

Reflections on The Essence of The Concept of "Ecosystem"

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Abstract: This article discusses the concept of "ecosystem," widely used in business and strategic management, focusing on its well-known definitions in the literature, as well as the relationships between the concepts of "system," "value chain," and "supply chain." To identify the relationship between these concepts, a graphical visualization is proposed, demonstrating the distinctive feature (characteristic property) of ecosystem from other organizational forms of business and other constructs. The connection between the concepts of "system" and "ecosystem" is also established, confirming the rationale for introducing this term for this concept.

Keywords: ecosystem, system, supply chain, value chain, characteristic property of ecosystem.

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I. Introduction

The Internet era is no more than 45 years old. According to Bill Gates, it began in 1981, with the release of the first IBM PC. The rapid development of the Internet during this period and the use of *digital information technologies*¹ (IT) have transformed the very nature of business and its conduct, providing unlimited potential opportunities in virtually every field. This has also led to the emergence of new *organizational and economic forms* (OEFs) of business. Among these, the most rapidly developing is the ecosystem form, which offers new opportunities and advantages over traditional methods of doing business within the framework of old business models. It is worth noting that Ron Adner (2017) adhered to the view of the ecosystem as an organizational structure, while Michael Jacobides et al. (2018) considered the ecosystem as a separate form of entrepreneurial organization. In general, the transition to an ecosystem should be perceived as an objective *stage in the evolution of organizational structures*.

As is well known, the concept of "ecosystem" in economics was first introduced by James F. Moore in his book *"The Death of Competition"* (1996). In it, he argued that it is precisely this innovation that will enable a company to achieve significant financial results if it creates new products (goods, services, and technologies) more efficiently than other companies in the same industry (Moore, 1996). Moore also believed that it is important to study the life cycle of an ecosystem (according to Moore, *the stages of co-evolution*). He identified *four stages: birth, leadership, expansion, and self-renewal*, each of which involves a number of necessary actions in a competitive environment. The first stage is characterized by actions to form the structure of the business ecosystem and organize its functioning. In the second, it is important to protect it and its value proposition from competitors. At the same time, Moore spoke of the end of the era of competition between individual firms and the beginning of competition between business ecosystems (Moore, 1996). The third phase noted the emergence of clear winners and losers. *The winners* are those who will lead the ecosystem and who have achieved success due to a combination of three factors: the first is the *continuous improvement of innovations* (creating and pursuing an "innovation trajectory"), the second is *their exceptional importance*, and the third is *integration* - the establishment of close ties between firms within the ecosystem (Moore, 1996). And it is integration that underlies the success of the fourth stage-*self-renewal*.

Since then, the understanding of the concept of "ecosystem" and its study across a wide range of topics have received close attention from specialists in this field. Thus, from 2000 to 2017 alone, the number of articles mentioning the term "ecosystem" exceeded 80,000 (Kapoor, 2018). And Fuller, Jacobides, & Reeves (2019) noted that the term appears 13 times more often in companies' annual reports than a decade ago.

A review of *empirical studies* on various aspects of ecosystem functioning shows that they have been devoted primarily to the analysis of specific situations and solutions to a number of specific problems in this area (for specific companies, industries, and countries). For example, Adner and Kapoor (2010) studied value creation in innovation systems using the example of the production of equipment for *semiconductor*

¹Digital technologies include artificial intelligence, big data processing, the Internet of Things (IoT), cloud computing, distributed ledgers (blockchain), etc.

lithography(1962-2005). Later, Adner (2017) substantiated the need to use the ecosystem format using the example of *innovations in the tire industry* (for Michelin tires), and Hannah & Eisenhardt (2018) illustrated the importance of applying a "bottleneck" strategy to achieve a balance between competition and cooperation by analyzing the successes and failures of five firms in the US *residential solar industry* (for the period 2007-2014).

It should be emphasized that empirical studies are *sporadic*. At the same time, the topics of *theoretical research* are quite broad. Thus,

- Adner (2017), Schmidt & Foss (2023), and others studied the *ecosystem as a structure*;
- Adner (2006), as well as Ganco & Lee (2018), and others studied the *innovativeness of ecosystem subjects*;

- *Platform ecosystems* were studied by Gawer & Cusumano (2002), Ceccagnoli et al. (2012), McIntyre & Srinivasan (2016), Helfat & Raubitschek (2018);

- *Various strategies in ecosystems* were considered by Adner (2006), Ozcan & Eisenhardt (2009), Adner & Kapoor (2010), Rietveld et al. (2017), Hannah (2018);

- *the problem of cooperation in value creation* within an ecosystem and competition in the distribution of added value has been addressed by Gawer & Henderson (2007), Ceccagnoli et al. (2012), Ritala et al. (2013), Kapoor & Lee (2012) and Stonig et al. (2022);

- *the balance between competition and cooperation in ecosystems* has been studied by Kapoor & Lee (2012), Gnyawali & Ryan Charleton (2018), Hannah & Eisenhardt (2018), and Hoffmann et al. (2018).

However, despite the large number of theoretical publications on a wide variety of important topics related to ecosystems, there is still no *generally accepted definition* of the concept of "ecosystem". Various definitions have been proposed by different authors, each time in the context of specific areas of their research. However, the focus of theoretical research, like empirical research, is not systematic, since the systematic construction of any theory presupposes the development of a generally accepted definition of the object of study based on the identification of its *characteristic property* that distinguishes it from all other objects in the corresponding universum of the OEF.

Currently, the general concept of an ecosystem boils down to the following: an *ecosystem* is a dynamic and evolving network of companies *that jointly create a value proposition that they could not realize individually*. However, this concept is based on the *network concept and does not include a statement of the ecosystem's characteristic property*, and therefore is unlikely to satisfy the requirements for defining concepts in any theory constructed according to scientific principles. This study attempts to fill this gap and bring our comprehension closer to a more precise understanding of the essence of the concept of "*ecosystem*."

II. Historical and Semantic Aspect

To understand the semantic meaning of the concept "*ecosystem*," let's examine its construction. "Ecosystem" is a term composed of the words "*eco*" and "*system*." The former originates in ecology and *reflects the relationship of living beings to their environment*. The latter comes from the Greek word "systema," which is understood as a whole composed of parts (Filimonov et al., 2021).

Business borrowed the concept of an ecosystem *from biology*, where it was first introduced in 1935 by the British botanist and ecologist **Arthur Tansley**, who was then teaching at Oxford University (Tansley, 1935). He coined the term "ecosystem" and introduced the concept of an ecosystem. According to Tansley, an **ecosystem** is a local community of organisms *that interact with each other and the environment*. To thrive, these organisms *simultaneously compete and cooperate, coevolve, and adapt within the system to environmental changes* (Tansley, 1935). In biology, **an ecosystem** is a single, open, functional *biosystem* consisting of a collection of *living organisms and their environment*, as well as a network of connections through which matter and/or energy are exchanged between them (Von Bertalanffy, 1969). Thus, from the very beginning of conceptualizing the concept of "ecosystem," the connection between its participants and the external environment has been emphasized.

The term "ecosystem" was introduced into social science by sociologist **Amos Hawley**. He defined **an ecosystem** as "a system of interdependencies within a population through which *the whole functions as a unit* and thereby maintains viable ecological relationships" (Hawley, 1986, p. 26).

III. Development of Concepts of Ecosystem in the Economy

The prerequisites for the creation of ecosystems in the economy include, first and foremost, (1) *the development of technologies* that enable companies to effectively interact with customers and partners (e.g., comprehensive business digitalization (digital platforms), Big Data analytics, APIs, etc.); (2) *the entry of innovative companies into the market*, providing more advanced customer-oriented products/services/technology; and (3) *the need for customers to quickly receive a variety of high-quality*

products and services with minimal effort through convenient digital channels (Filimonov and Kasyanenko, 2022).

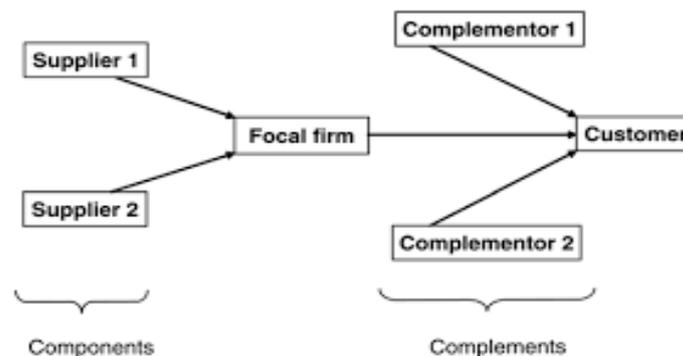
Thus, in June 1993, business strategist James F. Moore published an article in the Harvard Business Review entitled "*Predators and Prey: A New Ecology of Competition.*" He proposed viewing business as an ecosystem in which producers and buyers *co-evolve*, complementing each other, and thereby *developing*. In this concept, a company was viewed not as an individual player, but as a representative of a business ecosystem encompassing *multiple participants from various market sectors* (Moore, 1993).

Moore's ecosystem approach identified the following *key categories*:

- a *central (focal) firm (FF)*, around which the business ecosystem is built;
- *various economic subjects* that are *direct participants* in this business ecosystem (the main ones being *suppliers* and *complementors*) (Figure 1), as well as participants that *indirectly* influence its functioning;
- *connections between participants* in the business ecosystem, primarily their connections with the focal firm;
- a *shared value proposition (focal)*, the creation of which would either be impossible for each of the participants without this business ecosystem as an organizational structure, or would require significant investment.

A graphical representation of an ecosystem, quite general and at the same time simple, was given by Adner and Kapoor (2010) (Fig. 1).

Figure 1: A typical ecosystem with key participants



Source: Adner and Kapoor (2010).

According to Moore (1996), a **business ecosystem** is an organizational structure consisting of a *focal firm and its environment*, as well as *the integrative links* between them that create a *synergy effect*-providing its participants with *additional resources* to achieve a common goal. The basic postulates laid out by Moore have subsequently often been used as a starting point in studies on ecosystems, when authors apply these ideas to the specifics of their research. For example, it has been shown that *ecosystem boundaries* can be open or closed (Ritala&Almpanopoulou, 2017). However, if the boundaries are permeable, - the limits of an ecosystem are difficult to define (Autio & Thomas, 2014), and economic agents can even be members of multiple ecosystems (Iansiti&Levien, 2004).

It should be noted that the term "**ecosystem**" can be used in relation to a specific firm, or to several firms operating in a competitive market within a limited geography, or to companies around the world within one of the areas of activity, etc. Thus, we can talk about the construction of a business ecosystem both at the level of individual infrastructure facilities and at the regional level (Filimonov et al., 2021).

Currently, the general concept of a *business ecosystem* that we support is as follows: an "**ecosystem**" as an organizational and economic form of doing business is a *dynamically developing set of interdependent and interconnected subjects, interacting with each other and with the environment*, aimed at achieving a *single goal - the joint creation of a value (focal) proposition that they could not realize separately* (Moore, 1993; Adner& Kapoor, 2010; Adner, 2017; Jacobides et al., 2018).

And if we draw on the ideas of the founder of *systems theory*, Ludwig von Bertalanffy, about what a "system" is, then an ecosystem is presented as an open, complex, self-organizing, self-regulating, and self-developing system, characterized by incoming and outgoing flows of matter and/or energy (von Bertalanffy, 1969). Nowadays, we could add "*and information.*"

Thus, the ideas of the unity of all living things in nature, their interactions, and the determinacy of their processes, which date back to ancient times, acquired a modern economic interpretation at the turn of the 20th and 21st centuries.

IV. Critical Analysis of Ecosystem Definitions in the Literature

We will examine definitions of ecosystems cited from well-known publications by leading experts in this field, supplemented by our comments (Table 1).

Table 1: Systemic Analysis of Ecosystem Definitions

Author	Definition of Ecosystem	Our Comments
Kapoor (2018, p. 1-16)	"An ecosystem encompasses a set of actors that contribute to delivering value to the user of a focal offering, the domain of which is defined by a specific study... This offering may be a product (good or service, technology) developed with or without the use of a certain digital platform."	There is nothing in this definition that distinguishes an ecosystem from a supply chain, whose participants also contribute to a certain value proposition, which also includes users as one of its subjects and may or may not use a digital platform.
Adner (2017, p. 39-58)	"I propose the following definition of an ecosystem... :Ecosystems as the alignment structure of the multilateral set of partners that need to interact in order for a focal value proposition to materialize."	It is incorrect to include the future intentions of partners in the definition of an ecosystem (regarding the fact that "its elements need to be brought into alignment," that is, an alignment procedure needs to be carried out), and other organizational forms of doing business also offer a value proposition.
Hannah, & Eisenhardt (2018, p. 3163-3192)	"An ecosystem is defined as groups of firms that produce products or services and whose combined efforts represent a coherent solution (Adner, 2012, 2017)."	The authors cite one of Adner's definitions of an ecosystem, in which an ecosystem is no different from, for example, a supply chain.
Jacobides, et al. (2018, p. 2255-2276)	"An ecosystem is a form of organizing economic activity that is linked by specific types of complementarities... Ecosystems ... are not hierarchically managed; rather, they are interacting firms combined on the basis of modularity and connected together without the possibility of relocating their collective investments elsewhere. That is, ecosystems create added value by coordinating the interdependencies of their partners through sets of roles, thereby eliminating the need to conclude individual contractual agreements with each of them."	This definition does not distinguish an ecosystem from other forms, such as a supply chain, and "activity" cannot be "linked by certain types of complementarities." It is the subjects that are linked, not the organizational forms. Other forms of business organization are not hierarchically managed and often utilize the principle of modularity. For example, any virtual organization utilizes partnerships and the principle of modularity. Dependencies between partners are coordinated through sets of roles in any business, since Brandenburger and Nalebuff (1996), who proposed the game theory perspective on business, did not impose restrictions on the type of business or its organizational form.

Source: prepared by Egor Kapitanov.

The comments in Table 1 suggest that ecosystem properties such as

- the presence of a common focal offering for its participants,
- interdependence and complementarity of ecosystem subjects,
- the distribution of roles among partners,
- the inclusion of users among ecosystem subjects,
- the use of digital platforms,
- the absence of hierarchical governance, and
- the application of the principle of modularity,

- described in detail in numerous articles on this topic, - are not characteristic features of an ecosystem, which uniquely to it as a common economic entity and, therefore, cannot form the basis for its definition. To identify a fundamental property of an ecosystem that can form the basis for its definition, let's consider the relationship between the concepts of "system" and "ecosystem."

V. The Relationship between the Concepts of "Ecosystem" and "System"

The concept of "system" is used when describing a complex phenomenon or object with components serving various purposes and interconnected by common principles of functioning.

It follows that a system is an ordered set of interconnected elements that form a unity and share a common functional purpose.

In this case, an element is understood as a basic unit, in which detailed consideration is given not so much to its own structure as to the specific properties necessary for the construction and operation of a particular system. This is the smallest unit possessing the basic properties of a given system and having a limit of divisibility within it. The minimum number of elements in a system is two. Moreover, the connections

between elements *within a system* are much stronger than their connections with elements of other systems, so it is important to characterize the system as *a holistic entity* consisting of interconnected elements.

Since the structure of the elements varies, the system is also characterized by the concept of "diversity".

A system is formed as follows:

1. First, consider *a non-empty set of diverse elements* ($n \geq 2$).

For $n = 3$, this is (a_1, a_2, a_3) .

2. Next, obtain *an ordered set of elements* in the set if the diversity of elements can be divided by individual characteristics.

Ordered means that this is either (a_1, a_2, a_3) , or (a_2, a_1, a_3) , or (a_3, a_1, a_2) , etc.

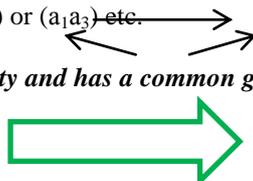
3. The ordered set of elements is supplemented by *a set of relationships*, which forms *a structure* and signifies the formation of *an organization*.

We add relationships $(a_1 \rightarrow a_2 \rightarrow a_3)$ or $(a_1 a_3)$ etc.

a_2

4. An organization that forms *a unity and has a common goal for all its constituent elements* becomes *a System*. For the first example, this is:

$a_1 \rightarrow a_2 \rightarrow a_3$



Every system has an *organization*, but not every organization is *a system*. Only *a shared purpose* across all its elements makes an organization a system. *An ecosystem*, whose members *jointly create a value proposition* and thus share a *common purpose*, is not only an organizational form but also a *system*. Therefore, the inclusion of the word "system" in the term "ecosystem" is entirely justified.

Let's consider how the properties of *a system* are interpreted within the concept of "ecosystem" in the work of one of the leading experts on this topic. We'll examine the interpretation of the concept of "ecosystem" in Adner's (2017) study of the "*elements*" of its structure. These are the following "*four elements*," the essence and role of each of which we will examine.

1. "*Activities*, which specify the discrete actions to be undertaken in order for the value proposition to materialize" (Adner, 2017, p. 43). - This is *the overall goal* (and purpose) of the system's elements (ecosystem subject). Indeed, *the overall goal of ecosystem participants* is the defining element for the entire ecosystem to be a system - and this goal is called *the ecosystem's value proposition*.

2. "*Actors*, which are the entities that undertake the activities" (Adner, 2017, p. 43). - Ecosystem subjects are *the elements of the system*.

3. "*Positions*, which specify where in the flow of activities across the system actors are located and characterize who hands off to whom" (Adner, 2017, p. 43). - This is the *place of an element* (ecosystem subject) in the sense of *ordering*.

4. "*Links*, which specify transfers across actors, ... these links need not have any direct connection to the focal actor" (Adner, 2017, p. 43). - It is clear that these are *connections* between elements of the system.

According to Adner (2017), these four "elements," taken together and in interdependent collaboration, characterize the pattern of actions of subjects necessary to materialize the *ecosystem's value proposition*. In reality, we see a listing of the conditions and stages of system construction described above, but in the language of economics and in a different order.

Thus, the presence of the "*system*" part in the term "ecosystem" is entirely reasonable. What is missing, then, for an *ecosystem as a system* to justify its second part - "ECO"? For a "system" to become an "*ECOsistem*," it is important to highlight a *characteristic property* noted by both Moore and Bertalanffy, but insufficiently emphasized in subsequent research. This property is most clearly evident in the comparison of an ecosystem as an organizational form with *a supply chain*. To allay the mystery, we will state that this is *the connection between the ecosystem and its environment*, its external context, as clearly illustrated in Figure 2.

VI. The Relationship between the Concepts of "Ecosystem," "Value Chain," and "Supply Chain" (Kapitanov, 2025)

The fundamental work on the topic of ecosystems is the study by Adner (2017) in the article "*Ecosystems as Structure*." However, a more logical comparison of organizational and economic forms should begin with a consideration of the "value chain" concept.

The term "*value chain*" (VC) was coined by Michael Porter in his book "*Competitive Advantage: Creating and Sustaining Superior Performance*" (1985). His chain includes *only the focal firm*, within which the following activities are performed: *design, production, marketing, delivery, and support of the released product*, which collectively create value for the customer. In VC, these activities are *interdependent*. The concept of VC is analyzed within a *microeconomic framework*.

The term "**supply chain**" (SC) was first mentioned in literature around 1982, when Keith Oliver, a consultant at *Booz Allen Hamilton*, used the term "*Supply Chain Management*" (SCM) in an interview with the *Financial Times* magazine, denoting an integrated approach to managing *supplies, production processes, and logistics*. Thus, a **supply chain** is a linear network of companies focused on the *production, distribution, and delivery of goods/services/information from raw material suppliers to end consumers*. The actors of an SC include *suppliers, manufacturers, distributors (logistics firms), retailers and consumers*, who jointly participate in the creation of a value proposition (focal product) (Mentzer et al., 2001). The central firm in an SC is called the "*leader firm*."

Although the term "*Supply Chain*" may have appeared earlier, in the 1980s, it began to actively develop in academic literature in the early 1990s, when the concept of *supply chain management (SCM)* became key in the fields of logistics and operations management. Thus, **SC**-concept predates the concept of "ecosystem," although it began to be widely studied around the same time.

Finally, the term "**ecosystem**," analyzed above, is a dynamically evolving set of subjects *interacting with each other and the environment* to achieve a *common goal* (the creation of a focal value proposition). The concept of "ecosystem" is analyzed within the framework of *macroeconomics*, and it allows to study the contribution of external actors to the value creation of a *focal firm* (Kapoor, 2018).

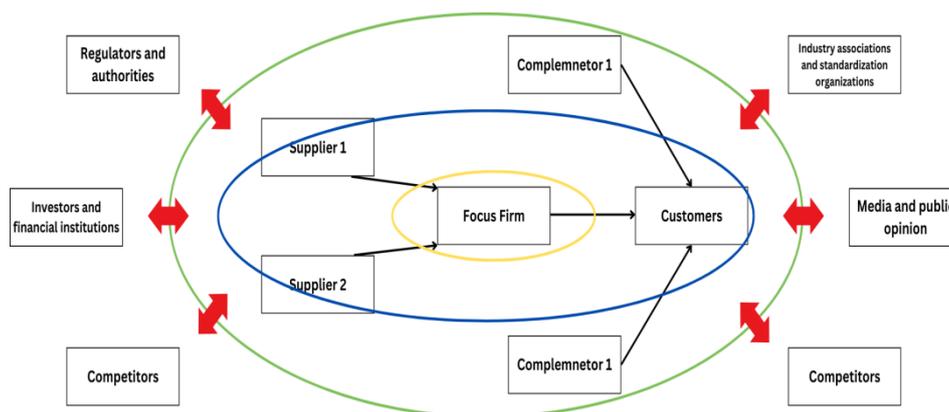
In Figure 2, the yellow oval represents VC, and the blue oval represents SC. In the same figure, the ecosystem is represented by the green oval. The connection to the external environment is indicated by red arrows. Clearly, the introduced concepts are interconnected according to the "Matryoshka doll" principle.

Thus, **the fundamental difference** between an ecosystem and the other constructs discussed is **its connection to the external environment**.

Remind, that the term "**ecosystem**," as defined by L. Von Bertalanffy (1969), the founder of systems theory, is a dynamically developing *set of entities interacting with each other and the environment* to achieve a *common goal* (the creation of a focal value proposition). Jacobides et al. (2018) also believe this, building on the view of Teece (2007), who asserted that an ecosystem is both an environment to which it must respond and be able to control. Jacobides notes that the influence of the environment extends to the *dynamic capabilities* of the ecosystem, and hence its ability to create a *sustainable competitive advantage* (Jacobides et al., 2018).

It's interesting to note the connection between the three constructs discussed and the gradually introduced variations of the *value-added (VA) concept* within the framework of *Value-Based Management (VBM)*. As one of the postulates of VBM states, VA measures the increase in value resulting from management action and is *the primary criterion for management effectiveness*. Understanding the influence of the economic framework within which a business operates on the choice of valuation is especially important *for strategic management* specialists, as business valuation is one of the most important tools for managers assessing the effectiveness of a company's operations.

Figure 2: Graphic illustration of the relationship between the concepts of VC, SC and ecosystem



Source: prepared by Egor Kapitanov (Kapitanov, 2025).

The foundations of VBM, as a modern approach to strategic management theory, were developed in the late 1980s and early 1990s by Alfred Rappaport, a professor at the Kellogg Graduate School of Management at Northwestern University in the United States. In his 1986 book "*Creating Shareholder Value*" Rappaport introduced the concept of **Shareholder Value Added (SVA)**, which takes into account the benefits of direct participants in the investment process (owners, investors, creditors, and management). (Rappaport, 1998), This indicator (SVA) provides an assessment of *the effectiveness of a company's operations and the work of its*

management when viewed as a value chain (VC) according to M. Porter. This was the first model for assessing the growth of a company's value.

More recently, **Stakeholder Value (STV)** and *stakeholder-focused management* (Jensen, 2001) have come to the forefront in strategic management publications. Within this framework, in the early 1990s, Harvard Business School professors Robert Kaplan and David Norton developed a model for managing corporate value, known as **the Balanced Scorecard (BSC)** (Kaplan & Norton, 1997). It has been called the management equivalent of *stakeholder theory*, which now includes *employees, customers, suppliers, the local community, and government*. Expressing the interests of many stakeholders, the BSC offers a specific performance indicator for each, thus becoming a *multi-criteria metric*. It examines four key areas: *supply chain (SC) and procurement, marketing and sales, management, and innovation*.

Finally, in the first decade of the 21st century, practitioners reconsidered the theoretical foundations of VBM, incorporating *principles of corporate social responsibility* into its system. Trade unions and "socially responsible" investors began demanding attention not only to issues such as customer and supplier needs but also to environmental concerns, leading to the proposal of a new concept - **the concept of shared value (CSV)** (Porter & Kramer, 2006). This *third concept* considers a firm's *usefulness to society as a whole*, adding social responsibility indicators, *including environmental requirements*, to its evaluation criteria. Emphasis on a company's results and financial performance should be established with an understanding of its responsibility to society. This view was shared by both Michael Porter and Mark Kramer (2011). This *value for all stakeholders* can measure the contribution of *all ecosystem participants*.

Let's pay closer attention to the differences between *supply chains and ecosystems* (Table 2).

Table 2: Differences between Supply Chain and Ecosystem (Kapitanov, 2025)

Aspects	SupplyChain (SC)	Ecosystem
Definition	<i>Supply chain - a linear network of companies and organizations focused on producing, distributing, and delivering goods or services from raw material suppliers to end consumers</i>	<i>Ecosystem - a dynamic and evolving network of companies, that jointly create value</i>
Scope	<i>Linear, inter-firm - focuses on the flow of goods, services, and information between direct business partners</i>	<i>Network, multi-industry - includes interactions of direct and indirect participants of the ecosystem</i>
Structure	<i>Sequential, linear</i>	<i>The ecosystem is more collaborative, flexible and dynamic, taking into account rapid changes and external influences</i>
Focus	<i>Flow of goods and cost reduction. SC is focused on operational efficiency</i>	<i>Co-creation of value and innovation</i>
Participants (Subjects)	<i>Suppliers, manufacturers, retailers, distributors (logistics) and consumers</i>	<i>Key players in the supply chain (suppliers, manufacturers, distributors, retailers, consumers), as well as: complementary companies, regulators and government agencies, technology companies, research institutes and universities, investors and financial institutions, and even competitors</i>

Source: prepared by Egor Kapitanov based on Legenvre et al. (2022).

That *supply chains* and *ecosystems* differ from a theoretical perspective and are used differently in practice was demonstrated by Legenvre et al. (2022). Our understanding of the differences between SC and ecosystems, based on this article and some McKinsey materials, is reflected in Table 2, where these differences are presented on various aspects.

While *supply chain subjects* are generally focused on improving *operational efficiency*, - ensuring uninterrupted product flow, and reducing costs, - *ecosystem subjects* are focused on *collaboration, innovation, co-creation of value, and increased competitiveness*.

The differences between these OEFs also manifest themselves in *the unique role of the focal firm* in the ecosystem compared to the traditional *supply chain leader*, as shown in Table 3.

Thus, Figure 2 and Table 2 demonstrate the structural and subjective differences between a supply chain and an ecosystem, in addition to the differences identified between the leading firm and the FF, reflected in Table 3. Supply chains do not contain *complementors*. This is one of the key differences, which plays an important role in *studying the integration process* in SCs and ecosystems.

Table 3: Comparison of the Functioning Features of a FF in an Ecosystem and a Supply Chain Leader

Aspect	Leader of the Supply Chain	Focal Firm in the Ecosystem
Approach to Control	<i>Direct – through ownership and contracts</i>	<i>In addition to the direct approach to control, an indirect one is also used – influence through incentives</i>
Management Structure	<i>Linear, sequential, hierarchical</i>	<i>The management structure is dynamic, with an impact on an open network of interdependent and complementary subjects</i>

Aspect	Leader of the Supply Chain	Focal Firm in the Ecosystem
<i>InnovationModel</i>	<i>Internal R&D</i> and a focus on <i>operational efficiency – cost effectiveness</i>	In addition, emphasis is placed on <i>external</i> partners and joint innovations with them, enabling the achievement of <i>strategic</i> advantages
<i>DependenceonOtherParticipants</i>	<i>Low</i> – the leader strictly controls suppliers and distributors	<i>High</i> – the focal firm largely relies on complementary companies (complementors)
<i>Example</i>	<i>Toyota</i> (traditional supply chain in the automotive industry)	<i>Tesla</i> (typical ecosystem in electric vehicle production)

Source: prepared by Egor Kapitanov.

VII. Conclusions

So, Ludwig von Bertalanffy, who laid the foundations of systems theory, defined an "ecosystem" as an open, complex, self-organizing, self-regulating, and self-developing system characterized by incoming and outgoing flows of matter and/or energy (Von Bertalanffy, 1969). It is characterized by the presence of a number of components: organizational (including infrastructural), functional (business process), and managerial (including innovative).

This definition is based on the definition of "system", supplemented, as shown above, by the condition of the presence of a connection with the external environment (ecology), which justifies the presence of the "ECO" component in the name of the ecosystem.

Thus, the following novel aspects of this study can be noted, which can be assessed as the author's contribution to ecosystem theory:

- *New nuances in the understanding of the concept of "ecosystem"* are highlighted, allowing us to clarify the priority of its properties, identify its characteristic properties, and identify its connection with the concept of "system," which is important for a proper understanding of the essence of the concept of "ecosystem";

- *The differences between the concept of "ecosystem" and other organizational constructs, such as "supply chain" and "value chain," are demonstrated*, and a graphical interpretation of the relationship between these concepts is proposed;

- *The relationship between the three constructs examined and the value-added (VA) models used within VBM theory to assess the effectiveness of management and the company as a whole is established.*

It can be concluded that ecosystem research has now moved beyond the operationalization of this concept and the consideration of its specific aspects. However, the diversity of ecosystems identified in the specialized literature requires the development of a multi-criteria typology based on identifying key ecosystem attributes and their characteristics based on goals, structure, set of subjects, dynamics, etc. Currently, attempts to construct typologies are known only for specific types of ecosystems (e.g., innovation ecosystems (Klimas&Czakon, 2021)). But this is the topic of another article.

The development of ecosystem theory, achieved in part through a deeper and more precise understanding of its basic concepts, contributes to the expansion of the capabilities of the ecosystem approach (the "ecosystem perspective" according to Adner (2006)), which can be successfully applied by entrepreneurs and management to any business, MSE, universities, other social entities, etc.

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