

## VALUE CREATION AND CAPTURE IN INNOVATION ECOSYSTEMS

criação e captura de valor em ecossistemas de inovação

Creación y captación de valor en ecosistemas de innovación

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### Abstract

**Objective of the study:** The objective of this theoretical essay is to propose an integrative framework for analyzing value creation and capture in innovation ecosystems.

**Methodology:** This is a theoretical essay based on a narrative review of the concepts of innovation ecosystems, value creation, and value capture.

**Originality/Relevance:** The article theoretically contributes to the analysis of value creation and capture by comparing and contrasting the platform and territorial approaches in innovation ecosystems.

**Main results:** In analyzing the creation and capture of value in innovation ecosystems, the theoretical similarities and differences between the territorial and platform approaches must be considered. Thus, strategies for creating and capturing value must be designed procedurally, according to each stage of the innovation ecosystem's life cycle. Furthermore, value creation and capture strategies must be aligned, and actors must develop individual and collective mechanisms to create and capture the value in the innovation ecosystem, which can be viewed as a multidimensional value (economic, social, cultural or environmental).

**Theoretical/methodological contributions:** The article provides a conceptual framework as well as six theoretical propositions for analyzing value creation and capture in innovation ecosystems.

**Social/management contributions:** The article assists companies, governments, universities, and non-governmental organization managers in considering both the creation and capture of value as drivers for action in innovation ecosystems.

**Keywords:** Regional innovation. Value appropriation. Innovation ecosystem coordination.

### Resumo

**Objetivo do estudo:** O objetivo deste ensaio teórico é propor um framework integrativo para análise da criação e captura de valor em ecossistemas de inovação.

**Metodologia:** Este artigo trata-se de um ensaio teórico elaborado a partir de uma revisão narrativa dos conceitos de ecossistemas de inovação e criação e captura de valor.

**Originalidade/Relevância:** O artigo contribui teoricamente para a análise da criação e captura de valor considerando as diferenças e semelhanças entre as abordagens plataforma e territorial dos ecossistemas de inovação.

**Principais resultados:** As semelhanças e diferenças teóricas entre as abordagens territorial e plataforma devem ser consideradas na análise da criação e captura de valor dos ecossistemas de inovação. Assim,

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as estratégias de criação e a captura de valor devem ser elaboradas a partir de uma visão processual, de acordo com cada uma das etapas do ciclo de vida do ecossistema de inovação. Além disso, as estratégias de criação de valor devem ser alinhadas com as estratégias de captura de valor e os atores devem desenvolver mecanismos individuais e relacionais para criar e capturar o valor do ecossistema de inovação, que pode ser compreendido como um valor multidimensional (econômico, social, cultural ou ambiental).

**Contribuições teóricas/metodológicas:** O artigo apresenta uma estrutura conceitual e seis proposições teóricas para análise da criação e captura de valor em ecossistemas de inovação.

**Contribuições sociais/para a gestão:** O artigo contribui para que gestores empresariais, públicos, gestores universitários e de ONGs considerem tanto a criação quanto a captura de valor como drivers para atuarem em ecossistemas de inovação.

**Palavras-chave:** Inovação regional. Apropriação de valor. Coordenação do ecossistema de inovação.

### Resumen

**Objetivo del estudio:** El objetivo de este ensayo teórico es proponer un marco integrador para analizar la creación y captación de valor en ecosistemas de innovación.

**Metodología:** El presente es un ensayo teórico que se basa en una revisión narrativa de los conceptos de ecosistemas de innovación, creación de valor y captación de valor.

**Originalidad/relevancia:** El artículo contribuye de forma teórica al análisis de la creación y captación de valor al comparar y contrastar los enfoques territoriales y de plataforma en los ecosistemas de innovación.

**Resultados principales:** Al analizar la creación y captación de valor en los ecosistemas de innovación, se deben considerar las similitudes y diferencias teóricas entre los enfoques territoriales y de plataforma. Así pues, las estrategias de creación y captación de valor deben diseñarse de manera procedimental, de acuerdo con cada etapa del ciclo de vida del ecosistema de innovación. Además, las estrategias para crear y captar valor deben estar alineadas, y los actores deben desarrollar mecanismos individuales y colectivos para crear y captar el valor en el ecosistema de la innovación, el cual puede entenderse como un valor multidimensional (económico, social, cultural o ambiental).

**Aportaciones teóricas/metodológicas:** El artículo ofrece un marco conceptual, así como seis proposiciones teóricas para analizar la creación y la captación de valor en los ecosistemas de innovación.

**Aportaciones sociales/de gestión:** El artículo ayuda a los gestores de empresas, gobiernos, universidades y organizaciones no gubernamentales a considerar tanto la creación como la captación de valor como motores de la acción en los ecosistemas de innovación.

**Palabras clave:** Innovación regional. Apropiación de valor. Coordinación de ecosistemas de innovación.

### Introduction

Innovation ecosystems have gained great attention in the academic and management fields over the last two decades (Dias Sant'Ana, 2020; Gomes *et al.*, 2018). During this period, research in this area has advanced in two directions. The main approach (platform) examines innovation ecosystems (Adner, 2006; Adner & Kapoor, 2010) from the perspective of a hub company that interacts with other organizations to create and capture economic value (Pellikka & Ali-Vehmas, 2016). The second approach views the territory as a central element in innovation ecosystems (Scaringella & Radziwon, 2018; Piqué, Miralles & Berbegal-Miraben, 2019) and analyzes innovation ecosystems as a group of actors who create value in a geographical context, such as a city or region. In order to capture this value,

both approaches study organizations' collaborative actions in value creation activities that they could not achieve operating alone (Ritala & Tidström, 2014).

Value creation in these ecosystems is a complex issue, as an innovation ecosystem is an arrangement formed by different types of actors. Thus, the value created in an ecosystem can be multidimensional, as well as economic, social, cultural (Ben Letaifa, 2014), or environmental (Oskam, Bossink & De Man, 2021), and thus subjective (Chesbrough, Lettl & Ritter, 2018), assuming multiple dimensions, such as status, influence, social relationships or intrinsic satisfaction (Cabral *et al.*, 2019).

Value creation and capture have been analyzed through the perspective of inter-organizational networks (Ritala & Tidström, 2014), open innovation (Chesbrough *et al.* 2018; Dell' Era *et al.*, 2020), alliances (Lavie, 2007; Adegbesani & Higgins, 2010) and business and knowledge ecosystems (Clarysse *et al.*, 2014).

Moreover, value creation and capture have been studied in the innovation ecosystem literature primarily through the platform ecosystem approach (Schrieck, Wiesche & Krcmar, 2021) and from the perspective of companies and/or hub firms (Ritala *et al.*, 2013; Oh, Koh & Raghunathan, 2015), and to a lesser extent through how other actors influence the creation and capture of value in ecosystems (Khademi, 2020). Few studies in the territorial approach have assessed the creation and capture of value in cities or regions (Visnjic *et al.*, 2016; Radziwon, Bogers, & Bilberg, 2017).

Nonetheless, the literature on innovation ecosystems has primarily addressed the economic dimension while ignoring the social, environmental, and cultural dimensions of value. Despite this increased attention, the complexity of ecosystem structures and the ambiguity of understanding concepts such as value creation and capture in ecosystems have resulted in fragmented contributions from researchers (Khademi, 2020). In this regard, we found no studies in the literature on innovation ecosystems that highlights the similarities and differences of theoretical approaches to innovation ecosystems, as well as how these differences can interfere with the analysis of value creation and capture. Thus, a theoretical understanding of value creation and capture is required, taking into account the proximity and differences between the territorial and platform approaches.

The central argument of this theoretical essay is that differences in platform and territorial approaches result in different types of organizational objectives and different value perceptions among the actors in an innovation ecosystem (universities, companies, government and civil society). Thus, the goal of this theoretical essay is to propose an integrative framework for analyzing value creation and capture in innovation ecosystems that considers the differences between the territorial and platform approaches. To accomplish this objective, we developed a theoretical essay (e.g., Whetten, 1989; and Meneghetti, 2011) that was created from a narrative review of the concepts of innovation ecosystems and value creation and capture using searches in the Web of Science and SCOPUS databases on these two topics.

This article is justified by the urge for a theoretical understanding of the similarities and differences between territorial and platform approaches to innovation ecosystems in terms of value creation and capture. According to Bogers, Sims, and West (2019), future research should investigate how multilateral interdependencies among ecosystem members influence value creation and capture. When public actors and non-profit organizations are included in this network of organizations that create and capture value, this understanding becomes even more vital (Cabral *et al.*, 2019).

The contributions of this conceptual article can help future studies analyze the strategies and mechanisms by which actors create and capture value in innovation ecosystems, while taking into account the differences between the territorial and platform approaches. The advancement of this understanding can contribute to explain why actors such as universities, government agencies, and civil society participate in innovation ecosystems when they see value creation potential. However, these actors are frequently unable to identify mechanisms for capturing this value. As a result, future public policies can consider both value creation and value capture as drivers for motivating and engaging actors in innovation ecosystems.

This article is organized as follows: it begins with a discussion of the conceptual foundations of innovation ecosystems, as well as the creation and capture of value at the organizational and inter-organizational levels. Next, the essay proposes an integrative framework for analyzing value creation and capture in innovation ecosystems using the territorial and platform approaches, as well as six theoretical propositions. Finally, the study presents its final considerations.

## 2 Innovation ecosystems: platform and territorial approaches

Adner (2006) defined the concept of innovation ecosystem as "the collaborative arrangements through which firms combine their individual offerings into a coherent, customer-facing solution" (Adner, 2006, p. 2) following Moore's seminal publication on business ecosystems (Moore, 1993). Several authors then proposed definitions for this concept (Carayannis & Campbell, 2009; Adner & Kapoor, 2010; Gomes *et al.*, 2018; Granstrand & Holgersson, 2020). Regardless of the different theoretical perspectives, actors, relationships, cooperation, competition, co-evolution, and value creation elements pervade these definitions. Ecosystem management is another important aspect. Because there are no formal contracts, ecosystem leaders must persuade other actors to make contributions that are consistent with the ecosystem's value offering through orchestration (Autio, 2022).

The subsections that follow present two theoretical perspectives on innovation ecosystems: platform and territorial. The goal is to understand the similarities and differences between these approaches in terms of actors, relationship characteristics, value creation, ecosystem life cycle, and ecosystem management.

### 2.1 Innovation ecosystems: platform approach

An innovation ecosystem is defined in this approach as "a network of interconnected organizations, connected to a focal firm or a platform, that incorporates both production and use side participants, and creates and appropriates new value through innovation" (Autio & Thomas, 2014, p. 2). A platform is a mechanism for improving performance and generating new technologies for creating value in innovation ecosystems (Adner & Kapoor, 2010).

According to this viewpoint, a dominant company plans and proposes a platform, defined as a common service/product asset that actors can use to develop their offerings and achieve complementary innovations, in each innovation ecosystem. This market leader in the innovation ecosystem defines common goals, aligning participants' capabilities to drive innovation, value creation, and sharing among participants (Gawer, 2014; Gawer & Cusumano, 2014; Kwak *et al.*, 2017).

Value is defined as the economic gains resulting from company innovations in products/services offered to the market. On the one hand, there is value creation based on collaborative relationships between companies at each stage of the ecosystem's life cycle (Moore, 1993). On the other, the gains from the products/services must be captured by these actors through competition relations for market shares superior to competitors or through market penetration in new markets.

In terms of actors, this approach's research focuses primarily on the perspective of the hub company/ecosystem leader (Nambisan & Baron, 2013), with less emphasis being placed on the role of actors such as universities, government, and non-profit organizations (Borges *et al.*, 2019). According to Gomes *et al.* (2021), ecosystem research should conduct additional studies on the perspectives of non-focal or non-leading actors. Interdependent relationships (Jacobides, Cennamo & Gawer, 2018) between the hub firm and suppliers, customers, universities, and government are considered when constructing an innovation ecosystem with the goal of providing products/services to customers.

An innovation ecosystem is defined as an interdependent community of heterogeneous participants (Thomas & Autio, 2020; Gomes *et al.*, 2021), which requires some form of governance, whether decentralized or centralized (Bogers *et al.*, 2019). Orchestrating this network of partners is critical to achieving innovation goals (Yaghmaie & Vanhaverbeke, 2019), but it is a challenge due to the lack of formal contracts (Autio, 2022). Therefore, each stage of the ecosystem's lifecycle requires a different strategy and activity orchestration (Autio, 2022).

Concerning the limits, the platform approach has not included discussions about the ecosystem's territorial delimitation. Actors, on the other hand, are constrained by their complementarity (Gomes *et al.*, 2021), which can occur with local organizations or with organizations from other regions and countries.

## 2.2 Innovation ecosystems: territorial approach

Economic geography emphasizes the spatial dimension of ecosystems, which are defined as institutional, geographic, economic, or industrial contexts that can be analyzed at various levels, such as industries, universities, regions, and nations (Feldman, Siegel & Wright, 2019). Ecosystems are defined by their territorial boundaries and geographical proximity, rather than by a platform or technology (Jackson, 2011).

Territorial approach studies predate the concept of innovation ecosystems (see Lundvall, 1992; Nelson, 1993; Asheim & Gertler, 2005). Scaringella and Radziwon (2018) identify the presence of common elements in a given territory, such as a distinct atmosphere and shared values (trust, belonging to a community, mutual understanding built over time through shared culture and routine), in addition to a solid base economy with agglomeration economies and localized spillovers. In the social realm, the coexistence of collaboration and competition, of social and human capital, of knowledge and its transfer through intensive learning are factors that can result in outcomes such as innovation/entrepreneurship and economic growth and development (Scaringella & Radziwon, 2018).

This territory includes various ecosystem actors such as companies, research institutes, universities, civil society organizations, and legislators (Scaringella & Radziwon, 2018; Santos, Zen & Bittencourt, 2021). When these actors propose innovations in a geographic context, they create value for reasons other than those examined by the platform approach. Community, brand, social commitment, social responsibility, economic development, and innovation are organizational outcomes that some actors can leverage by being co-creators in regional ecosystems. Thus, value has economic, social, environmental, and cultural components (Ben Letaifa, 2014; Oskam *et al.*, 2021).

Therefore, each actor is motivated to create value (Cunningham, Menter & O'Kane, 2017). The main motivation for the university is reputation; for the government, public goods; for industry, profit; and for civil society, prices (Cunningham *et al.*, 2017). Regardless of these differences, a balance of interests of the actors involved is required to create collaborations that encourage the various parties to develop together (Valkokari *et al.*, 2017).

The territorial approach allows for the analysis of innovation ecosystems at different levels, such as an urban district (Piqué *et al.*, 2019), a city (Visnjic *et al.*, 2016), or a region (Markkula & Kune, 2015). The regional innovation ecosystem is one of the key concepts, and it consists of multiple technological innovation organizations and multiple technological innovation environments in a region (Huang, 2003), including universities, government, businesses, and civil society. Orchestrators facilitate activities and play critical roles in unlocking the full potential of innovation in the region's ecosystem. The regional ecosystem's active orchestration revolves around concepts such as knowledge co-creation and exploitation, opportunity exploration, and empowerment (Markkula & Kune, 2015).

Another critical component is the understanding of the life cycle concept, which is associated with the ecosystem. An urban district's innovation areas evolve in four stages: initiation, launch, growth,

and maturity (Piqué *et al.*, 2019), and different strategies are more effective at engaging and mobilizing actors for joint development actions at each stage of developing an innovation ecosystem (Santos, Zen & Bittencourt, 2021).

Thus, research on innovation ecosystems has advanced in platform and territorial approaches, revealing both similarities (interdependence between actors, collaboration and competition relationships, and the joint co-evolution of actors and the ecosystem at various stages of development) and differences: The platform approach emphasizes the development of products and services with a focus on value creation between companies; and territorial ecosystems, with the goal of developing innovations aimed at the economic, social, environmental, and cultural development of a geographically defined area.

**Table 1**

*Main differences and similarities between innovation ecosystems approaches*

Elements	Platform approach	Territorial approach
Definition	Collaborative arrangements through which companies combine their individual offerings into a coherent customer-facing solution (Adner, 2006).	Ecosystems can be analyzed at different levels of aggregation, such as companies, industries, universities, regions and nations. (Feldman <i>et al.</i> , 2019)
Limits	Actors are limited by their complementarity (Gomes <i>et al.</i> , 2021) and not by their geographic limits.	It emphasizes the spatial dimension of ecosystems (Feldman <i>et al.</i> , 2019) with geographic proximity to their entities (Jackson, 2011; Scaringella & Radzivon, 2018), delimited by an urban district (Piqué <i>et al.</i> , 2019), a city or a region (Markkula & Kune, 2015).
Actors	Emphasis on companies and a hub firm (Adner, 2006; Adner & Kapoor, 2010; Nambisan & Baron, 2013)	Emphasis on the heterogeneity of actors such as universities, companies, government and civil society (Piqué, <i>et al.</i> , 2019; Zen <i>et al.</i> , 2021)
Characteristics of Relationships	Relationships of interdependence, collaboration and competition (Moore, 1993; Adner, 2006)	Relationships of interdependence, collaboration and competition (Scaringella & Radzivon, 2018)
Value Dimensions	Economic (Adner & Kapoor, 2010)	Economic, social, cultural. (Ben Letaifa, 2014; Scaringella & Radzivon, 2018)
Life cycle	Birth, expansion, leadership and author renewal or death (Moore, 1993).	Beginning, launch, growth and maturity (Piqué <i>et al.</i> , 2019; Santos <i>et al.</i> , 2021)

**Source:** From authors' authority.

In this way, the definition, limits, diversity, and heterogeneity of actors, as well as the final goal, differ between the platform and territorial approaches, making the perception of value and the relationships between the actors more complex and diffuse. Consequently, the value creation and capture analyses of these approaches cannot be understood in the same way.

### 3 Value creation and capture at organizational and inter-organizational levels

The creation and capture of value have been the subject of research at the organizational and inter-organizational levels (networks, alliances, open innovation and ecosystems). These contributions lay the groundwork for the identification of five theoretical dimensions of value creation and capture: procedural approach, value creation and capture strategies, value creation mechanisms, value capture mechanisms, and multidimensional value.

**Procedural Approach.** Value creation and appropriation objectives should be viewed as dynamic phenomena that change over time during the relationship (Ritala & Tidström, 2014). Chesbrough and Appleyard (2007) present the "open strategy," which aims to strike a balance between value capture and value creation rather than losing sight of value capture in the pursuit of innovation. The value varies according to the stage of the ecosystem (Khademi, 2020).

The stages of ecosystem development have been used to analyze value creation and capture (Ben Letaifa, 2014; Ritala *et al.*, 2013). In the early stages, there is a high value placed on co-creation and a low value placed on capture (Ben Letaifa, 2014). There is high value co-creation and capture during the development or expansion stage (Ben Letaifa, 2014). Then, there is low value creation and high value capture during the maturity stage (or its inability to create more value). When value capture goes beyond value creation, the ecosystem must focus on value co-creation or renew itself. Low value creation and capture occur during the renewal or death stage. At this point, there is little value capturing. To dismantle their network, members must work together. If this happens, they can either restart their innovation process or collaborate to regenerate their ecosystem (Ben Letaifa, 2014). Thus, at each stage, organizations must implement collaboration and competition strategies that adhere to the aforementioned value creation and capture characteristics. According to Seo *et al.* (2015), the informal strategy (secrecy and lead time) is effective during the invention stage. The combination of formal (patents) and informal strategies results in increased productivity during the commercialization phase.

**Value Creation and Capture Strategies:** Individual performance and the capture of the value of a company's innovation are becoming increasingly dependent on the ability to manage assets and resources outside of its direct control; thus, the strategic perspective of innovation ecosystems, such as co-creation, networking, and interaction with innovation ecosystem partners, play a critical role (Pellikka & Ali-Vehmas, 2016). This requires leaders to develop a strategy that considers: continuous orchestration, continuous encouragement from complementary agents and suppliers, continuous business model review, and continuous ecosystem performance (Khademi, 2020). This procedural characteristic of value creation and capture is an important factor to consider. Thus, value creation and capture must be strategically aligned, and once achieved, both value creation and capture must be maintained and monitored to ensure that such alignment is kept (Sjödín *et al.*, 2020).

**Value Creation Mechanisms.** When writing about competitive advantage, Porter (1985) states that new value is created when companies develop new ways of performing tasks, new methods or



technologies. Sjödin *et al.* (2020, p. 161) define value creation as "sets of activities that enable providers and customers to progressively realize this higher value." Thus, value creation is the result of various types of activities, such as input acquisition and product and service creation. Value creation was defined by Ritala *et al.* (2013, p. 5) as "the collaborative processes and activities that create value for customers and other stakeholders." This product is the result of R&D activities, company maintenance, and value realization activities such as marketing and customer relationships (Bowman & Ambrosini, 2007). Therefore, value is created when the willingness of a buyer to pay for a product or service exceeds the opportunity cost (Brandenburger & Stuart, 1996).

Companies in networks use the network to identify value creation synergies (Ritala & Tidström, 2014). Value creation requires relationship-specific assets, knowledge sharing routines, and the establishment of effective governance mechanisms (Dyer, Singh & Hesterly, 2018). Organizations must use the network's cooperative relationship to create individual value for the company by combining company and network resources to create value for themselves (Ritala & Tidström, 2014).

Value creation mechanisms in alliances increase the focal company's ability to generate value from its relationships with partners by pursuing shared goals and diversifying activities that contribute to the overall value of the alliance (Lavie, 2007) or multiple concurrent alliances (Wassmer & Dussauge, 2011).

The emphasis in open innovation processes is on the interactions of companies with various external actors (creative individuals, innovation communities, universities, customers, suppliers, competitors, and companies from other industries) to create value (Dell Era *et al.*, 2020). Value creation can occur in open innovation by providing resources to an external organizational partner who values or uses this resource in its processes (Chesbrough *et al.*, 2018).

**Value Capture Mechanisms.** The process of capturing value can be defined as either the negotiation/bargaining between the company and the buyer, which determines the price of this value (Brandenburger & Stuart, 1996) or as the process of ensuring profits from value creation and distributing these profits among the participants, like suppliers and partners (Sjödin *et al.*, 2020). Value capture was defined by Ritala *et al.* (2013, p. 248) as "the individual firm level actualized profit-taking; that is, how firms eventually pursue to reach their own competitive advantages and to reap related profits." Value capture is influenced by competition, as an increase in supply can reduce the exchange value (Lepak *et al.*, 2007). To increase value capture, organizations can implement isolation mechanisms, which are physical or legal knowledge barriers that prevent a competitor from replicating a product or service (Lepak *et al.*, 2007). The value created by one level of analysis (individual and/or organizational) can be captured by another (social). This is referred to as process value slippage by Lepak *et al.* (2007).

Patents, secrecy, lead time advantages, and investments in complementary assets are the primary value capture mechanisms (James *et al.*, 2013). Companies maximize value capture in their relational strategy by leveraging joint capabilities for value appropriation in line with the network's common

benefits (Ritala & Tidström, 2014). Capabilities to capture value are linked to contract elaboration, governance, and negotiation during alliance formation. Capabilities to capture value are also linked to intra-firm routines for learning and knowledge transferring, absorption capacity, monitoring, and governance in the post-training stage (Wang & Rajagopalan, 2015).

Internal assets (physical, traditional reputational, organizational, financial, intellectual, and technological) and business models must be designed to capture value in open innovation processes (Dell Era *et al.*, 2020). The value capture process entails appropriating a portion of the value created and is defined as the process of negotiating access to and/or ownership of resources in exchange for providing value to a partner (Chesbrough *et al.* 2018).

Furthermore, value capture mechanisms differ depending on determinants such as actor role, stage of value creation and capture, type of interaction between actors, mutuality of intentions, and the actor's position in the ecosystem structure (Khademi, 2020). Value has multiple dimensions, including social, cultural, environmental, and economic. As a result, according to Ben Letaifa (2014, p. 282), it is "myopic to evaluate the value of such socioeconomic keystones exclusively by assessing their annual balance sheets." Thus, community, brand, social commitment, social responsibility, and economic development are organizational outcomes that some socioeconomic actors can leverage by being ecosystem co-creators (Ben Letaifa, 2014).

**Multidimensional Value.** Value, because it lacks a concrete definition, can be understood as a subjective concept with various representations depending on individual or organizational interests and perceptions (Schneider & Sachs, 2017). Thus, the definition of value varies depending on the type of organization and can be perceived as ecosystem or multi-actor (Ben Letaifa, 2014).

The literature on value creation and capture has focused on the economic value created by businesses and has used value concepts that are aligned with customer perceptions. This essay, on the other hand, sheds light on the perceived value by universities, government, civil society and companies. These ecosystem actors all have different objectives. Thus, value must be understood as multidimensional (Lepak, Smith, & Taylor, 2007), with economic, social, cultural, and environmental dimensions. (Ben Letaifa, 2014; Oskam *et al.*, 2021).

Therefore, the literature presents the following theoretical dimensions: procedural approach to value creation and capture, value creation and capture strategies, individual and collective value creation mechanisms, individual and collective value capture mechanisms, and multidimensional value. These dimensions are summarized in Table 2. procedural view of value creation and capture

**Table 2**

*Contributions from the Value Creation and Capture Literature*

Dimensions	Concept	Conceptual Basis
Procedural Approach	<ul style="list-style-type: none"> <li>• Planning strategies for creating and capturing value throughout the stages of an innovation ecosystem's life cycle.</li> </ul>	Ben Letaifa (2014) Ritala and Tidström (2014)
Value creation and capture Strategies	<ul style="list-style-type: none"> <li>• Aligning value creation strategies with value capture strategies.</li> <li>• Developing individual and collective value creation and capture strategies.</li> </ul>	Chesbrough and Appleyard (2007), Sjödin <i>et al.</i> (2020) Pellikka and Ali-Vehmas (2016).
Individual and collective value creation mechanisms	<ul style="list-style-type: none"> <li>• Each actor has a motivation to create value: reputation, public goods, profit, price.</li> <li>• Establishing collaborative value creation processes and activities that enable providers and customers to achieve a higher value.</li> <li>• Value creation mechanisms are tangible (they connect actors) and intangible (clear communication, trust and common vision among actors).</li> <li>• The value creation mechanisms can be the creation of products and services, the research and development activities and the company's maintenance activities.</li> </ul>	Ritala <i>et al.</i> (2013), Sjödin <i>et al.</i> (2020), Bowman e Ambrosini (2007), Cunningham <i>et al.</i> (2017).
Individual and collective value capture mechanisms	<ul style="list-style-type: none"> <li>• Patents, industrial secrecy, lead time, complementary assets and bargaining are value capture mechanisms.</li> <li>• Revenue distribution among ecosystem members is a value capture mechanism.</li> <li>• Reputational, organizational, intellectual, human and technological assets are value capture mechanisms.</li> <li>• The motivation of each actor, guaranteeing the understanding of the objectives and business needs of the different actors are value capture mechanisms.</li> </ul>	James <i>et al.</i> (2013), Brandenburger and Stuart (1996), Lepak <i>et al.</i> (2007), Pellikka and Ali-Vehmas (2016), Ritala <i>et al.</i> (2013), Khademi (2020), Ben Letaifa (2014), Dell Era <i>et al.</i> (2021)
Multidimensional value	<ul style="list-style-type: none"> <li>• The value created and captured is multidimensional: economic, social, environmental and cultural.</li> </ul>	Ben Letaifa (2014), Lepak <i>et al.</i> (2007), Oskam <i>et al.</i> (2021)

**Source:** From authors' authority.

In summary, the publications emphasize the dimension of economic value and the importance of inter-actor relationships in value creation. Value capture, on the other hand, is primarily dependent on individual strategies and negotiation skills to capture a portion of the value created. As a result, the complexity of the relationship between value creation and capture grows as it becomes necessary to collaborate to create value and compete to capture a portion of this collectively created value. Based on the contributions of these authors, it is possible to advance in the theoretical understanding of the creation and capture of value in innovation ecosystems.

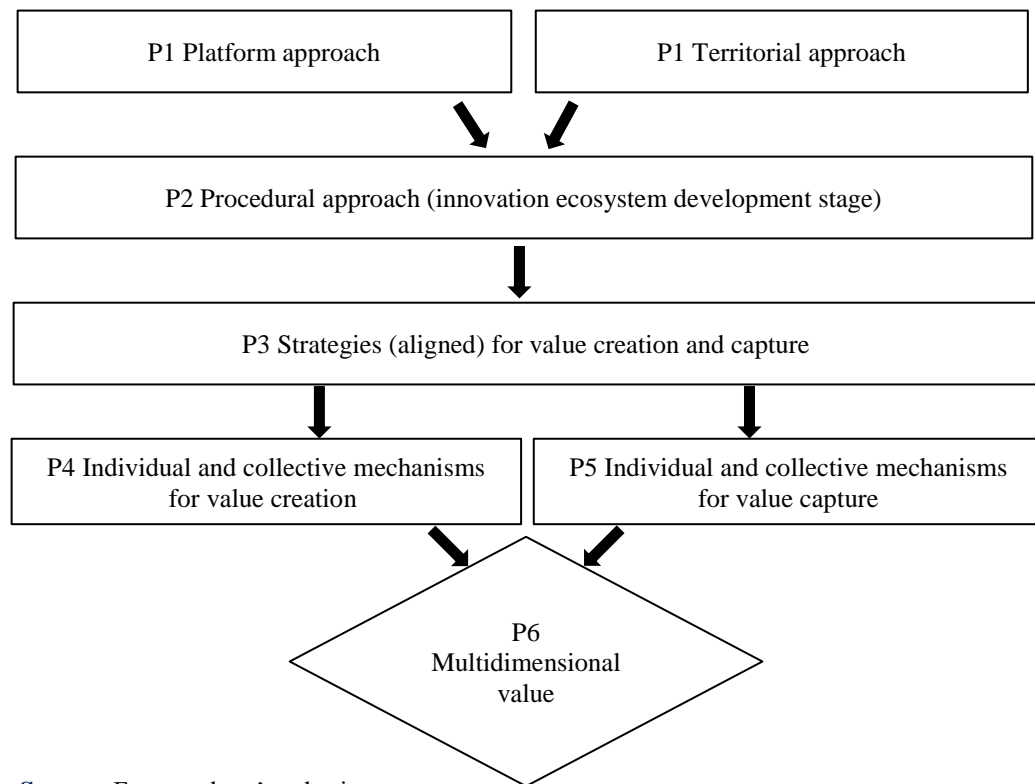
#### 4 Integrative framework for the creation and capture of value in innovation ecosystems

We propose an integrative framework to analyze the creation and capture of value in innovation ecosystems based on the theoretical discussion presented (Figure 1). The integrative framework is

described first, followed by the six theoretical propositions. The framework is divided into six dimensions: theoretical approach (platform or territorial), procedural approach of value creation and capture, value creation and capture strategies, value creation mechanisms, value capture mechanisms, and multidimensional value. The arrows represent the interdependence between these dimensions. Initially, we argue that the first step in the analysis of value creation and capture in innovation ecosystems is a positioning/decision by researchers about which theoretical approach (platform or territorial) will be used.

**Figure 1**

*Integrative Framework for Value Creation and Capture in Innovation Ecosystems*



**Source:** From authors' authority.

Next, it is recommended to take a procedural approach to value creation and capture, as these are processes that must be analyzed throughout the various stages of the innovation ecosystem's development. The next step is to create and capture value through individual and collective mechanisms. These mechanisms must be established based on the type of value perceived by each actor, which can be multidimensional (economic, social, cultural, or environmental) and varies based on the organizational objectives of each actor in the innovation ecosystem. We developed six theoretical propositions for the analysis of value creation and capture in innovation ecosystems based on the literature presented in this article.

The study's central argument is that different types of organizational objectives result in different mechanisms and strategies for value creation and capture. As a result of these differences in objectives, different perceptions of value emerge among universities, companies, governments, and civil society. Thus, both the territorial approach and the platform can use the integrative framework as long as the following differences between the approaches are observed. Initially, these are approaches with different theoretical foundations. The territorial approach emphasizes innovations in a geographically limited context (Scaringella & Radzivon, 2018; Feldman *et al.*, 2019), whereas the delimitation in the platform approach is determined by the complementarity of actors (Gomes *et al.*, 2021). The platform approach emphasizes companies and hub firms (Adner, 2006; Adner & Kapoor, 2010), whereas the territorial perspective addresses the heterogeneity of actors (Piqué *et al.*, 2019; Zen *et al.*, 2021). These distinctions result in different types of organizational objectives and value perceptions to be created and captured in innovation ecosystems. In this sense, we propose that researchers take a theoretical stance in relation to both approaches. Proposition 1 is derived from this literature review:

P.1: *“The platform approach or the territorial approach can be used to analyze the creation and capture of value in innovation ecosystems.”*

The stages of ecosystem development interfere in value creation and capture strategies in innovation ecosystems for both the platform and territorial approach. Just as the literature on innovation ecosystems has identified that different strategies are more effective in engaging and mobilizing actors in the development of the different stages of an innovation ecosystem through the platform (Autio, 2022) and territory (Piqué *et al.*, 2019; Santos *et al.*, 2021), value creation and capture strategies must also consider these stages of development. Therefore, as the ecosystem evolves, the creation and capture strategies must be developed/readapted so that the organization can participate in value creation at the appropriate time and devise appropriate value capture strategies for each stage of development of ecosystems (Ben Letaifa, 2014). With this, it is necessary to adopt a procedural approach to analyze value creation and capture strategies. As a result, proposition 2 is derived from the literature:

P.2: *“The value creation and capture strategies are procedural in nature and are dependent on the stage of development of the innovation ecosystem.”*

Keeping these two strategies aligned and making efforts to maintain this alignment is just as important as adopting strategies for value creation and capture (Sjödin *et al.*, 2020). Contributing to value creation does not automatically imply capturing value, as they are distinct but interdependent processes (Oskam *et al.*, 2021). The creation and capture of value in the innovation ecosystem must be planned at both the creation and management stages (Ritala *et al.*, 2013). The success of the innovation ecosystem is determined by value capture, which is influenced by knowledge flows related to value creation (Radziwon *et al.*, 2017). Thus, a balance between value creation strategies is recommended,

particularly when companies collaborate in the co-creation of value and are unable to adopt value capture strategies during the search for innovation, because sustaining a business model requires capturing a portion of the value created by innovation (Chesbrough & Appleyard, 2007). As a result of this analysis, proposition 3 is developed:

P.3: *“Each actor in the innovation ecosystem must coordinate their value creation and capture strategies.”*

Based on their value creation and capture strategies, each actor must establish collective value creation mechanisms: collaborative value creation activities for customers and other stakeholders that enable end users to perceive higher value in this product/service (Adner & Kapoor, 2010; Sjödin *et al.*, 2020). Companies, universities, governments, and civil society all have different reasons for creating value, such as reputation, profit, public goods, and price (Cunningham *et al.*, 2017).

Companies use the network to identify value creation synergies (Ritala & Tidström, 2014), and the specific assets of relationships, such as knowledge sharing routines, are critical for value creation (Dyer *et al.*, 2018). Thus, value creation should be a goal of the relational strategy, with the co-competitive relationship serving as a source of mutual value creation by combining network resources and capabilities to create common benefits for the entire network. Similarly, they should leverage the network's cooperative relationship to generate individual value for the company by combining company and network resources to generate value for themselves (Ritala & Tidström, 2014). These mechanisms can be both tangible and intangible, such as clear communication, attracting actors, and building trust and a shared vision among actors (Ritala *et al.*, 2013).

Individually, this value is created through investment in research and development activities, as well as activities related to product and service creation, in addition to company maintenance operations (Porter, 1985; Bowman & Ambrosini, 2007). As a result of this research, proposition 4 is developed:

P.4: *“Each actor in an innovation ecosystem must develop individual and collective value creation mechanisms based on value creation and capture strategies.”*

Each actor must establish individual and collective value capture mechanisms based on value creation and capture strategies. Patents, industrial secrets, lead time advantages, and investments in complementary assets are examples of individual value capture mechanisms commonly used by businesses (James *et al.*, 2020). Thus, while some value capture mechanisms are individual, capturing the value of a company's innovation is also dependent on collective aspects, such as the ability to manage assets and resources that are not directly under its control (Pellikka & Ali-Vehmas, 2016). Internal reputational, organizational, intellectual, human, and technological assets can also capture value (Dell Era *et al.*, 2021), as can revenue distribution among ecosystem members (Khademi, 2020). Therefore, from this literature, proposition 5 is elaborated:

P.5: “Each actor in an innovation ecosystem must develop individual and collective value capture mechanisms based on value creation and capture strategies.”

Value is also an important concept to grasp when attempting to comprehend the creation and capture of value in innovation ecosystems. Contributions on the creation and capture of value frequently present the economic dimension of value (Brandenburger & Stuart, 1996; Sjödin *et al.*, 2020), primarily because they analyze value from the company's perspective. However, in a territorially analyzed innovation ecosystem, the heterogeneity of actors (Piqué *et al.*, 2019; Santos *et al.*, 2021) generates multiple interests and objectives (Cunningham *et al.*, 2017). Thus, value is understood to be multidimensional in this context (Lepak *et al.*, 2007), as it can be economic, social, environmental, and cultural for each of the various organizations that comprise an innovation ecosystem (Scaringella & Radzivon, 2018; Oskam *et al.*, 2021). As a result of this research, proposition 6 is created:

P.6: “The value created and captured in the innovation ecosystem is multidimensional and can be economic, social, environmental, or cultural in nature.”

Therefore, it is understood that the actors in an innovation ecosystem must have value creation and capture strategies that are aligned with and in accordance with each stage of the innovation ecosystem's development. The concept of value creation and capture strategy differs from the concept of value creation and capture mechanism in this context. Strategies are each actor's intentions and plans for creating and capturing value. And the value creation and capture mechanisms are the value creation and capture practices/activities, or how each actor created and captured (benefited) by participating in innovation ecosystem projects.

In this sense, when participating in an innovation ecosystem, actors (primarily universities, government agencies, and civil society) must be clear about their individual goals. Furthermore, they must develop strategies and mechanisms to capture these values and benefits as they participate in each stage of development of the innovation ecosystem. Similarly, actors must understand how they can contribute to the establishment of common collective goals established by the innovation ecosystem, as well as develop mechanisms to aid in the creation and co-creation of these benefits for the innovation ecosystem.

## 5 Final considerations

The objective of this essay is to propose an integrative framework for analyzing value creation and capture in innovation ecosystems that considers the differences between territorial and platform approaches. Three theoretical contributions were presented in this article. Initially, the platform and territorial approaches were presented in relation to theoretical elements such as definition, actors, relationship nature, created value, limits, and ecosystem life cycle. Second, five theoretical dimensions

of value creation and capture were identified: multidimensional value, value creation mechanisms, value capture mechanisms, procedural approach, and value creation and capture strategies. The third and most important contribution was the six theoretical propositions and conceptual model for analyzing the creation and capture of value in innovation ecosystems, as well as the possibility of applying the framework for analyzing innovation ecosystems using both the territorial and the platform approach.

We argue that the differences between platform and territorial approaches (the heterogeneity of actors, differences in organizational objectives, and different perceptions of value) are elements that require attention in studies on the creation and capture of value in innovation ecosystems. In this sense, we highlight the theoretical foundations of each approach so that future research can progress in relation to ecosystems as a platform as well as territorially delimited ecosystems.

This essay also presented empirical contributions. Although the creation and capture of value in businesses has been well documented in the literature, university, government, and civil society managers require management tools on this subject as well. Second, it contributes to the development of public policies that consider value creation and capture as drivers to motivate and engage actors in innovation ecosystems. Because by identifying the mechanisms for generating and capturing these diverse actors, public policies can be tailored to the needs of each actor and, as a result, to the innovation ecosystem itself.

However, there are some limitations to the article. Since this is a theoretical study, additional research based on the propositions presented here is required. Future empirical studies may shed new light on value creation and capture in innovation ecosystems. One suggestion is to conduct empirical research at different territorial levels (such as cities or regions) or on different business sector platforms to identify similarities and differences in these actors' mechanisms and strategies for value creation and capture in relation to each of these methods.

Because it is associated with the collaborative activity of the actors in the proposal of a new product/service, value creation has received more attention in innovation ecosystems. The end consumer looks for a product and/or service, and value is created for the consumer, according to the platform. The final goal of the territorial approach is society, as innovations seek to develop the geographically delimited territory. When analyzed within a city or region, many actors in an innovation ecosystem do not have deliberate competitive strategies (mainly to non-profit organizations, public universities, public agencies). However, in order to capture multidimensional value from their collaborations in innovation ecosystems, these actors must plan and execute strategies as well as establish mechanisms. As a result, actors in innovation ecosystems (as defined by the territorial approach) must consider whether a large number of ideas have a positive impact on the innovation of their organizations, as well as whether and how this value is captured.

The argument advanced in this essay emphasizes the importance of understanding the interdependent relationships between actors' strategies for value creation and capture and their



mechanisms for creating and capturing value in an innovation ecosystem. As a result of better clarifying the dynamics of value creation and capture in innovation ecosystems, it is expected to contribute to regional economic, social, and cultural development, as innovation ecosystems have been identified as a relevant force to generate regional development.

### Authors' contributions

Contribution	Santos, C. A. F. dos	Zen, A. C.
Contextualization	X	X
Methodology	X	X
Software	X	
Validation	X	X
Formal analysis	X	X
Investigation	X	
Resources	X	X
Data curation	X	X
Original	X	
Revision and editing	X	X
Viewing	X	X
Supervision		X
Project management	X	X
Obtaining funding		X

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