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REFLECTIONS ON SUSTAINABILITY-ORIENTED INNOVATION IN HEALTH SERVICES

Reflexões sobre a inovação orientada para a sustentabilidade nos serviços de saúde

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ABSTRACT

The study's objective consists of a theoretical reflection on how sustainability-oriented innovation (SOI) can be developed in the context of health services. The work format is a theoretical essay based on research in journals that comprise the Scopus database, using the Business, Management and Accounting filters. Among the study's contributions, we can mention identifying factors related to adopting SOI in the health context, highlighting the main and necessary aspects for developing SOI in this segment. A conceptual SOI scheme can be proposed, demonstrating that the path to becoming a sustainable organization passes through the articulation of processes in a strategic way, which involves the need to adopt a sustainable business model that places the generation of value of the organization through SOI.
Keywords: Sustainable Innovation, Sustainability, Health services.

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REFLEXÕES SOBRE A INOVAÇÃO ORIENTADA PARA A SUSTENTABILIDADE NOS SERVIÇOS DE SAÚDE

Reflections on sustainability-oriented innovation in health services

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RESUMO

O objetivo do estudo consiste em uma reflexão teórica sobre como a inovação orientada para a sustentabilidade (IOS) pode ser desenvolvida no contexto dos serviços de saúde. O formato do trabalho é um ensaio teórico baseado em pesquisa em periódicos que compõem a base de dados Scopus, utilizando os filtros Negócios, Gestão e Contabilidade. Dentre as contribuições do estudo, podemos citar a identificação dos fatores relacionados à adoção da IOS no contexto da saúde, destacando os principais e necessários aspectos para o desenvolvimento do SOI neste segmento. Pode-se propor um esquema conceitual de SOI, demonstrando que o caminho para se tornar uma organização sustentável passa pela articulação de processos de forma estratégica, o que envolve a necessidade de adotar um modelo de negócio sustentável que coloque a geração de valor da organização por meio do IOS.

Palavras-chave: Inovação Sustentável, Sustentabilidade, Serviços de saúde.

INTRODUCTION

Sustainability-oriented innovation (SOI) has called the attention of organizations and researchers in recent decades, as it addresses innovation from the perspective of sustainability, developed from environmentally and socially accepted aspects, which involves making intentional changes to the organization's philosophy and values, and either its products, processes or practices to serve the specific purpose of creating and realizing social and environmental value, in addition to economic return (Adams et al., 2016).

Knowledge about the dynamics of SOI projects is growing (Maier et al., 2020; Godin & Gaglio, 2019) and requires expansion, for example, in the field of administration (Pinsky & Kruglianskas, 2017), especially in Brazil (Carvalho et al., 2018). The expansion of its importance in the management field is a reflection of the organizations' increased perception concerning their benefits, such as differentiation, qualification, development of new products, processes and services, access to new markets, efficiency in the value chain, compliance, cost, and risk reduction (Carvalho et al., 2018; Bocken et al., 2015; Frondel et al., 2010; Nidumolu et al., 2009; Hart & Milstein, 2004), which contributes to the growth of legitimacy, reputation, and organizational performance (Varadarajan, 2015).

Most of the empirical studies that deal with the subject approach it in the context of manufacturing, in segments such as chemical (Cidón et al., 2020; Giovannini & Kruglianskas, 2008), sugar-energy (Sehnem et al., 2020; Carvalho & Barbieri, 2010), industrial (Kneipp et al., 2018; Medeiros et al., 2012; Gomes et al., 2009), agribusiness (Oliveira & Ipiranga, 2011), electrical and electronic (Kuhl et al., 2016), mineral (Ghassim & Bogers, 2019; Rosa et al., 2014), automotive metal mechanic (Severo et al., 2017), and textile (Koszewska, 2012). Studies that address sustainability-oriented innovation in services are more recent and with more theoretical approaches than studies on manufacturing (Martin-Rios et al., 2021; Calabrese et al., 2018). Research in tourism and hospitality has shown an important effort to broaden the discussion (Bressan & Pedrini, 2019; Horng et al., 2018).

In the services segment, the health sector plays an important role. Moreover, in this context, innovation has a strategic aspect, due to the strong relationship with research and development (R&D), especially in recent decades, with the emergence of new technological platforms related to biotechnology, nanotechnology, and information and communication technologies (Costa, 2016), a reflection concerning the interactions between scientific research and innovations in the sector and between the construction of an effective innovation system in the health sector and the economy (Costa, 2016; Pádua Filho et al., 2015; Barbosa & Gadelha, 2012).

Sustainability, in turn, is also directly related to the health area. To illustrate, we highlight some information demonstrating the sector's breadth in the Brazilian scenario. According to data from the General Register of Employed and Unemployed People (CAGED), in 2019, health and social services accounted for around 2.5 million jobs in the country, which corresponds to 9% of total employment in services, which is the economic activity that employs the most in the country, with about 56.70% of all formal employment relationships (Brasil, 2020). The representativeness of health services in the Brazilian labor market shows these activities' social and economic impact. According to the National Health Survey (PNS) carried out by the Brazilian Institute of Geography and Statistics (IBGE) in 2019, about 70% of the Brazilian population has access to health care exclusively through the Unified Health System (SUS), which, universally and free of charge, represents an important element of social impact, as it seeks to ensure health, one of the fundamental constitutional rights and which most organizations are at the service of, whether public, philanthropic or private.

Additionally, from an environmental point of view, health services are responsible for 0.76% of all urban solid waste collected in the country, which represented 552,948 tons in 2019, according to the Panorama of Solid Waste in Brazil 2020 (Abrelpe, 2020). Waste from health services represents an important part of total urban solid waste, not necessarily because of the absolute amount generated. However, because of the potential risk that it represents to health and the environment (Brasil, 2006), in addition to common waste, it generates biological, chemical, and radioactive waste and sharps and scarifiers, the treatment of which requires additional measures on the part of organizations.

Therefore, the study's objective is to carry out a theoretical reflection on how sustainability-oriented innovation can be developed in the context of health services. Due to the work format, which consists of a

theoretical essay, the choice of seminal authors was deliberately chosen, without the restriction of a period, carrying out the research in journals, which make up the Scopus database, using the Business, Management and Accounting filter. The texts were read in full and submitted to the interpretative analysis of the research authors, considering the recommendations of the qualitative approach, seeking to place them contextually and historically, and allowing the identification of aspects that may meet the objective of the present research.

In this sense, the association of innovation with the sustainability precepts that SOI proposes represents an important path for health organizations to develop in line with a sustainable agenda and with the potential to generate benefits for the organization and the actors and environments where they are inserted. Therefore, according to Kneipp et al. (2018), SOI must be related to a strategic and systematic posture concerning economic, social and environmental aspects and not just to isolated actions, which includes its incorporation into the business model adopted by the organization.

Among the study's contributions, we can mention identifying factors related to adopting SOI in the health context, highlighting the main and necessary aspects for developing SOI in this segment and suggesting a conceptual scheme developed from theoretical reflections.

1 THEORETICAL BACKGROUND

1.1 Innovation and Sustainability

The concept of innovation introduced by Schumpeter (1997) is fundamental to explaining economic development based on adopting innovation. The neo-Schumpeterian approach added new aspects to this concept over time, making its scope broader. The new approach was important for studying factors related to innovation. It brought a current of economic thought that highlights the existence of a competitive dynamic in which innovation is a central element of differentiation between companies (Sereia et al., 2015). It provides elements for discussing the evolutionary process of capitalist firms and understanding their dynamics and the economy, such as technological paradigms and trajectories, technological strategies, routines, selection, and search for innovations and learning processes (Dosi & Nelson, 1994).

The innovation can be a new product or service, a new production process technology, a new administrative structure or system, or a new plan or program concerning members of that organization. The different approaches encompassed by this concept demonstrate that innovation is a set of possibilities that the organization can use to differentiate itself and become competitive over time and even be one of the means of changing the organization, be it as a response to changes in its internal or external environment, or as a preventive action taken to influence an environment (Damanpour, 2010).

Although more recent than innovation, sustainability was incorporated into the organizational debate, seeking to question companies' contribution to sustainable development. To Hansen et al. (2009), sustainability challenges offer significant potential for innovation and possibilities for generating competitive advantage, based on the arguments that (a) new socio-environmental regulations increase the pressure for innovation capacity and (b) there are new business opportunities arising from cost reduction through increased efficiency, risk reduction, planning reliability, legitimacy, the attraction of new customer segments, and development of new products and businesses. This vision changes a restrictive concept, which some companies still adopt concerning sustainability, as being more of an expense, to associate it with the success of sustainable initiatives in large organizations, demonstrating that sustainability is a new frontier for innovation (Adams et al., 2016; Nidomolu et al., 2009). The role of sustainability concerning innovation has aroused the business community's interest in transforming challenges into business opportunities and new markets (Delmas & Pekovik, 2018, Bocken et al., 2015, Boons et al., 2013).

From an economic perspective, reconciling sustainability to innovation has attracted greater attention from organizational managers (Aka, 2019; Hansen et al., 2009), which points to a pressing need to equip managers with tools for innovative solutions to sustainability challenges (Adams et al., 2016) by using new technologies to sustain results and increase productivity (Pinsky & Kruglianskas, 2017).

Melane-Lavado and Álvarez-Herranz (2018) reinforce that sustainability can drive innovation. The association of innovation and sustainability with business performance has been discussed in several studies (Maier et al., 2020; Garlet et al., 2017; Santos & Silva, 2016; Lopez-Valeiras et al., 2015; Gunday et al., 2011), becoming essential for the survival of companies (Provasnek et al., 2017). Although innovation, under the sustainability bias, aligning innovation processes with sustainable development challenges has received increasing attention over the last few years. In the Administration field, Pinsky and Kruglianskas (2017) claim that there is an incipient production of innovation for sustainability, reinforcing the demand for research.

In addition, it discusses how organizations can promote the creation of shared sustainability values, largely through management actions that are more relevant to their stakeholders (Calabrese et al., 2018).

This research explores and describes the adoption of sustainability-oriented innovation in the organizational environment. It reinforces the combination between innovation and sustainability and highlights sustainability as an important driver of innovation in organizations (Godin & Gaglio, 2019). The choice for the concept of sustainability-oriented innovation lies in its focus on innovation based on the relationship it establishes with the sustainability tripod. The importance of each of these tripods in innovation development is treated without preference or neglect, emphasizing results. It benefits the greater the interrelation between them, which differs from the approach, for example, of eco-innovation, which has its attention turned to the environmental aspect, or social innovation, which emphasizes the reflections on social issues. In this sense, the first assumption of this study is *P1 - Sustainability drives innovation in organizations, establishing certain conditions for it to occur and inserting it in management due to external aspects related to sustainability, such as pressure from legal and social agents.*

1.2 Sustainability-oriented innovation

Whether due to external pressure and a sense of opportunity or awareness of purpose, sustainability is gradually added to the context of innovation in the organizational environment, including moral issues, environmental respect, participation of new populations and reflections on the consequences of innovation, giving it a normative character and making it a means to achieve a more sustainable society (Godin & Gaglio, 2019). Quist and Tukker (2013) emphasize the need for people from various areas to work together to challenge existing paradigms with innovative approaches to government and education and the provision of services and products by developing fair and sustainable systems and demonstrating the importance of the organization's external relations to make it more innovative and sustainable (Melado-Lavado & Álvarez-Herranz, 2018), which attributes to sustainability-oriented innovation a character of long-term reconstruction based on sustainable development.

The academic literature on sustainability-oriented innovation is recent, dating back to the last two decades. Authors point to the need for research that investigates how organizations can innovate to contribute to sustainability (Martin-Rios et al., 2021; Treptow et al., 2019; Melane-Lavado & Álvarez-Herranz, 2018; Delmas & Pekovik, 2018; Boons & Lüdeke-Freund, 2013; Andersen, 2008; Hellström, 2007). On the other hand, the pressure for organizations to become more sustainable has stimulated this debate. A major challenge is to find ways to innovate according to a new type of innovation that integrates sustainability issues (Hynds et al., 2014). The sustainability-oriented innovation scope has sought to meet this need as a strategic concept for creating value, generating competitive advantage, and improving the performance of either products or services (Melane-Lavado & Álvarez-Herranz, 2018; Adams et al., 2016; Boons et al., 2013; Boons & Lüdecke-Freund, 2013), which constitutes a guide for organizational managers to understand this phenomenon and the current organization's situation in the development of improvement plans in this sense (Hynds et al., 2014).

For this purpose, the economic, environmental, and social pillars of sustainability must be inserted in the organizational management model, applying to products, processes, services, technologies, structure, and the organization's business model to create value, ensure longevity and incorporate stakeholder concerns (Szekely & Strebel, 2012; Bos-Brouwers, 2010). Froehlich and Bitencourt (2015) endorse this position, stating that entrepreneurs and researchers have identified the need to expand studies on operationalizing the concept of sustainability in the organization's internal environment.

In addition to the characteristics mentioned above, SOI deals with innovations, whether new or improvements, related to organizational and marketing methods that aim to significantly reduce negative impacts and improve either positive, economic, environmental, or social impacts (Xavier et al., 2017).

In sustainability-oriented innovation management, it is important to understand which factors contribute to its adoption and development in the organizational environment. The sustainability-oriented innovation model by Adams et al. (2016) started as a response to regulatory stimuli translated through incremental change at the company level and has been triggering a growing radical change at the level of large-scale systems. Changing the structure requires a radical change in the organization's philosophy, values, and behaviors, reflected in the company's innovation activity (Adams et al., 2016). Based on a detailed literature review, Adams et al. (2016) suggested three conceptual dimensions of sustainability-oriented innovation (Table 1).

Table 1 - Dimensions of sustainability-oriented innovation

Dimensions		**Description**
Focus	Technique	Product-oriented and technically focused, promoting incremental adjustments in practice to meet environmental challenges. Set of technical tools rather than a matter of strategic management.
	Personnel	People-centered focus, where sustainability is treated as a socio-technical challenge that affects a range of elements, including, for example, technology, regulation, user practices and markets, cultural significance, infrastructure, and networked delivery.
Thought	Autonomous	Limited to departments, functions or individual products constituting increments to the dominant design under the logic of an additional activity.
	Integrated	Integrated across the company, through the culture, for example, by adopting product lifecycle thinking, integrated environmental strategies and environmental management systems so that it spreads throughout the organization as a strategic sustainability behavior.
The vision of oneself concerning society	Insular	Innovation is oriented towards internal issues, with environmental product development processes linked to the company and rarely to external processes.
	Systemic	Innovation is designed and driven to impact a socio-economic context in broader systems beyond the company's and stakeholders' boundaries.

Source: Adams, R. et al. (2016)

Sustainability-oriented innovation remains fertile for further studies and analysis that clarify how companies can facilitate its adoption. Therefore, the factors associated with its implementation and development follow this trend. In addition to internal factors, it is relevant to assess which aspects external to the organization influence this process and identify the relationships established by these two factors throughout the development of sustainability-oriented innovation in organizations.

In a review in the Scopus®□ database, scientific publications on factors related to sustainability-oriented innovation in organizations date back to 2016 and demonstrate the recent and growing interest in academic research on this subtopic.

Among the publications found in the search is the work of Aka (2019), who sought to understand how organization managers can develop sustainability-oriented innovation from the perspective of innovation as a process. The study analyzed the temporal and relational dimensions of the SOI development process. It sought to identify how it develops from interactions and transformations made by managers and stakeholders and what mechanisms these managers use to facilitate interactions and transformations throughout the process. Through theoretical and methodological tools of actor-network theory, it analyzed the development of a hybrid bicycle by a Canadian company. The findings pointed to the manager's role as a translator of sustainability in the development of SOI and to the need to be close to the interested parties to recognize the relevant issues for these heterogeneous actors, aiming to formulate shared sustainability values and minimize tensions in managing sustainability at different levels in time and space. The results showed that SOI is a matter of time and space whose management practices must consider the development of sustainable innovation as a synchronous process

that contemplates the different actors. The publication highlights the manager's role as a relevant internal factor for adopting and developing sustainability-oriented innovation.

Two other publications deal with the SOI antecedents and factors in the supplier network in the context of steel and engineering companies in South Africa (Bag, 2018; Bag & Gupta, 2017). The first, using the perspective of institutional theory, with validation of 11 of 13 factors identified through the literature: organizational culture, normative pressures, coercive pressures, mimetic pressures, buyer-supplier relationship, environmental policy, employee motivation, satisfaction between buyer and supplier, flexibility, green purchasing practices (Bag & Gupta, 2017). In the second publication, after listing 14 hypotheses related to the factors, only two of them were statistically validated by the study by Bag (2018): the effectiveness of the new product development team and leadership skills (McCosh et al., 1998), which can be translated as the establishment of smart goals for the R&D team and which should be regularly reviewed by senior management, in a combination and alignment between these two factors.

When examining the factors that influence the entrepreneur's choice of practices to develop sustainable business model innovation, Peralta et al. (2019) applied exploratory factor analysis based on data collected through a questionnaire in a population of Spanish entrepreneurs, in which they identified 11 factors that contribute to the adoption of practices for applying the model. Varadarajan (2015), in turn, seeking to identify antecedents related to the company and the industry for sustainability-oriented innovation, emphasized that the role of reputation favorable to sustainability can contribute to this process.

From these researched publications, it was possible to list the factors in Tables 2 and 3.

Table 2 - Internal factors related to sustainability-oriented innovation in organizations

Factors	Description	References
Behavioral intention	The relationship between intent and end-use. The founder's intention of a specific method (practice or technology) to develop a sustainable business model leads to the actual use of that method.	Peralta et al. (2019)
Organizational culture	Composed of traditions and values communicated within the organization, it influences how it behaves in the business environment. Positive values result in innovations and advances, strongly determining the organization's innovation strategy.	Bag and Gupta (2017)
Leadership skills	Leaders who drive the sustainability project across the company are accountable for any deviations in progress.	Bag (2018), McCosh et al. (1998)
Development team effectiveness	In-house research and development team for new products [or services] focused on creative developments.	Bag (2018)
Motivation for pleasure/ accomplishment	Enjoyment is perceived by using a method or technology to facilitate the development of a new sustainable enterprise or process, conducted through continuous improvement of work practices and personal efficiency.	Peralta et al. (2019), Bag and Gupta (2017)
Habit	The extent to which an individual believes that the behavior is automatic, previous experiences being an indicator for habit, as they form beliefs and influence behavior.	Peralta et al. (2019)
Agility	Agility in decision-making and response (adaptation and improvisation).	Peralta et al. (2019)
Financing	Need for financial resources to start or develop something.	Peralta et al. (2019)
Security	How the company copes with the degree of uncertainty.	Peralta et al. (2019)
Motivation for a sustainable entrepreneur lifestyle	The business originates from its founder's motivation for a more sustainable life.	Bressam and Pedrini (2019)
Company size	The larger the company, the more likely adoption is.	Varadarajan (2015)
Manager's role	Adoption of synchronous processes that suit their ways of doing things (e.g., organizational commitment, external collaborations, organizational flexibility, proximity to stakeholders and limited time).	Aka (2019)
Flexibility	Dealing with product mixes and volume changes, flexible procurement systems, and flexible workforce skills.	Bag and Gupta (2017)
Green purchasing practices	It considers environmental, social, and economic parameters in the acquisition decision.	Bag and Gupta (2017)

Source: Prepared by the authors.

The factors were segregated into internal, originating from actions and characteristics arising from the organizational environment, and external, resulting from elements beyond the organization's boundaries. The diversity of factors and approaches to SOI demonstrate the complexity surrounding the adoption of this perspective by organizations. In addition, the different theoretical and empirical sources on which these factors were raised give evidence and justify this variety to a certain extent. The review of factors carried out so far supports the second assumption of this study: *P2 - The adoption of sustainability-oriented innovation comes from construction based on different internal and external factors in the organization.*

Table 3. External factors related to sustainability-oriented innovation in organizations

Factors	Description	References
Performance expectation	Degree of belief about how using the system will lead to performance gains.	Peralta et al. (2019)
Effort expectation	The degree of ease of use of the system captures the entrepreneurs' feelings and experiences about the complexity of innovation in the sustainable business model.	Peralta et al. (2019)
Social influence	The degree to which the individual perceives that significant business stakeholders believe he or she should adopt sustainable practices.	Peralta et al. (2019)
Facilitating conditions	The degree to which the individual believes that an organizational and technical infrastructure exists to support the use of the system.	Peralta et al. (2019)
Cost/Price	The cost or economic burden along the stages of development of the new sustainable business model.	Peralta et al. (2019)
Level of globalization of the company	The more globalized, the more subject to a greater list of institutional pressures resulting from acting in different countries.	Varadarajan (2015)
Normative pressures	The company adopts a certain way of proceeding because it is considered right and true.	Bag and Gupta (2017), DiMaggio and Powell (1983)
Coercive pressures	The company complies with legal and regulatory requirements, which oblige it to adopt a certain practice by legal imposition.	Bag and Gupta (2017), DiMaggio and Powell (1983)
Mimetic pressures	The company adopts a practice of something understood as a good example, even if not consciously.	Bag and Gupta (2017), DiMaggio and Powell (1983)
Buyer-supplier relationship	Organizations invest in strategic suppliers to develop new products or components, for example, through annual contracts aimed at reducing costs, thus giving greater opportunity and confidence to suppliers for greater innovative results.	Bag and Gupta (2017)
Buyer-supplier satisfaction	A good buyer-supplier relationship generates satisfaction and strengthens relationships and investments.	Bag and Gupta (2017)
Reputation	Companies that enjoy a favorable reputation in several areas, such as innovation, product quality, customer trust and progressive organizational practices in the pursuit of sustainability.	Varadarajan (2015)

Source: Prepared by the authors.

2 INNOVATION AND SUSTAINABILITY IN SERVICES

The approach related to innovation and sustainability in service organizations is a topic that requires further study, as noted by Calabrese et al. (2018) in a literature review covering publications between 2004 and 2015. When associated with the three pillars of sustainability, service innovation emphasizes the dimension of innovation linked to innovation systems, demonstrating the importance of developing and orchestrating partnerships and value-creation networks through sustainable services (Kindström et al., 2013), which is one of the reasons why it is a more challenging context to be analyzed compared to industries. Furthermore, it demonstrates that developing SOI in services is strongly linked to the organizational dimension of innovation, permeating processes, products, and the business model.

Calabrese et al. (2018) propose an umbrella called "sustainability-oriented service innovation (SOSI) as a multidimensional concept that captures the different elements of new service solutions that address environmental, social, and economic issues, seeking to gather and share under the same name and guiding concept, something that encourages research on the topic.

Among the studies that explore the question of sustainability-oriented innovation in services, longitudinal research in the hotel sector of small and medium-sized accommodation companies sought to identify whether SOI can be applied in this type of service and to establish insights on sustainability behaviors and type of innovation (Warren et al., 2018). Among the insights, the possibility for SOI to create opportunities for co-creation and customer experiences was highlighted in the study. In this case, the guest was highlighted. Companies in this segment have been identified as pioneers in service design in a world of social change and sustainable lifestyles (Warren et al., 2018).

Regarding the 17 Sustainable Development Goals (SDGs) and the contribution of organizations to their achievement, a study proposed a tool to support the transition to sustainability in companies (Calabrese et al., 2018) based on the SOSI concept (Calabrese et al., 2018). The research distinguished the innovation process through a tool specifically focused on the assumption that sustainability transitions are valuable opportunities to stimulate service innovation (Martin-Rios et al., 2021). The study was derived from the Engineering Design Process, considered one of the important types of innovation to consider environmental, social and economic issues holistically (Enquist et al., 2015).

In the research developed by Calabrese et al. (2018), SOI proved to be a practical guide to identify in which component(s) of a business model there is more possibility of developing this type of innovation, thus aiming to serve new markets and new customer segments and, consequently, gain a competitive advantage. Calabrese et al. (2018) concluded that the tool improves the current understanding of innovation guidelines in services with a sustainable bias but still needs more empirical studies for its validation on a larger scale.

In the field of tourism and hospitality, in which there are recent efforts aimed at discussions on SOSI, a publication deals with the materiality of the service and its incentive and promotion of sustainability in tourism, based on the theory of the historical structure of the nature of services and the concept of life cycle thinking (Volpi & Paulino, 2018). With a focus on the environmental performance of services, the results of this study showed that the main sources of the materiality of accommodation services are in the material support for the provision of services, such as goods either used or processed to meet the demands of guests, the physical facilities (rooms, bathrooms, suites, restaurants, swimming pools, laundry) and other material systems (equipment, heating, refrigeration, food cooking systems). Through a literature review, the study pointed out that the sources of the materiality of this type of service are associated with environmental aspects, which may become a path for the development of innovation in sustainable services.

From the user's perspective, another study addressed this perspective as an important source of innovation, especially concerning services, calling it user innovation, innovation conducted by users (Trischler et al., 2020). The article conceptualizes the diffusion of user innovations from a service ecosystem perspective, considering this a possible theoretical basis for the adoption and diffusion of user innovations. The service ecosystem, in this sense, contributes to innovation as a multilevel phenomenon, in which there is no attribution of specific functions because all actors are "resource integrators" for value co-creation and the diffusion of innovation is focused on the changes that can create value by integrating existing resources rather than seeking new ones. The study concludes that adopting innovation diffusion from the user's perspective still needs to be explored. It adds that innovation policies, regulations and the financing structure are barriers to developing an innovation ecosystem from these bases. However, it is still clear that the analysis and discussion remain centered on the theoretical field to bring together what has been produced on sustainability-oriented service innovation under the same umbrella of concepts.

One cannot fail to highlight the effort some segments, such as tourism and hospitality, have made in this direction. New perspectives for the development of the theme are also identified, such as the publication by Trischler et al. (2020) that sheds light on the user's role, a fundamental element for organizations based on services, and the effort to bring characteristic elements of the study of services to the discussion of the incorporation of SOI in this universe.

3 INNOVATION AND SUSTAINABILITY IN HEALTH SERVICES

Concerning health services, there is an expectation that they will act in a way that improves the patient's experience, improves the population's health, and maintains or reduces costs. However, most organizations in this segment must prepare to achieve these three goals (Fredriksson, 2018). Thus, a trend relates to the idea that the more (technology, interaction, and intervention), the better health (Costa, 2016). This perception is related to a consumerist practice that permeated health systems, documented by disseminating innovations without proven effectiveness, leading to increased costs of systems and the observation of iatrogenic effects (Lorenzetti et al., 2012). Demographic changes and the characteristics of health and disease processes have raised concerns about the sustainability of universal health systems worldwide. Therefore, authors recognize that advances in the health innovation system have implications for the economy and society (Proksch et al., 2019; Gadelha et al., 2012).

By studying the specific aspects of how the healthcare organization is organized, it is possible to identify its ability to adapt to the environment in which it operates and to integrate new management concepts. Health has a particularity because it constitutes a link between the national systems of innovation and those of social welfare (Costa, 2016).

On the one hand, in the field of sustainability, health services are permeated by strong legal regulation on environmental aspects, have a social impact on the region in which they are inserted, and, given the growing demand for services, partly resulting from aspects of demographic growth, longevity and change in the epidemiological profile of the population, show its close relationship with sustainability. On the other hand, intense technological pressure, which involves the context of innovation in these organizations, makes SOI an alternative that seeks balance between these forces.

Few companies and corporate leaders recognize the importance of promoting a green economy and the need to reinvent the business dynamics that consider sustainability in their business strategy (Kruglianskas & Pinsky, 2014). In health services, this is the same. Studies that seek to analyze organizations that are steps ahead of others in this journey in health services can give clues on how it is possible to encourage the sector in this direction. For companies to contribute substantially to this issue, managers must better understand how to drive innovations toward sustainability (Luqmani et al., 2017).

In a study conducted in a large private hospital in Porto Alegre (RS), Froehlich et al. (2018) sought to verify whether institutionalized innovations in the organization could be considered sustainability-oriented. The results showed that the organization develops innovation practices that contribute to sustainability. However, they did not occur systematically according to the pillars of sustainability. This finding demonstrates the current SOI stage in health services, indicating the need to articulate practices and include them in the organization's management.

Another study analyzed the sustainable approach in health supply chains, proposing an evaluation guide focused on SOI and a decision-making framework for health managers seeking to improve sustainability (Elabed et al., 2021). The study concluded that adopting or creating practices and innovative solutions allow health organizations to improve patient care performance and quality. The dynamic nature and complexity of the health sector require the effective management of supply chains to achieve sustainability. It highlights that (a) health managers consider environmental initiatives and awareness the most important criterion for achieving SOI in hospitals. However, (b) there is a lack of clarity in the general understanding of the SOI concept in the health context, as it is limited to tangible products and technologies, (c) the SOI concept must be an approach that requires sustainability to be rooted in the hospital culture, which is not yet a reality, and, finally, (d) the need for greater knowledge of SOI in health supply chains.

Although under a focus on responsible innovation in health, Lehoux et al. (2019) sought to document what is known about the demand of health systems for innovations. Among the study's main conclusions is the need to reduce the cost of innovative production processes and address not only the requirements of the immediate clinical context of use but also the vulnerabilities of the broader system in which innovations are implemented. In countries with low and medium Human Development Index (HDI), these vulnerabilities reside in problems with infrastructure, logistics and equipment. In medium to high HDI countries, they are associated with growing demand for medicines and new technologies and managing rising costs. In all countries, they are

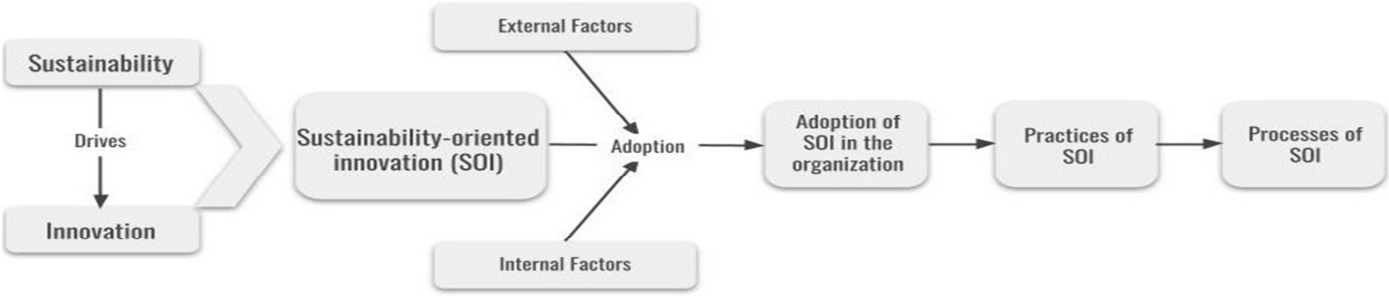
generally associated with the need for flexible information technology solutions, which demonstrates the need to incorporate the SOI concept broadly and systematically into the segment since innovation under sustainable bases is essential for the future of health organizations to remain competitive and viable.

However, it is possible to verify that studying SOI in service-oriented organizations reserves numerous possibilities for studies, approaches, and analyses with various future research agendas, especially in health organizations. Studies focusing on the application of SOI in health organizations are even more scarce, with several points to be studied and deepened. The literature review carried out in this section leads to the third assumption of the study: *P3 - The adoption of sustainability-oriented innovation in services is linked to the customer's contribution and the need to include him in this process, as well as the need to materialize the elements of this adoption in services.*

Given the limitation of literature focused on the health segment, the third assumption remains from the perspective of service organizations. However, attention falls on health organizations, given their relevance and importance, as explained in the introductory part of the work.

In addition to originating the assumptions presented here, the literature review for this work also served as a basis for constructing a conceptual scheme to represent how and in what way SOI can be adopted by the organization (Figure 1).

Figure 1 - Conceptual scheme



Source: Designed by the authors.

In the conceptual framework, SOI results from innovation driven by sustainability, which promotes innovation on the basis that integrates economic, environmental, and social aspects. The organization initially adopts SOI by incorporating practices based on the stimuli of internal and external factors that, later, are articulated in structured processes that deepen its presence in the organization and deliberate it for the stages of strategic adoption. However, the factors that stimulate the adoption of SOI differ from organization to organization and the practices and processes developed. The detailed study of this phenomenon in a health service organization seeks to explore and describe how it occurs in this type of organization and advance the SOI analysis in this context.

CONCLUSION

This research sought to reflect on how sustainability-oriented innovation can be developed in the context of health services. The health sector has a *sui generis* position as a link between national innovation systems (to drive the technological progress that underpins the growth and wealth of nations) and social welfare systems (to enhance the populations' quality of life and mitigate social inequality), which makes scientific research in this field relevant, and the advances generated in the health innovation system reflect on the economy and society as a whole (Proksch et al., 2019; Gadelha et al., 2012).

Three analysis assumptions can be established that guided the critical reflection and a path to understanding SOI; that is, it starts from an external perspective, from legal pressure and from society from the long-term needs of maintenance, conservation, and support, which drives the need to change production systems. This perspective is influenced by external and internal facts that shape the daily life of organizations conditioned

to sustainable organizational efficiency and effectiveness, relativized from adopting practices and processes to delivering agreed services and participation to clients in the health sector.

Therefore, a conceptual SOI scheme can be proposed, which demonstrates that the way to become a sustainable organization passes through the articulation of processes in a strategic way, and that involves the need to adopt a sustainable business model that places the creation of value for the organization through SOI as strategic.

The study's contributions are identifying factors related to SOI, indicating a possible path for, and advancing in the academic-scientific development of the theme.

The study's limitations are associated with the database used to survey the theoretical construction. In this sense, it is possible to suggest expanding access to other databases, including literature from different areas, since the idiosyncratic nature of sustainability is considered. In addition, research is suggested in empirical environments that can take the conceptual scheme as a starting point, seeking proximities and associations with the proposed approach.

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