for innovation"	Teece et al. (1997); Souza et al. (2014).	1 Arouse
"Hospitals do not have a structured method to identify opportunities or needs for innovation and employees do not feel they participate in the innovation process."	"It is necessary to create an adequate environment to involve internal actors in the process of development and implementation of innovation"	Souza et al. (2014); Engle et al. (2016); Tuti et al. (2016); Abuhejleh et al. (2016)	3 Reconfigure
"Managers are not adequately prepared to lead the innovation process and employees are not encouraged to innovate"	"Hospitals must develop an institutional philosophy capable of encouraging staff to learn to innovate"	Tidd, Bessant & Pavitt (2008); Birken et al. (2012); Souza et al. (2014); Engle et al. (2016).	2 Learn
"The environment is not suitable for the practice of innovation".	"Hospitals must create an internal environment that encourages the practice of innovation"	Souza et al. (2014); Soda et al. (2017).	3 Reconfigure
"There are no metrics or structured mechanisms at the institutional level to assess the result of implemented innovations"	"A constant monitoring methodology must be defined to evaluate the indicators and monitor the results of the implemented innovations".	Ioan et al. (2012); Si et al. (2017); Luna et al. (2017).	5 Monitor
"There are flaws in the process of managing and preparing the team for the innovation process".	"It is necessary to involve mid-level managers in the process of implementing innovations"	Helm and Graf (2018); Manca et al. (2018); Shamsuzzoha et al. (2017).	4 Implementation
"Due to its complexity, the hospital environment often discourages the practice of innovation"	"The hospital needs to create an ecosystem of innovation where the entire team can participate by presenting ideas, criticisms and suggestions"	Souza et al. (2014); Engle et al. (2016); Soda et al. (2017).	3 Reconfigure
"Employees are resistant to change"	"The hospital must implement innovations using the management-by-goal approach and exploring external partners"	Manca et al. (2018); ISLAM, (2015); FOSSAS-OLALLA *et al*, (2015); Rajkumar and Stentoft (2017).	4 Implementation

Source: Prepared by the authors.

Considering the above and as a result of the analysis carried out, it was possible to propose a set of guidelines that can contribute to supporting managers when conducting innovation implementation processes in hospital organizations. The guidelines developed were based on the deficiencies pointed out by the hospitals in the case study, as well as using as a foundation the weightings found in the researched literature and were structured in five steps, each of which

corresponds to a part of a macro process that, together, constitute the guidelines proposed by this article.

For each of the five steps, a set of guidelines was prepared to support management in the process of implementing innovations in hospital organizations and were structured in a sequential manner, where the result of the monitoring step generates the need to arouse to a new process



of innovation, which constitutes a virtuous cycle. The steps are shown in Figure 6 below and will be detailed below:

Figure 6. Proposed steps for implementing innovations in hospital organizations
Source: Prepared by the authors

Step I: AROUSE

The hospital must be able to recognize the need to innovate and detect existing opportunities and threats (Souza et al., 2014; Luna et al., 2017) in the internal or external environment. Then, it must eliminate the restrictions that prevent or impede the innovation process and it must focus on developing the necessary internal skills (Dynamic Capabilities) for the innovation process (Teece et al., 1997) to obtain competitive advantage. As proposed for this step, the hospital must observe the following guidelines: **perform an initial diagnosis on the need to implement improvements; recognize the need to innovate; and identify opportunities for innovation.**

Step II: LEARN TO INNOVATE

The hospital needs to understand that innovation management is a learned skill and, therefore, it must focus efforts to seek to learn from the perceived opportunities (Teece et al., 1997; Souza et al., 2014) to involve employees and managers tactical level in the innovation process (Birken et al., 2012).

At this stage, the objectives and key results (OKRs) must be defined, and an organizational climate must be created that allows for collaborative involvement – bottom-up and not just imposing – top-down (Luna et al., 2017). After that, it is necessary to define the roles of employees and managers in the innovation implementation process (Birken et al., 2012) and, when necessary, involve partners and key people in the innovation process (Johnston & Huggins, 2016; Shamsuzzoha et al., 2017; Prokop et al., 2019) to then coordinate and integrate the flows to generate collective learning (Prahalad & Hamel, 1990). The proposal for carrying out this step is that the hospital must observe the following guidelines: **define objectives and key results**

to be achieved – OKRs; identify the resources needed; develop policies, implementation practices and the roles of those involved; and involve key people and partners.

Step III: RECONFIGURE THE ENVIRONMENT

At this stage, the hospital must understand that, often, the complexity and dynamics of the hospital environment (Souza et al., 2009) end up not encouraging the team to participate in the innovation process. Therefore, it is necessary to carry out a self-analysis of its functional structure and assess the quality of the infrastructure and available resources to then promote the necessary adjustments.

Hospitals often need to reconfigure the environment and internal competencies (Teece et al., 1997; Souza et al., 2014) to encourage team engagement. The environment must be conducive and have clear rules to avoid conflicts of interest (Helm & Graf, 2018) in the innovation process. The environment must also be flexible (Manca et al., 2018) and capable of promoting disruptive thoughts and actions to generate innovations. The proposed guidelines for step III are presented below: **carry out organizational climate survey to identify the level of engagement of the team with the innovation process; identify barriers and facilitators in the process of implementing innovations; reconfigure the environment and create an ecosystem suited to the innovation process; elect the person or sector responsible for the innovation process; define the evaluation rules and criteria (OKRs and KPIs); and, involve and engage the necessary links in the innovation implementation process.**

Step IV: IMPLEMENTING INNOVATIONS

In the implementation stage, some precautions need to be taken to ensure success and gain in competitiveness. In this sense, the hospital needs to involve and encourage employees to participate in the innovation process and, if it does not have all the necessary resources internally, it is recommended to form partnerships for the development and implementation, in a collaborative way (Rajkumar & Stentoft, 2017), which helps to reduce risks and uncertainties in the process and facilitates achieving the objectives (Garmann-Johnsen & Eikebrokk, 2014).

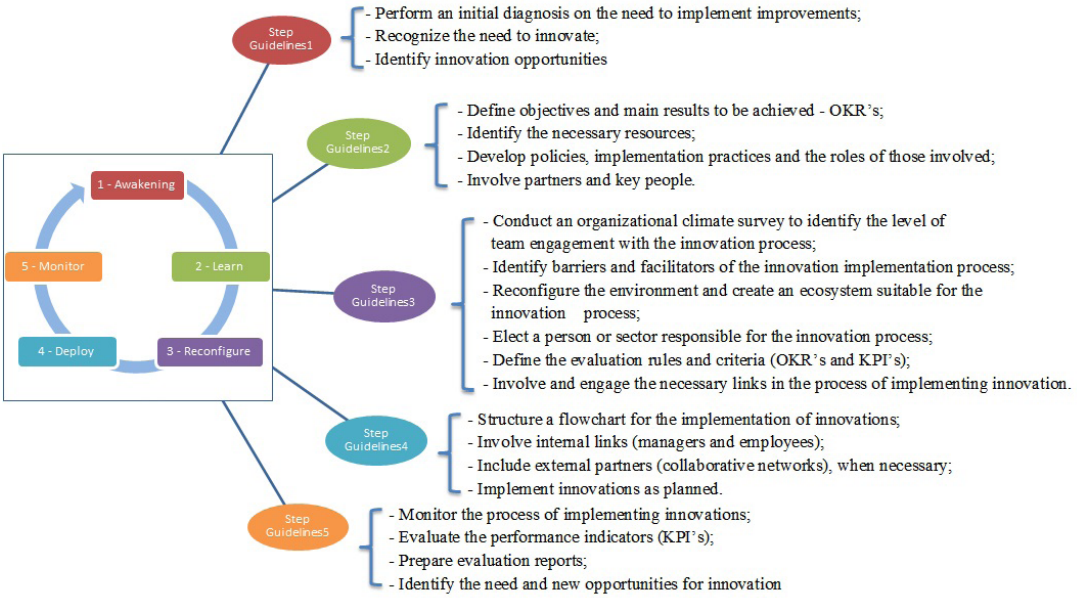
In addition to internal collaborators, there are potential external partners (Johnston & Huggins, 2016) that can be organized in the form of collaborative networks and contribute to the innovation process (Bueno & Balestrin, 2012). Collaboration networks are an efficient strategy for the process of developing and implementing innovations (Mircea et al., 2016) and for obtaining competitive advantage (Rajkumar & Stentoft, 2017; Fossas-Olalla et al., 2015). The proposal presented is so that the process of implementing innovations can be conducted through the following guidelines: **structuring a flowchart for the implementation of innovations; involve internal links (managers and employees); include external partners (collaborative networks) when necessary; and implement innovations according to planning.**

Step V: MONITOR THE RESULTS

It is in the monitoring stage that the planned results will be assessed. This step must be conducted interactively between the various sectors, to constantly assess the alignment of results with organizational purposes (mission, vision, and values) and, therefore, define the need to initiate innovation processes. This step must be conducted through cycles of constant monitoring (Luna et al., 2017), which results will support the identification of new opportunities or innovation needs.

For this reason, the monitoring parameters need to be well defined so that everyone understands how they will be evaluated. In this sense, the hospital must define which will be the key performance

indicators - KPIs (Ioan et al., 2012; Si et al., 2017), individual and collective, that will be used to monitor the achievement of the objectives and key results - OKR (Luna et al., 2017) and the frequency with which the measurements will be performed. The proposed guidelines for the monitoring step are presented below: **monitor the innovation implementation process; evaluate key performance indicators (KPIs); prepare evaluation reports; and identify the need and new opportunities for innovation**. Thus, a summary of the steps and proposed guidelines is



presented in Figure 7, below:

Figure 7. Steps and proposed guidelines
Source: Prepared by the authors

The preparation of the monitoring stage completes the stages and serves as a basis for identifying new opportunities for innovation, which constitutes a virtuous cycle, capable of assisting management in the process of implementing innovations and, therefore, confirms that it is possible to develop guidelines to assist management in conducting the process of implementing innovations in hospital organizations.

5. FINAL CONSIDERATIONS

The need for innovation in companies arouses interest in researching the literature for its application in the most varied sectors. However, the literature does not present a specific methodology to support the process of implementing innovations in companies. The preparation of this article fulfilled its objective by answering the research question and proposing a set of guidelines to support management during the implementation of innovations in hospital organizations.

As a result, it was possible to structure a sequence of actions, grouped into five stages, capable of supporting management in the process of implementing innovations, from the moment the company arouses to the need to innovate to the effective monitoring of the achievement of the

intended objectives with the innovation process, which allowed us to propose a set of guidelines to support management professionals in conducting each of these stages.

The proposed guidelines show the importance of the company **arousing** to the need to innovate (Teece et al., 1997; Souza et al., 2014; Luna et al., 2017) and seeking to **learn** from the perceived opportunities (Teece et al., 1997; Souza et al., 2014; Luna et al., 2017) to **reconfigure** the environment (Souza et al., 2014; Helm & Graf, 2018; Manca et al., 2018) in order to create an innovation ecosystem that facilitates to **implement** innovations (Garmann-Johnsen & Eikebrokk, 2014; Johnston & Huggins, 2016; Rajkumar & Stentoft, 2017), which is able to encourage team participation and allows the company to **monitor** projected results (Ioan et al., 2012; Si et al., 2017; Luna et al., 2017).

The article contributed to the literature by presenting empirical contributions in the field of study to fill gaps, such as those presented by Silva (2011), who suggested **proposing a methodology for the management of innovation in hospital environments, considering the peculiarities of these environments**, and those evidenced by Nyle'n and Holmstro¨m (2015), who stated that **most of the works found analyze the implementation or management of innovation processes related only to the manufacturing sector and, therefore, do not present approaches related to services sector** and that, in this case, there is a theoretical gap to be filled. The article also allowed us to corroborate the position of authors such as Engle et al. (2016), on the importance of the manager's roles in the implementation of innovative practices, by Aires et al. (2017), on people's learning in organizations; and added academic and managerial contributions.

The theoretical/academic contributions lie in exploring the theory of innovation and in presenting empirical contributions to fill gaps, highlighting the importance of realizing the need to innovate and reconfigure the environment to take advantage of innovation opportunities (Souza et al., 2014), establish indicators to monitor the innovation process (Ioan et al., 2012; Si et al., 2017; Luna et al., 2017); and, by proposing guidelines for the implementation of innovation in hospital organizations.

The management contributions highlight the importance of managing the innovation implementation process and present a set of guidelines capable of supporting management at the time of implementing innovations in hospital organizations for each of the five stages that comprise the proposed guidelines.

Although the article was developed with scientific rigor, the fact that the research was carried out in only two hospitals in the northeast region of Brazil stands out as a limiting factor, which may configure characteristics of regionalism and, therefore, as a suggestion for future work, it is recommended to replicate the research in hospitals in other regions in order to corroborate or refute the validity of the proposed guidelines or even suggest complementing the guidelines presented. It is also recommended that the guidelines can be applied in other hospitals to support the development of an empirical method for the implementation of innovations in hospital organizations. In this sense, the practical application of the proposed guidelines can support the development of an empirical method for the implementation of innovations in the service

sector. New research can be undertaken to propose methods or models for the implementation of service business innovations.

REFERENCES

Abreu, A., & Urze, P. (2016). System thinking shaping innovation ecosystems. *Open Engineering*, *6*(1), 418-425. https://doi.org/10.1515/eng-2016-0065

Abuhejleh, A., Dulaimi, M., & Ellahham, S. (2016). Using lean management to leverage innovation in healthcare projects: Case study of a public hospital in the UAE. *BMJ Innovations, 2*(1), 22-32.

Aires, R. W. A., Moreira, F. K., & Freire. P. S. (2017). INDÚSTRIA 4.0: Competências requeridas aos profissionais da quarta revolução industrial. In *VII Congresso Internacional de Conhecimento e Inovação, 11 e 12 de setembro de 2017.* Foz do Iguaçu, PR, Brasil.

Albertin, M. R., Elienesio, M. L. B., Aires, A. S., Pontes, H. L. J., & Aragão, D. P., Jr. (2017). Major tech innovations in industry 4.0 and its applications and implications in manufacturing. In *XXIV Simpósio de engenharia de produção*. Bauru, SP, Brasil.

Birken, S. A., Lee, S.-Y. D., & Weiner, B. J. (2012). Uncovering middle managers' role in healthcare innovation implementation. *Implementation Science*, *7*(1), 28.

Bueno, B., & Balestrin, A. (2012). Inovação colaborativa: Uma abordagem aberta no desenvolvimento de novos produtos. *Revista de Administração de Empresas*, *52*(5), 517-530.

Cândido, A. C., & Sousa, C. (2017). Open innovation practices in strategic partnerships of cloud computing providers. *Journal of Technology Management & Innovation*, *12*(2), 59-67.

Charterina, J., Basterretxea, I., & Landeta, J. (2016). Types of embedded ties in buyersupplier relationships and their combined effects on innovation performance. *Journal of Business & Industrial Marketing*, *31*(2), 152-163.

Djellal, F. (2004). *L'hospital invovateur: de l'innovation médical à l'innovation de servisse*. Masson.

Djellal, F., & Gallouj, F. (2007). Innovation in hospitals: A survey of the literature. *The European Journal of Health Economics*, *8*(3), 181-193. https://doi.org/10.1007/s10198-006-0016-3

Dresch, A., Lacerda, D. P., & Antunes, J. A. V., Jr. (2015). *Design Science Research: Research Method for Advancement of Science and Technology*. Bookman.

Drucker, P. (1986). *Innovation and Entrepreneurship.* Harper Perennial.

Engle, R. L, Lopez, E. R., Gormley, K. E., Chan, J. A., Charns, M. P., & Van, D. L. (2016). What roles do middle managers play in implementation of innovative practices? *Health Care Management Review*, *42*(1), 14-27.

Fossas-Olalla, M., Minguela-Rata, B., López-Sánchez, J. I., & Fernández-Menéndez, J. (2015). Product innovation: When should suppliers begin to collaborate? *Journal of Business Research*, *68*(7), 1404-1406. http://doi.org/10.1016/j.jbusres.2015.01.022

Garmann-Johnsen, N. F., & Eikebrokk, T. R. (2014). Critical Success Factors for Inter-Organizational Process Collaboration in eHealth. In *eTELEMED 2014: The Sixth International Conference on eHealth, Telemedicine, and Social Medicine* (pp. 217-223). Barcelona, Spain.

Hamel, G. (2000). *Leading the Revolution.* Harvard Business School Press.

Heidemann, C., Du, Y., Paprott, R., Haftenberger, M., Rathmann, W., & Scheidt-Nave, C. (2016). Temporal changes in the prevalence of diagnosed diabetes, undiagnosed diabetes and prediabetes:

findings from the German Health Interview and Examination Surveys in 1997-1999 and 2008-2011. *Diabetic Medicine*, *33*(10), 1406-1414. https://doi.org/10.1111/dme.13008

Helm, R., & Graf, Y. A. (2018). A capabilities-based service development process for industrial manufacturers. *International Journal of Knowledge Management Studies, 9*(1), 85-102.

Inomata, D. O. (2017). *Redes colaborativas em ambientes de inovação: Uma análise dos fluxos de informação*. [Tese submetida ao Programa de Pós-Graduação em Ciência da Informação]. Universidade Federal de Santa Catarina.

Ioan, B., Nestian, A. S., & Tiţă, S-M. (2012). Relevance of Key Performance Indicators (KPIs) in a Hospital Performance Management Model. *Journal of Eastern Europe Research in Business & Economics*, *2012*, 674169. https://doi.org/10.5171/2012.674169

Johnston, A., & Huggins, R. (2016). The Spatio-Relational Nature of Urban Innovation Systems: Universities, Knowledge Intensive Business Service Firms, and Collaborative Networks. *Journal of Urban Technology*, *23*(1). https://doi.org/10.1080/10630732.2015.1090192

Kähkönen, A., Lintukangas, K., Ritala, P., & Hallikas, J. (2017). Supplier collaboration practices: Implications for focal firm innovation performance. *European Business Review*, *29*(4), 402-418. https://doi.org/10.1108/EBR-04-2016-0058

Ketokivi, M., & Choi, T. (2014). Renaissance of case research as a scientific method. *Journal of Operations Management*, *32*(5), 232-240. https://doi.org/10.1016/j.jom.2014.03.004

Khademi, B. (2019). The ecosystem knowledge explorer: A tool to systematically discover external knowledge. *Technology Innovation Management Review*, *9*(7), 28-40. http://doi.org/10.22215/timreview/1253

Kühl, M. R., & Cunha, J. C. (2013). Obstáculos à implementação de inovações no Brasil: como diferentes empresas percebem sua importância. *BBR Brazilian Business Review*, *10*(2), 1-25.

Lu, Y. (2017) Industry 4.0: A survey on technologies, applications and open research issues. *Journal of Industrial Information Integration,* 6 1–10.

Luna, A. J. H. O., Ribeiro, F. J., Maciel, T. M. M., Farias, I. H., Jr., & Moura, H. P. M. (2017). Uma abordagem para o gerenciamento estratégico ágil em saúde utilizando PES, OKR e MAnGve. *Revista Eletrônica Estacio Recife*. *3*(2).

Manca, C., Grijalvo, M., Palacios, M., & Kaulio, M. (2018). Collaborative workplaces for innovation in service companies: Barriers and enablers for supporting new ways of working. *Service Business*, *12*, 525-550. https://doi.org/10.1007/s11628-017-0359-0

Mircea, M., Ghilic-Micu, B., Stoica, M., Sinioros, P. (2016). Inter-organizational performance and business process management in collaborative networks. *Economic Computation and Economic Cybernetics Studies and Research*, *50*(2), 107-122.

Nelson, M. B., Riley, K., & Arellano, K. (2018). Adding a parent to the brain tumor team: Evaluating a peer support intervention for parents of children with brain tumors. *Journal of Pediatric Oncology Nursing*, *35*(3), 218-228. https://doi.org/10.1177%2F1043454218762797

Nilashi, M., Ahmadi, H., Ahani, A., Ravangard, R., & Ibrahim, O. B. (2016). Determining the importance of Hospital Information System adoption factors using Fuzzy Analytic Network Process (ANP). *Technological Forecasting & Social Change*, *111*, 244-264.

Nyle´n, D., & Holmstro¨m, J. (2015). Digital innovation strategy: A framework for diagnosing and improving digital product and service innovation. *Business Horizons*, *58*(1), 57-67.

OECD. (1997). *Manual de Oslo - Diretrizes para coleta e interpretação de dados sobre inovação*. (3 ed.). FINEP.

Prahalad, C. K., & Hamel, C. (1990) The core capability of the corporation. *Harvard Business Review*, *68*(3), 79-91.

Prokop, V., Stejskal, J., & Hudec, O. (2019). Collaboration for innovation in small cee countries. *Business Administration and Management*, 22(1), 130-144.

Rajkumar, C., & Stentoft, J. (2017). Harnessing capabilities and practices for sourcing innovation: An exploratory study. *Logistics Research*, *10*(1), 1-21. https://doi.org/10.23773/2017_10

Shamsuzzoha, A., Al-Kindi, M., & Al-hinai, N. (2017). Open Innovation in Small and Medium Size Enterprises - Perspective from Virtual Collaboration. *International Journal of Engineering and Technology Innovation*, *8*(3), 173-190.

Si, S., You, X., Liu, H., & Huang, J. (2017). Identifying Key Performance Indicators for Holistic Hospital Management with a Modified DEMATEL Approach. *International Journal of Environmental Research and Public Health*, *14*(8), 934. https://doi.org/10.3390/ijerph14080934

Silva, D. O. (2011). *Proposta para análise da gestão da inovação em serviços hospitalares: Um estudo no hospital mãe de Deus*. [Dissertação de Mestrado]. Universidade do Vale do Rio dos Sinos - São Leopoldo.

Śledzik, K. (2013). Schumpeter's view on innovation and entrepreneurship. *SSRN Electronic Journal*. https://dx.doi.org/10.2139/ssrn.2257783

Soda, G., Stea, D., & Pedersen, T. (2017). Network structure, collaborative context, and individual creativity. *Journal of Management*, *45*(4).

Souza, A. A., Guerra, M., Lara, C. O., Gomide, P. L. R., Pereira, C. M., & Freitas, D. A. (2009). Controle de gestão em organizações hospitalares. *Revista de Gestão USP*, *16*(3), 15-29.

Souza, L. L. C. D., Holanda, R. R., Sousa, S. P., & Costa, E. V. (2014). Estratégias de inovação e crescimento sustentadas por práticas da gestão do conhecimento. *Navus - Revista de Gestão e Tecnologia*, *3*(2), 89-104.

Steele, R., & Clarke, A. (2013). The internet of things and next-generation public health information systems. *Communications and Network*, *5*(3), 4-9. doi:10.4236/cn.2013.53B1002

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal*, *18*(7), 509-533.

Tidd, J., Bessant, J., Pavitt, K. (2008) *Gestão da Inovação*. 3ª Ed. Porto Alegre: Bookman.

Tuti, T., Bitok, M., Paton, C., Makone, B., Malla, L., Muinga, N., Gathara, D., & English, M. (2016). Innovating to enhance clinical data management using non-commercial and open-source solutions across a multi-center network supporting inpatient pediatric care and research in Kenya. *Journal of the American Medical Informatics Association*, *23*(1), 184-192.

Vagnoni, E., & Oppi, C. (2015). Investigating factors of intellectual capital to enhance achievement of strategic goals in a university hospital setting. *Journal of Intellectual Capital*, *16*(2), 331-363. https://doi.org/10.1108/JIC-06-2014-0073

Vargas, E. R. (2006). *A dinâmica da inovação em hospitais: o caso dos serviços hospitalares no Brasil e na França*. [Tese de Doutorado]. Universidade Federal do Rio Grande do Sul.

Vargas, E. R., Figueiredo, K. F., Araujo, C. A. S., Bohrer, C. T., & Farias, J. S. (2014). Innovation in Hospitals and the Service-Dominant Logic. *Revista de Gestão em Sistemas de Saúde - RGSS*, *3*(1), 14-26.

Walter, S. A., & Bach, T. M. (2015). Adeus papel, marca-texto, tesoura e cola: inovando o processo de análise de conteúdo por meio do atlas.ti. *Administração Ensino e Pesquisa*, *16*(2), 275-308.

Wu, C.-W. (2014). The study of service innovation for digiservice on loyalty. *Journal of Business Research*, *67*(5), 819-824.

Xu, Y., Enrique Ribeiro-Soriano, D., & Gonzalez-Garcia, J. (2015). Crowdsourcing, inovação e desempenho da empresa. *Management Decision*, *53*(6), 1158-1169. https://doi.org/10.1108/MD-06-2014-0408

CONFLICTS OF INTEREST

The authors expressly declare that there are no conflicts of interest.

AUTHOR'S CONTRIBUTION

Author 1 led the process of conceptualization, database research, data analysis and formal analysis, conducting the research and choosing the methodology, in addition to participating in the writing process of the chapters.
Author 2 contributed to the conceptualization process, choice of methodology, writing of the text and led and supervised the administration of the research project.
Author 3 contributed to the process of data analysis and formal analysis by managing the software used, writing the text, and preparing concept maps.
Author 4 contributed to the process of formal analysis, definition of the methodology, research in databases, writing of the text and use of the tabulation software for the generation of concept maps.