

METODOLOGICAL ASPECTS OF THE FORMATION OF AN ENTREPRENEURIAL ECOSYSTEM

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Abstract

Purpose and aim of the study: *The purpose of the study is to determine the theoretical and conceptual foundations of the process of forming an entrepreneurial ecosystem. The task of the study is to summarize the theoretical and methodological support of the studied issues and to substantiate the methodological approach to the formation of an entrepreneurial ecosystem.*

Design /Methodology / Approach: *The study used general scientific and special methods: scientific abstraction, analysis and synthesis, induction and deduction, systemic and comparative analysis, structural and logical, an ascent from the abstract to the concrete, and the method of parametric estimates. The literature was selected using the databases Google Scholar, MDPI, Science Direct and Scopus.*

Main Findings: *The analysis of the theoretical and methodological aspects of the entrepreneurial ecosystem and the formation of its structure shows that there is no systematic approach to determining the links and nature of interaction (including inter-level interaction) between different participants of the entrepreneurial ecosystem. It has been established that the structure of entrepreneurial ecosystems is unique and is able to provide systemic support for entrepreneurial activity by providing access to markets, finance, human and intellectual capital.*

Originality: *The study reveals the process of formation of the entrepreneurial ecosystem in the aspect of developing a strategy for the entry of new enterprises into it.*

Implications: *The results of the study make it possible to synthesize the ideas of territorial models of innovation and entrepreneurship, to carry out strategic positioning of the enterprise in the entrepreneurial ecosystem in order to provide attractive value propositions for consumers in the long term.*

Keywords: *entrepreneurial ecosystem, concept, formation, structure, principles, new enterprises, strategic orientation, methodological tools.*

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Introduction

In recent decades, there has been a global and growing interest in the formation and development of entrepreneurial ecosystems, which are one of the key drivers of economic growth and contribute to the achievement of many sustainable development goals. Entrepreneurial ecosystems play a crucial role in achieving entrepreneurial success along the entire value chain, as they provide the necessary infrastructure, access to knowledge, and networking for business success. In addition, the value of individual enterprises is directly considered by the professional community in terms of the productivity of their innovation and entrepreneurial activities aimed at creating value not only for the entrepreneur but also for the wider society, which is reflected in the concept of the entrepreneurial ecosystem. Despite numerous studies of various aspects of the entrepreneurship process, the methodological aspects of the formation of an entrepreneurial ecosystem remain insufficiently developed, which makes it difficult to understand the strategic orientation of its participants, the degree of influence on entrepreneurial activity, and determines the relevance of the research topic.

The issues of defining the entrepreneurial ecosystem and forming its structure are addressed in the scientific works by Stevencon & Jarillo-Mossi (1986), Van de Ven (1993), Valdez (1998), Prahalad (2005), Cohen (2006), Isenberg (2010; 2011; 2014), Mason & Brown (2013), Malecki (2018), Spigel (2017; 2020), Spigel & Harrison (2018), Stam (2010; 2015), Stam & Spigel (2018), Wurth et al. (2022). The scientists have moved from research aimed at studying the role of entrepreneurs in ensuring the economic development of both regions and the country as a whole to developing the concept of an entrepreneurial ecosystem, which offers a special view of the clustering of economic activity, promotes the development of ecosystem strategies, innovation systems, the knowledge economy and national competitiveness policy.

At the same time, despite the positive results achieved, there is still no systematic approach to determining the links and nature of interaction (including inter-level interaction) between different participants in the entrepreneurial ecosystem, and assessing the synergistic effectiveness of their activities. Given the interest of politicians, scientists, entrepreneurs and society in building a new innovative structure of entrepreneurship to accelerate the country's economic growth and improve the welfare of citizens, the definition of principles and strategies for the formation of an entrepreneurial ecosystem deserves a comprehensive study in the theoretical and methodological dimension.

The purpose of the study is to determine the theoretical and conceptual foundations of the process of formation of an entrepreneurial ecosystem.

The task of the study is to summarize the theoretical and methodological support of the studied issues and to substantiate the methodological approach to the formation of an entrepreneurial ecosystem.

The scientific novelty of the study is to solve the most important scientific and applied problem - further development of the theoretical provisions of the entrepreneurial ecosystem, as well as to study the process of entry of new enterprises into entrepreneurial ecosystems.

Research methods - general scientific and special methods: scientific abstraction, analysis and synthesis, induction and deduction, systemic and comparative analysis, structural and logical, an ascent from the abstract to the concrete, method of parametric estimates.

The research period is 2022-2023.

Study results and discussion

The world economic science and international organizations, including the Organization for Economic Co-operation and Development (OECD), define the concept of an entrepreneurial ecosystem as holistic and interactive in nature (Mason & Brown, 2013), noting that it arose on the basis of such basic concepts such as regional agglomeration (Fujita & Thisse, 2002), innovative regional agglomeration (Sahenian, 1994), industrial agglomeration (Porter, 1990), (Feldman et al., 2005) national innovation systems (Lundvall, 1992) and national entrepreneurship systems (Acs et al., 2014), which shaped economic development at various levels.

Having examined the essence of these concepts that preceded the concept of an entrepreneurial ecosystem, we concluded that they differ in terms of goals, composition of participants, their role and nature of interaction in the created system, and generally reflect the evolution of approaches to entrepreneurship development in various time periods at the regional, sectoral and national levels.

It should also be noted that each of them contains important elements of entrepreneurial ecosystems, but none of them has a comprehensive systemic solution for not only the structure and institutions but also for each individual entrepreneur who should be supported to ensure their own and the economy's growth.

Given the peculiarities of doing business in today's uncertain environment, the uniqueness of the entrepreneurial ecosystem approach is that it provides an economically sound and dynamic perspective for creating opportunities for new activities and industries.

Therefore, the concept of an entrepreneurial ecosystem is intended to become the basis on which the ideas of territorial models of innovation and

entrepreneurship are synthesized, and it is this concept that is the answer to the challenges of a turbulent external environment.

A review of the literature shows that most studies in this area indicate that, despite various common characteristics, each entrepreneurial ecosystem is different from the other.

The structure of entrepreneurial ecosystems is unique and may differ in different geographical communities, but its important feature is the ability to provide systemic support for entrepreneurial activity by providing access to markets, finance, human and intellectual capital.

In addition, we agree with the authors who argue that the application of systems theory is relevant in the study of entrepreneurial ecosystems, as they consist of elements (components) that cannot function well in isolation and, as a result, must interact with each other to lead to a successful or well-functioning entrepreneurial system (Daniel et al., 2018).

The study by Mason & Brown (2013) attempts to summarize the characteristics of successful entrepreneurial ecosystems. In their opinion, they include:

1. Previous history of business or industry.
2. Presence of «large operating enterprises».
3. Presence of a success story.
4. Growth of entrepreneurial ecosystems through the creation (or entry) of new enterprises with innovative potential in the context of business, social recovery and economic growth in the regions where they are created.
5. Communication links.
6. Cultural characteristics.
7. Availability of finance.
8. Interaction with universities.
9. Possibility of obtaining the services of specialized specialists.

In our opinion, these signs are not definitive, and their list may change influenced by various factors of the investment and business environment.

In other words, the process of forming an entrepreneurial ecosystem requires an individual approach that correlates with the development of existing entrepreneurial assets in a particular region.

Given the above, we can distinguish the following basic principles of entrepreneurial ecosystem formation, which reflect not only the interdependent and multilevel nature of their participants but also the process of value generation and creation in them:

- transboundary processes of the entrepreneurial ecosystem;
- self-organization, self-regulation, self-development;
- joint generation and use of information, innovation, and intellectual resources;

- unlimited project implementation in time (one project initiates the implementation of others);
- dynamism, flexibility, openness to external challenges;
- customer focus;
- network organizational design;
- collaboration based on partnership, trust, cooperation and mutual assistance;
- balance of goals and objectives;
- cyclicity (new knowledge as the "energy" of exchange between partners);
- priority of resource saving policy;
- preservation and development of the potential of each project participant.

By following these principles, entrepreneurial ecosystems at the micro level can create competitive advantages and value for individual enterprises and market segments, and thus shape the results of regional innovation (Cunningham et al., 2018).

It should be noted that to date, a limited number of scientific works have been devoted to the study of an interesting and complex area of entrepreneurial ecosystem formation - the process of new enterprises entering entrepreneurial ecosystems (Eiriz & Barbosa, 2022; Kuratko et al., 2017)

The arrival of new businesses can be beneficial for developing the capacity and potential of entrepreneurial ecosystems, but it can have some unintended consequences (Audretsch et al., 2019)

In our opinion, given that the formation of an entrepreneurial ecosystem is a resource-intensive process with an uncertain outcome, the decision to enter a new enterprise should be strategically justified.

In order to determine the strategic orientation of an enterprise, we propose a methodological toolkit for strategic analysis based on the method of parametric estimates.

This method consists of calculating compensatory and non-compensatory estimates of the company's parameters. During a compensatory assessment, the weaknesses of the enterprise can be compensated for by its strengths. In this case, additive criteria are used to compare different companies. In a non-compensatory assessment, the weaknesses of an enterprise cannot be compensated for by its strengths, and lexicographic criteria are used.

Parametric analysis determines the impact of external and internal factors on the criteria of specific strategies. When forming a set of criteria, one should limit oneself to a small number of basic criteria.

The sequence of strategic analysis of an enterprise based on the method of parametric estimates consists of the stages shown in Fig. 1.

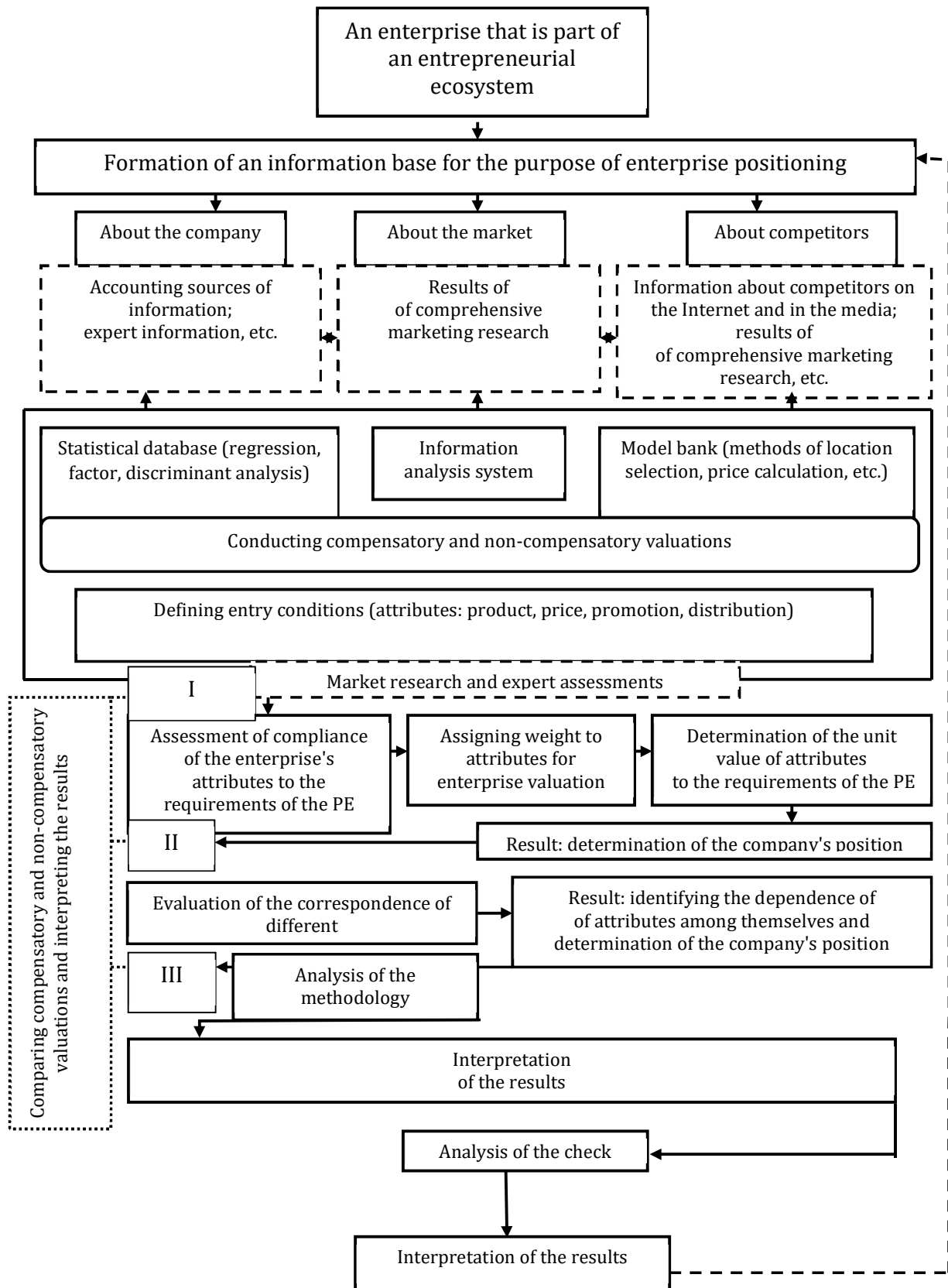


Fig. 1 Stages of strategic analysis based on the method of parametric estimates (compiled by the author)

It should be noted that it is advisable to use the function of importance of enterprise attributes as an integral indicator for comparison. Determining this function is a difficult task.

In our opinion, it is necessary to apply a method of assessing the importance of attributes based on diagnosing the degree to which their real values for the consumer correspond to the desired ones. It is assumed that the greater the importance of each particular attribute for the consumer is, the more fully its characteristics meet the consumer's needs.

In a compensatory valuation, the overall importance of the company's parameters (U) can be determined by the following formula:

$$U = d_1 \times T + d_2 \times Z + d_3 \times P + d_4 \times R, \quad (1)$$

where T – is an indicator that indicates the degree of compliance of the enterprise's parameters with the consumer's requirements;

Z – is an indicator that indicates the degree of compliance of the company's price parameters with the consumer's requirements;

P – is an indicator that indicates the degree of compliance of the company's promotion parameters with consumer requirements;

R – is an indicator that indicates the degree of compliance of the company's distribution parameters with the consumer's requirements;

d_1, d_2, d_3, d_4 – coefficients indicating the importance of the attributes T, Z, P, R , respectively.

Additionally, the weighting factors for these parameters ($d_1; d_2; d_3; d_4$) must meet the evaluation requirements determined by the formula:

$$0 \leq d_1 \leq 1; 0 \leq d_2 \leq 1; 0 \leq d_3 \leq 1; 0 \leq d_4 \leq 1; d_1 + d_2 + d_3 + d_4 = 1 \quad (2)$$

Single parametric indicators can be divided into five different groups.

The first group includes indicators whose increase in value is desirable for the buyer.

An example is improving product quality. A single parametric indicator for this group can be calculated using the formula:

$$q_i^1 = \frac{P_i - P_i^{min}}{P_i^{\wedge} - P_i^{min}} \quad (3)$$

where P_i^{min} – is the minimum value of the i -th parameter at which the company's products are allowed to enter the market;

P_i^{\wedge} – is the value of the i -th parameter at which the buyer fully satisfies his/her needs;

P_i – is the real value of the i -th parameter of the enterprise under analysis.

The condition for the entry of the company's products into the market according to the indicators of the first group will be the restriction reflected in the formula:

$$P_i \leq P_i^{min} \quad (4)$$

The second group includes indicators whose reduction is desirable for the buyer. An example is a decrease in the purchase price. The single parametric indicator for this group is calculated by the formula:

$$g_i^2 = \frac{P_i^{max} - P_i}{P_i^{max} - P_i^\wedge} \quad (5)$$

where P_i^{max} – is the maximum value of the i -th parameter at which the company's products are allowed to enter the market.

The condition for the entry of the company's products into the market according to the indicators of the second group will be the restriction reflected in the formula:

$$P_i \leq P_i^{max} \quad (6)$$

The third group includes indicators that are desirable for consumers. The unit indicator for this group will be equal to one (i.e., $g_i^3 = 1$) if the company has one, $g_i^3 = 0$, if it is missing.

The fourth group includes indicators whose absence is desirable for the consumer. The unit indicator for this group will be equal to one (i.e., $g_i^4 = 1$) if it is not in the product, and $g_i^4 = 0$, if available.

The fifth group includes indicators whose deviation in both directions from the normatively specified parameter is unacceptable for the consumer.

A condition for the entry of a product into the market according to the quality indicators of the fifth group will be the restriction represented by the formula:

$$P_i^{min} \leq P_i \leq P_i^{max} \quad (7)$$

There are two possible cases here: when the parameter exceeds the desired level and when it is below this level. According to each case, the unit parametric indicator will be calculated by the ratio:

$$\left\{ \begin{array}{l} \text{якщо } P_i \geq P_i^\wedge, \text{ то } g_i^5 = \frac{P_i^{max} - P_i}{P_i^\wedge - P_i^{min}} \\ \text{якщо } P_i \leq P_i^\wedge, \text{ то } g_i^5 = \frac{P_i - P_i^{min}}{P_i^\wedge - P_i^{min}} \end{array} \right. \quad (8)$$

In a non-compensatory valuation, the overall significance of the company's attributes is calculated using the formula:

$$U = \sum_{i=1}^n 10^{-(i-1)} g_i \quad (9)$$

where n – number of indicators taken into account by the consumer when choosing a counterparty.

It should be noted that the order in which indicators are taken into account is determined by their priority for the consumer.

The methodology for calculating parametric indicators in non-compensatory valuation g_i is similar to the methodology used in the compensation assessment, but, firstly, when calculating the third and fourth group indicators g_i is given importance 0.9, not one; second, if the value g_i , calculated for other groups of indicators exceed the value of 0.9, they should be standardized. Normalization is carried out taking into account all suppliers of similar products to the market for homogeneous customers. The normalized value of a single parametric indicator for an enterprise of any group is calculated by the formula:

$$g_i^{norms} = 0,9 \times \left(\frac{g_i}{g_i^{max}} \right) \quad (10)$$

where g_i – is the calculated value of the i -th parametric indicator of the enterprise according to the compensatory valuation method;

g_i^{max} – is the maximum value of the i -th parameter for all enterprises in the selected market.

When positioning the company's products in the selected market, it is necessary to determine two characteristics:

1. The characteristic of compliance of the enterprise's attributes with the requirements of the consumer;
2. The characteristic of the correspondence of attributes between each other.

The unit importance of attributes, calculated according to the compensatory and non-compensatory methods of assessing the enterprise's position described above using the formulas (Acs et al., 2014) and (Isenberg, 2010), is the first characteristic of positioning. However, the value of the unit significance does not reflect the degree of correspondence of the attributes of enterprises between themselves. Therefore, the second characteristic of positioning is to determine for each enterprise the distance between it and the enterprise with the «ideal» value of the parameters.

The distance between the studied enterprise and the «ideal» one (ξ_i) is determined by the formula for the entire set of parameters n :

$$\xi_i = \sqrt{\sum_{i=1}^n (g'_i - g_i)^2} = \sqrt{\sum_{i=1}^n (1 - g_i)^2} \quad (11)$$

Thus, the parametric analysis based on attributes using compensatory and non-compensatory valuation methods allows us to identify the position of an enterprise relative to its competitors in the selected market segment.

Conclusions

The results of the study revealed that entrepreneurial ecosystems are the most progressive modern concept of entrepreneurship development in general, which promotes the development of ecosystem strategies and adheres to such criteria of sustainable development as environmental responsibility, equality and social inclusion, financial integration and good governance. In today's business environment, the strategic factors that are crucial for the effective implementation of an entrepreneurial ecosystem are: the availability of innovative developments integrated into the global innovation space that provide competitive advantages to their participants; deep and coordinated cooperation of all ecosystem elements that interact in a very complex and idiosyncratic way, and maximize their potential and promote synergistic growth. In this regard, the question arises of theoretical substantiation of the process of formation of entrepreneurial ecosystems in the context of the concept of an entrepreneurial ecosystem.

In the process of defining the essence of the concept of entrepreneurial ecosystem, it was found that the concepts that preceded it contain important elements of entrepreneurial ecosystems, but, unlike it, do not provide systemic support for entrepreneurial activity by providing access to markets, finance, human and intellectual capital.

The results of generalizing the features of successful entrepreneurial ecosystems show that their list may change influenced by various factors of the investment and business environment, and as a result, the formation of an entrepreneurial ecosystem requires an individual approach that correlates with the development of existing entrepreneurial assets in a particular region. Based on this, we have identified the basic principles of formation of entrepreneurial ecosystems, which reflect not only the interdependent and multi-level nature of their participants but also the process of generating and creating value in them.

The analysis of literature sources has shown that to date, a limited number of scientific works have been devoted to the study of one of the areas of formation of entrepreneurial ecosystems - the process of entry of new enterprises into entrepreneurial ecosystems. Given that the formation of an entrepreneurial ecosystem is a resource-intensive process with an uncertain

outcome, the decision to enter a new enterprise should be strategically justified.

In order to determine the strategic orientation of an enterprise that is part of an entrepreneurial ecosystem, we propose a methodological toolkit for strategic analysis based on the method of parametric estimates. The application of this method allows us to carry out strategic positioning of an enterprise in the entrepreneurial ecosystem: to determine the impact of external and internal factors on the criteria of specific strategies, the competitive position of an enterprise in a particular market segment, the achieved level of competitiveness due to the synergistic effect of interaction of many components, and, in general, to provide attractive value propositions for consumers in the long term.

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