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ORGANIZATIONAL CONTEXT FOR CIRCULAR-ORIENTED INNOVATION

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Purpose: In recent years, circular innovation has been gaining increasing attention in the management literature. The popularity of this research stems from the fact that the concept of Circular-Oriented Innovation fills a gap in operationalizing a company's transition from traditional (linear) to alternative (circular) product and service systems. Recent research further suggests that due to its complexity – resulting from fundamentally redesigning production, processes, and organization – the successful implementation of Circular-Oriented Innovation may require different contextual factors than studies relating to traditionally framed innovation have shown. Given the still inadequate academic knowledge in this area, the paper proposes a new conceptualization of organizational context elements crucial to the effective implementation of Circular-Oriented Innovation.

Design/methodology/approach: The paper is theoretical and cognitive, grounded in an extensive literature review encompassing theoretical, review, and empirical studies on understanding Circular-Oriented Innovation and its determinants. The paper's insights enrich the existing literature and enhance comprehension of innovation based on the circularity rationale. Moreover, they underscore the imperative for additional scientific endeavors, particularly comparative studies and empirical validation of the developed conceptual model.

Findings: The paper proposes that the effective implementation of Circular-Oriented Innovation results from the interplay of three key elements of the organizational context. Thus, it requires the simultaneous adoption of a circular strategic orientation, the mobilization of the CE-related resources and capabilities, and collaboration with stakeholders throughout the value creation chain. An extension of the theoretical structure of the model, resulting from the necessity of the systemic nature of Circular-Oriented Innovation postulated in the literature (i.e., making changes in all dimensions of the companies' operations), is also the inclusion of (linking the various contextual elements) organization-al processes, i.e., organizational learning processes, strategic foresight, and design processes, as well as internal and external collaborative processes.

Originality/value: The scientific contribution of the paper is the conceptual framework of crucial elements of organizational context that stimulate the effective implementation of Circular-Oriented Innovation, which goes beyond existing literature narratives on the implantation of Circular Economy principles at the organizational level. The proposed theoretical framework, taking the form of a 'dynamic triangle', aims to develop a new way of thinking about the contextual determinants of Circular-Oriented Innovation and is an original

contribution to management theory, reorganizing the potential processes that are crucial to the implementation of such innovations in all dimensions of companies' operations.
Keywords: Circular-Oriented Innovation, organizational context, theoretical framework.
Category of the paper: Research paper.

1. Introduction

One of the many research areas that aim to find ways for companies to deal with sustainability challenges is the Circular Economy (CE) concept, indicating the need for a systemic change in the basic logic of how companies conduct their business (Bocken et al., 2016; Rodriguez-Espindola et al., 2022; Geissdoerfer et al., 2020) into one that considers the consequences of the previously ignored natural limits of economic growth (Sehnem et al., 2022; Pichlak, 2023). The idea postulated in this concept of narrowing, slowing, or closing resource loops (Bocken et al., 2016; Rodriguez-Espindola et al., 2022) means implementing a system in which pro-environmental changes run parallel to economic and social changes (Bocken et al., 2014).

At the core of the CE concept is the recirculation of resources (Ormazabal et al., 2018), i.e., the creation of feedback cycles (resource-product-resource) by narrowing, slowing, or closing the loops of their flows (Bocken et al., 2016; Brown et al., 2021), according to the 3Rs principle (reduce, reuse, recycle). Reducing (narrowing the resource loops) means that it is possible for a given production level to reduce inputs and increase production efficiency simultaneously. Reusing (slowing the resource loops) involves extending the life of products based on recirculating processed materials so that they become inputs in subsequent production processes. Finally, recycling (closing the resource loops) indicates that waste can be transformed for further use (Ghisellini et al., 2016; Pichlak, Szromek, 2022; Sehnem et al., 2022).

For several years, there has been a growing body of literature on implementing CE concepts at the organizational level (Lüdeke-Freund et al., 2019; Pieroni et al., 2019; Stucki et al., 2023). These analyses focus on the broad and multidimensional identification of factors (Cento-belli et al., 2021) and barriers (Kirchherr et al., 2018; Takacs et al., 2022) to the adoption of circular actions by companies and prove that when designing the research process, researchers should change the level of analysis from a macro to a microeconomic perspective (Stucki et al., 2023). However, the overarching implication from these valuable studies is that adopting CE at the organizational level requires implementing Circular-Oriented Innovation (COI). The concept of COI boils down to undertaking 'the coordinated activities that integrate CE goals, principles, and recovery strategies into technical and market-based innovations, such that the circular products and services that are brought to market purposively maintain product integrity and value capture potential across the full life-cycle' (Brown et al., 2019, p. 3).

The practical implementation of the CE concept at the organizational level accomplished through Circular-Oriented Innovation requires systems thinking (Bocken et al., 2018; Brown et al., 2021; Bocken et al., 2016; Suchek et al., 2021). Such a perspective is not limited to designing and implementing individual innovations and reaping certain benefits from them. It requires a complete reorganization of the activities carried out by companies to separate value creation and resource use and, as a result, reduce negative environmental impacts. The demand for a systemic conceptualization of COI is not new, and researchers point to several practical ways to achieve such holistic changes. Bocken et al. (2016) describe specific strategies for product design and business models that can be useful for companies looking to design systems in line with the CE paradigm. Brown et al. (2019) point to an alternative path for systemic implementation of COI in organizations such as undertaking collaboration; the researchers' analysis includes a detailed characterization of the factors and barriers to implementing Collaborative Circular-Oriented Innovation.

Since Circular-Oriented Innovation is concerned with the systemic design and implementation of pro-environmental changes at all levels (product, process, organization, business model), it is, therefore, crucial to identify the organizational context that not only provides the framework for the fundamental – and at the same time consistent with the CE paradigm – reorganization of companies' activities, but is also determined by circular ideas. Also, recent research suggests that COI may require different contextual factors than those identified in research on traditional innovation (Mead et al., 2022). Accordingly, this paper develops a new conceptualization of organizational context critical to the effective implementation of Circular-Oriented Innovation. The basis for achieving such a research objective was to conduct an in-depth literature study – including theoretical, review, and empirical papers – the results of which indicate that implementing COI requires simultaneously developing a circular strategic orientation, mobilizing the CE-related resources and capabilities, and undertaking collaboration with stakeholders along the entire value creation chain. The proposed theoretical framework, taking the form of a 'dynamic triangle', aims to develop a new way of thinking about the contextual determinants of COI and also makes an original contribution to management theory by reorganizing potential processes crucial to the systemic development and implementation of Circular-Oriented Innovation.

2. Theoretical Background

2.1. The origin of Circular-Oriented Innovation

The notion of Circular-Oriented Innovation has its origins in the broad research stream on eco-innovation, with many valuable contributions, including multidimensional analysis of its

specifics (e.g., Carrillo-Hermosilla et al., 2010; Kiefer et al., 2017); identification of its determinants (e.g., Pacheco et al., 2017; Bitencourt et al., 2020) and the effects of its implementation (e.g., Zhang and Walton, 2017; Cai and Li, 2018). Awareness of the vital importance of eco-innovation has fostered an intensification of academic research in this area. The large number of studies on the subject has led to the emergence of related terms, i.e., green innovation (Huang, Li, 2017), environmental innovation (Kammerer, 2009), sustainable innovation (de Medeiros et al., 2014) or sustainability-oriented innovation (Klewitz, Hansen, 2014; Mead et al., 2022). These studies adopted different theoretical perspectives, were conducted in different contexts, and yielded different results (cf. meta-analytical review by Bitencourt et al., 2020; systematic literature review by Hermundsdottir and Aspelund, 2021). Although the definitional complexity of the terms mentioned above has been the subject of several valuable research analyses (Schiederig et al., 2012; Díaz-García et al., 2015), some researchers have included them as synonyms (Sáez-Martínez et al., 2015; Hermundsdottir, Aspelund, 2021).

However, the uniqueness of Circular-Oriented Innovation sets it apart from other types of innovation, such as green-, sustainable- or eco-innovation. COI encompasses a much broader conceptual scope, referring to the fundamental transformation of product, process, and organization (Rodriguez-Espindola et al., 2022). In essence, it necessitates the creation of a new business architecture that integrates a holistic combination of product, process, and organizational eco-innovation. This approach enables the implementation of the 3Rs principle central to CE in business practice (Blomsma et al., 2019; Brown et al., 2019; Brown et al., 2021).

Bringing the CE concept to reality at the organizational level is accomplished by developing circular products, which have longer life cycles than conventional ones (Franzo et al., 2021; Bocken et al., 2016; Lewandowski, 2016) based on their reusability or recyclability (Urbinati et al., 2019). The development of circular products relies primarily on the use of specific materials, e.g., biodegradable materials (Fernandez de Arroyabe et al., 2021), and, in the absence of their availability, requires efforts focused on circular processes that address CE's core paradigm of creating closed production and consumption systems (Lüdeke-Freund et al., 2018; Fernandez de Arroyabe et al., 2021). Such processes aim to eliminate waste and, in the long term, significantly reduce the use of non-renewable raw materials. This objective is also served by solutions that promote the sharing of environmental responsibility by consumers (de Medeiros et al., 2014; Lewandowski, 2016), referring, among other things, to 'designing for emotional durability' (Bocken et al., 2016), as well as measures that support shared consumption (Franzo et al., 2021). Finally, valuable tools for implementing the Circular Economy are organizational changes made through environmental management systems, which facilitate the identification and realization of cost savings and improvements in the potential level of efficiency of sustainable companies (Hojnik, Ruzzier, 2017).

2.2. The organizational context as a framework for implementing COI

In order to convert the CE concept into practical activities leading to the implementation of Circular-Oriented Innovation, the leaders must define and communicate to the organizational members a transparent and integrated circular vision that forms the basis for decision-making concerning the strategic direction of the company's future development (Blomsma et al., 2019). In this approach, the shared and ecological vision formulated by the leaders becomes part of the organizational identity and, as a result, justifies the need to design COI and deter-mines the potential scope of its implementation. The literature emphasizes the importance of a shared vision in innovation projects (Jansen et al., 2008; Blomsma et al., 2019). Researchers indicate that a defined shared vision is a crucial guidepost for designing Circular-Oriented Innovation at intra- and inter-organizational levels (Brown et al., 2019; Blomsma et al., 2019). Bocken et al. (2016) describe a range of circular product design strategies and Circular Business Model Innovation, indicating that companies must start with an overall vision be-fore developing in detail their circular business model and circular product design strategies. Mead et al. (2022) go even further and point out that Sustainability-Oriented Innovation is integral to a company's vision and overall long-term strategy. This notion also aligns with the arguments of Dangelico and Purjari (2010), for whom converting the core vision into the company's strategy is essential for success in taking concerted action leading to COI. Therefore, a critical contextual element necessary for Circular-Oriented Innovation is the strategic priority set by leaders. COI requires innovation at all levels of the business creation architecture, but most importantly, it requires changes in corporate strategy. Circular-Oriented Innovation should not be understood as 'sustainability and thus as cost agenda' but as 'central business agenda' (Eisenreich et al., 2021). The literature has widely discussed the significance of eco-innovation strategies. The most de-tailed typology presents Klewitz and Hansen (2014) and describes resistant, reactive, anticipatory, innovation-based, and sustainability-rooted strategies. Such sustainability-rooted strategies require a 'shift in the dominant worldview' and 'an ecocentric deep-ecology approach', and thus can be a critical contextual determinant for implementing Circular-Oriented Innovation. Blomsma et al. (2019) develop a taxonomy of circular strategies, considering the ReSOLVE, Performance Economy, Cradle-to-Cradle, or Waste Hierarchy frameworks, among others.

Since Circular-Oriented Innovation represents a continuous, radical, and organization-encompassing process of innovation and transformation (Brown et al., 2019), therefore the selection of a specific strategy requires the CE-related resources, competencies, and capabilities, i.e., information systems, technical systems, or accumulated organizational knowledge. Internal competencies and capabilities can be seen as lenses through which a company observes its environment (Hansen et al., 2002). Therefore, what is essential concerning Circular-Oriented Innovation is the resources and competencies a company possesses and the ability to improve them continuously (Fernandez de Arroyabe et al., 2021).

This conceptualization of the organizational context goes beyond the static view that characterizes the Resource-Based View of the Firm (RBV) toward adopting a dynamic perspective (Sehnem et al., 2022). According to the leading work of Teece et al. (1997), dynamic capabilities constitute higher-order capabilities and refer to the building, integrating, and reconfiguring of internal and external skills, resources, and functional competencies held within a company to meet the demands of a rapidly changing market environment. Building such capabilities is therefore particularly relevant to Circular-Oriented Innovation because the organizational learning processes underpinning its development enable the transformation of existing and the creation of new business models. These models are essential for efficiently using the resources and ultimately closing material loops (Bocken et al., 2019; Geissdoerfer et al., 2020). De Mederios et al. (2014) argue that critical to the success of Sustainability-Oriented Innovation is the development and maintenance of an innovation-oriented learning culture. Brown et al. (2019) point out that building such a capability, including aligning one's vision, developing competencies, and enabling reflexive analysis through innovation (De Mederios et al., 2014), is also critical for implementing COI.

Implementing Circular-Oriented Innovation requires resources, competencies, and capabilities, often impossible to build, especially by companies that operate on traditional business models (Prieto-Sandoval et al., 2019; Johnson, 2022). Hence, a vital element of the organizational context for COI is the establishment of cooperation with external stakeholders (Eisenreich et al., 2021; Johnson, 2022). As the Circular Economy represents an economic model leading to closed production and consumption systems and is widely viewed by researchers as collaborative (Brown et al., 2019; Prieto-Sandoval et al., 2019; Fernandez de Arroyabe et al., 2021), hence the involvement of key stakeholders (i.e., customers, suppliers, technical experts or research and development institutions) is particularly important for systemic COI implementation (Eisenreich et al., 2021). The literature emphasizes that the establishment of strategic cooperation by companies with supply chain partners determines the implementation of the 3Rs principle (Blomsma et al., 2019; Brown et al., 2019; Brown et al., 2021; Suchek et al., 2021). Analyzing collaboration with different stakeholders, Rajala et al. (2018) identify three archetypes of circular systems, i.e., inner circles, decentralized systems, and open systems, while Eisenreich et al. (2021) point to the importance of three primary forms of collaboration (dyadic alliances, network relations, and crowdsourcing) for generating and implementing innovative circular solutions. Dyadic alliances involve long-term and often formal interaction with a single partner; network relations extend these partnerships and are concerned with building networks of interactions with various independent entities, while crowdsourcing involves interaction within much broader communities and is done through, for example, virtual co-creation platforms. The main motives for establishing collaboration in the context of Circular-Oriented Innovation include the opportunity to share critical resources, skills, and knowledge (Sehnem et al., 2022), improve efficiency, reduce costs and shorten time-to-market for circular products (Bititci et al., 2006), and – or most importantly – the desire

to become a 'CE leader' based on reputation building and the search for new business opportunities and markets through the experimentation (Brown et al., 2019).

Based on the in-depth literature review, implementing Circular-Oriented Innovation requires the simultaneous development of a circular vision, adoption of a circular strategy, mobilization of critical resources and capabilities, and collaboration across the value creation chain. Figure 1 presents a conceptual framework capturing the three vital elements of the organizational context leading to the implementation of COI. Based on Hansen et al.'s (2002) conceptualization of environmental innovative capability, the organizational context for COI are presented as a 'dynamic triangle'.

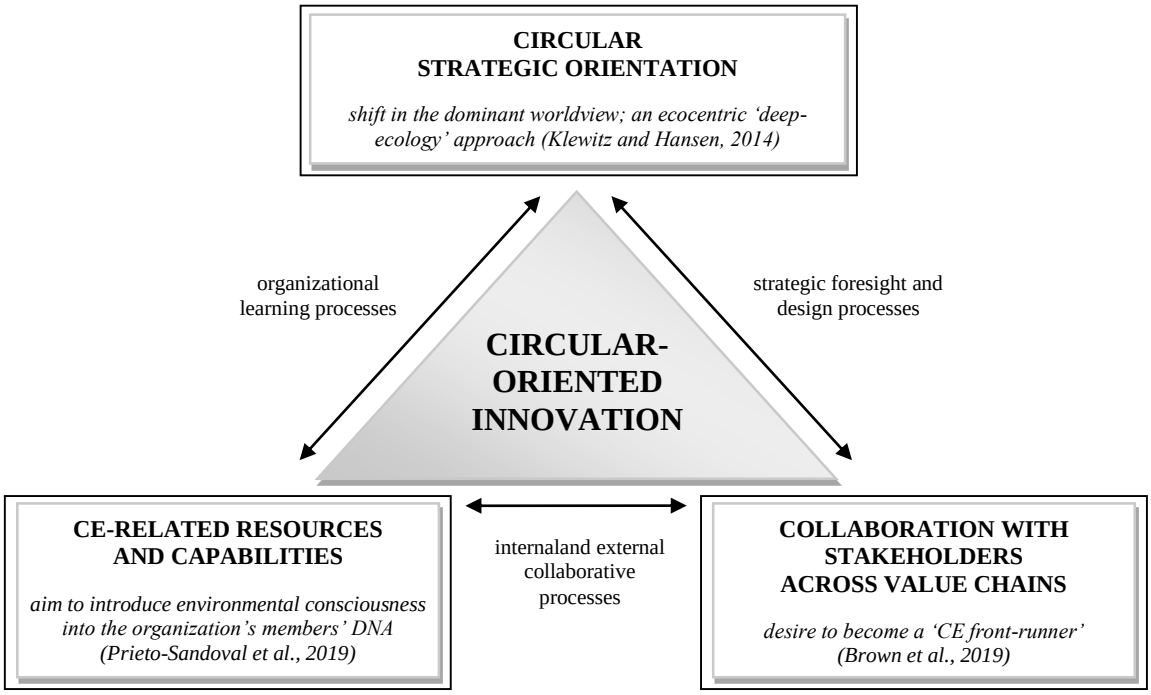

Figure 1. Organizational Context for Circular-Oriented Innovation – the theoretical framework.

According to the conceptual framework, the implementation of COI results from the interplay of critical contextual factors. Integrating CE goals and principles into organizational practice requires adopting a circular strategic orientation, mobilizing the CE-related resources and capabilities, and collaborating with stakeholders across value chains. In addition, the successful design and implementation of Circular-Oriented Innovation involves maintaining organizational systematicity, developing organizational learning processes, strategic foresight and design processes, and internal and external collaborative processes.

Organizational learning processes are a reference point for making critical strategic choices, and, on the other hand, they can prevent the occurrence of so-called 'strategic blindspots' (Teece et al., 1997), thus facilitating the implementation of COI by strengthening existing and building new organizational capabilities (Johnson, 2022). In addition, the systemic nature of COI enforces the implementation of strategic foresight and design processes necessary for 'mapping' the system and creating CE strategies. These processes 'should connect goals,

motivations and interrelationships between the market, potential technologies, and required resources to identify those processes that may require external partners to realize the COI' (Brown et al., 2021:3). Finally, since COI involves using resources embedded in inter-organizational activities and procedures and the collaborative learning of employees working together, the proposed conceptualization includes internal and external collaborative processes. Such processes not only enable access to new or complementary resources held by collaborative partners but also open up the possibility of achieving the benefits associated with the occurrence of complementarity effects in the context of organizational learning and sharing knowledge regarding COI.

3. Conclusions

The Circular Economy concept, which is one of the pathways for companies to deal with the challenges of sustainability (Bocken et al., 2016; Pieroni et al., 2019; Rodriguez-Espindola et al., 2022), represents a strategic paradigm shift in how they conduct business (Prieto-Sandoval et al., 2019) and signifies the replacement of the traditional linear model of resource management (Ormazabal et al., 2018) with a model leading to the creation of a regenerative system (Bocken et al., 2016; Eisenreich et al., 2021).

At the core of the CE concept, the 3R (reduce, reuse, recycle) principle means taking actions aimed at narrowing or slowing the resource loops in industrial ecosystems (Bocken et al., 2016; Brown et al., 2021) and ultimately closing them by changing the value generation process (Pieroni et al., 2019). The popularity of the CE concept caused the original 3R principle to be extended first to the 4Rs, then to the 6Rs, and later on evolved to the 9R concept and even to the 12Rs (considering recover, refuse, rethink, repair, refurbish, remanufacture, repurpose, redesign, research). However, the existence of various alternative R-strategies remains the same logic of CE understanding, implying the need to create economic, social, and environmental value (Pichlak, Szromek, 2022).

The fulfillment of CE principles is accomplished through Circular-Oriented Innovation, which justifies undertaking research in this new research stream. Successful implementation of COI is based on indicators of long-term ecological and economic efficiency (Sehnem et al., 2022) and refers to implementing environmental changes in the company at all levels of business strategy (Brown et al., 2019). By narrowing, slowing, or closing resource and material loops, this fundamental redesign of processes, products, and value-creation system should ultimately reduce the negative environmental impacts that naturally follow the production and consumption of physical goods (Fernandez de Arroyabe et al., 2021).

Since Circular-Oriented Innovation is related to systemic organizational changes and thus goes beyond traditional innovation research (Mead et al., 2022), it requires a rethinking of the organizational context necessary for its effective design and implementation. This issue is an ever-evolving field of research, which makes it still in the conceptualization phase. Therefore, the primary purpose of this paper was to add to the existing literature by proposing a conceptualization of the essential elements of organizational context for COI. Following the logic of Hansen et al. (2002), the paper considers three vital contextual factors in the form of a 'dynamic triangle', the construction of which indicates that taking action leading to the systemic integration of CE goals and principles into organizational practice must be done in an integrated manner. It requires simultaneously adopting a circular strategic orientation, mobilizing the CE-related resources and capabilities, and undertaking collaboration with stakeholders across value chains in which the circular economy is implemented.

Designing and implementing Circular-Oriented Innovation in companies implies a new way of thinking about innovation, as it requires the development of a new circular vision and the formulation of a circular strategy as the basis for fundamentally redesigning product concepts, service offerings, and industrial processes toward solutions with a long lifecycle. However, systemic creation and implementation of COI in all dimensions of companies' operations (Brown et al., 2019; Brown et al., 2021) can be risky, especially when companies lack experience in circular operations (Johnson, 2022). Therefore, effective implementation of Circular-Oriented Innovation requires developing specific resources, competencies, and capabilities, particularly dynamic capabilities. The building of these capabilities stems from the development history of the organization, and the process of improving them is done cumulatively by intensifying organizational learning and expanding the existing knowledge base (Sehnem et al., 2022). Finally, companies are forced to interact within broader ecosystems to effectively implement COI, moving from a company-based operational logic to one focused on collaboration across the value creation chain (Pieroni et al., 2019).

In summary, the paper is theoretical and cognitive, and its main scientific contribution refers to conceptualizing Circular-Oriented Innovation from the perspective of its crucial contextual factors. The relevance of exploring the organizational context for COI is not only theoretical. Conducting such analyses is also essential for managers developing business strategies based on Circular-Oriented Innovation, thus adapting their companies' ongoing production (or service) activities to increasingly stringent regulatory standards and dynamically changing societal demands.

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