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## THE FORMATION OF A STARTUP ECOSYSTEM AS A BASIS FOR INCREASING ENTREPRENEURIAL ACTIVITY: THE EXPERIENCE OF UKRAINE

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**Abstract.** *The development of entrepreneurship is the key to the economic growth of a democratic country with a market economy. The role of state and local authorities is to promote and increase entrepreneurial activity. An essential role in the development of entrepreneurship is played by startups as a special form of management, which is mainly aimed at innovative solutions to problems and satisfaction of needs. That is why the question arises in forming a complete and complex ecosystem for the development of entrepreneurship, where a startup ecosystem can be singled out separately.*

*The purpose of this study is to develop a structural and logical model of a startup ecosystem based on the example of Ukraine.*

*As a result of using a set of scientific research methods, a number of results were obtained.*

*Based on the methods of structural and logical generalization, analysis, and synthesis, a theoretical interpretation of the basic categories of startup and startup ecosystem was provided.*

*The study of literary sources on the essence of the startup ecosystem made it possible to establish its hierarchy and equality, which affects its content. Hierarchical demarcation (structuring) of the startup ecosystem of Ukraine was carried out, where 4 levels were distinguished: international (global), national, regional, and local. Features of each level are described.*

*Based on the analysis of the constituent ecosystems, a structural and logical model of the startup ecosystem of Ukraine was developed and a description of its structural elements was carried out.*

*Based on the structuring and comparative analysis of the components of the national startup ecosystem and foreign ones, directions for the further development of the startup ecosystem of Ukraine have been determined.*

*Special attention is paid to the analysis and features of the formation of startup ecosystems at the local level, which includes the university level. The Ukrainian university start-up ecosystem and the stages of its implementation are presented in the example of the start-up ecosystem of the O.M. Beketov Kharkiv National University of Urban Economy, which is based on the theory of SMART specializations. The peculiarities of the activity and development of the start-up ecosystem of Ukraine in the conditions of the war with Russia have been determined.*

**Keywords:** startup, ecosystem, startup ecosystem, SMART specialization, entrepreneurship

**JEL Classification:** J 23, M 13

## **1 Introduction**

The development of entrepreneurship is the key to the economic growth of a democratic country with a market economy. The role of state authorities and local governments is to promote and develop an entrepreneurial activity. This is manifested through the development and use of a complex set of various tools and programs that lead to the formation of a favorable business environment. Startups play an essential role in the development of entrepreneurship as a special form of activity aimed at innovative solutions to problems and meeting needs. Therefore, the question arises of forming a completely integrated ecosystem of entrepreneurship development, where the ecosystem of startups can be singled out separately. The formation of such a complete ecosystem should be created on the basis of end-to-end interaction of subjects at all levels. It is the aforementioned that determines the need to study the issue of modeling the startup ecosystem as a prerequisite for increasing entrepreneurial activity in Ukraine.

## **2 Literature Survey**

Among the prominent issues that were solved in the paper by the authors is the categories recognition of the concepts of "startup" and "startup ecosystem". For this purpose, a set of definitions of both foreign and domestic scientists and startup entrepreneurs' opinions were analyzed in the paper.

Thus, Stacey Caprio [1] believes that «A startup is a company with less than 100 employees that is not yet publicly traded». Steve Blank and Bob Dorf [1] consider startups to be looking for a certain business model that is profitable and can be scaled in the future, while the company itself uses the existing model. Ye. Chazov [3] claims that a startup is a new, recently created company that builds its business on the basis of innovations or innovative technologies, has a limited amount of resources and plans to enter the market. The innovative technologies introduced can be global (that is, this innovation will be the one for the entire world) or local (that is, this technology and idea are borrowed, but will be an innovation in a specific region or country). Han, J.H. and Park, H.Y. [4] understand startups as individual businesses or corporations that have been operating for less than seven years since their inception. Fedorov R. K. [5] believes that a startup is a new type of entrepreneurial activity based on innovative technologies and based on the minimization of capital investments during its initiation.

It is worth noting that the authors did not reach a consensus on the definition of the concept essence. However, it is possible to substantiate the characteristic distinguishing features [6] of a startup, namely:

- innovativeness, new idea is the basis of startup, a way to solve a problem or satisfy a need, a new product, a new business model, something that will distinguish it from all other;
- high risk - since innovation is the basis, risks in all areas are increasing;
- rapid growth – startups are more growth-oriented than traditional businesses;
- scalability – the new business model can be extended to other regions, countries or areas;
- a small number of employees, a team approach to formation.

So, in the paper, the authors understand the startup as the initial stage of entrepreneurship, which is based on solving the problem with innovative methods and tools, the implementation of which involves the formation of economic and social value in conditions of high risk and the creation of a scalable business model.

However, the importance of a startup phenomenon for the economy has been empirically proven regardless of interpretation. On the one hand, they create jobs, and their active growth can significantly increase their number [7]. This ensures employment, including that for the younger generation. On the other hand, not all startups are able to pass the stage of formation and active growth and form a sustainable business on its basis. This, in turn, endangers those potentially created jobs. Yet, the economic effect of a successful startup is significant and manifests itself in various areas: economic development and stability, social relations, prestige and political weight of the region and the whole state. This is evidenced by the formed ecosystem, which includes a fairly large number of startups, starting with micro-enterprises that have grown to international companies.

Thus, let's take a closer look on the startup ecosystem, which Daniel Eisenberg considered as a set of interdependent objects within a certain region [8]. Jackson D. [9] believed that innovation ecosystems unite two important and largely separated economies - the knowledge economy, which develops on the basis of fundamental research, and the commercial economy, that is driven by the market. An innovative ecosystem is formed by a dynamic set of economic agents and institutions engaged in innovative activities, as well as by multidimensional internal connections – Bramwell A., Hepburn N., Wolfe D. A. Fedulova L. I., Marchenko O. S [11] consider a startup ecosystem to be a set of organizational, structural and functional components (institutions) and their relationships involved in the process of creating and applying scientific knowledge and technologies that determine the legal, economic, organizational and social conditions of the innovation process and ensure development of innovative activities both at the level of the enterprise and at the level of the region and the country as a whole according to the principles of self-organization.

The startup ecosystem is formed by people, startups at different stages of the life cycle, and various local organizations (physical or virtual), which interact with each other as a system for creating and scaling new startup companies. These organizations can be categorized as universities, investment companies, support organizations, research organizations, service companies (especially legal) and large corporations [12].

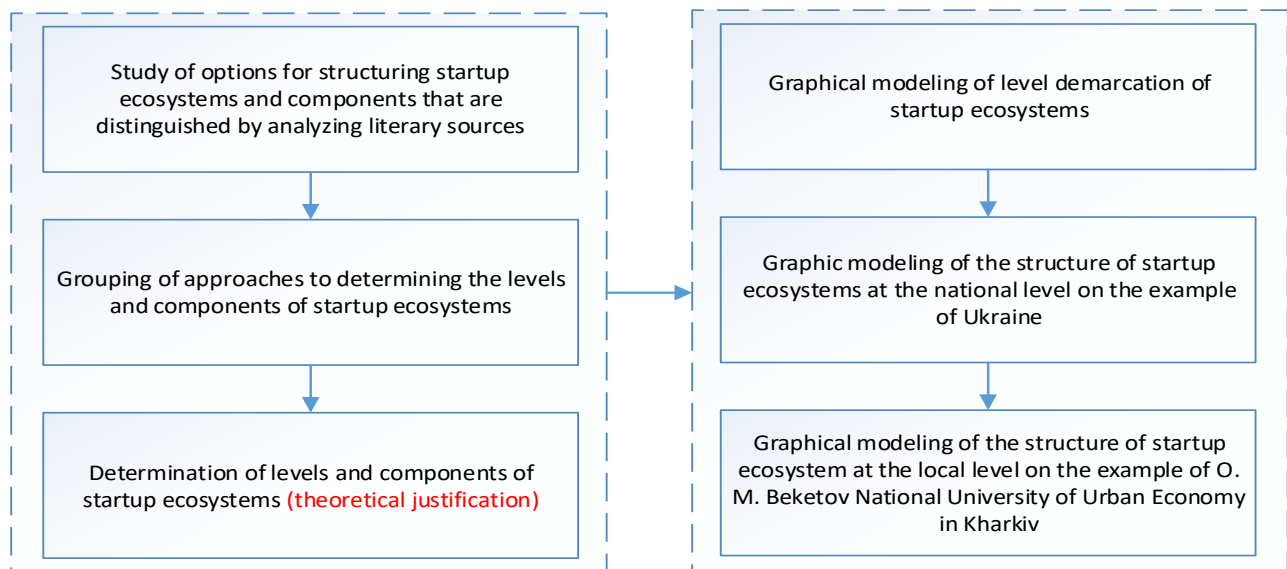
So, in the investigation, we consider the startup ecosystem to be a network that unites various subjects of the innovation process (universities, venture capital companies, marketers,

entrepreneurs, auditing and consulting agencies, etc.), which interact with each other based on certain rules.

Currently, the startup ecosystem is in an active phase of implementation, as stimulating the development of startups can lead to the development of entrepreneurship in the country in general. Experts also predict that a boom in startups is expected in Ukraine in the post-war period [13]. Despite the war, Ukrainian startups demonstrated resilience and continue to conduct their business [14], as evidenced by the results of a survey conducted by employees of the Ministry of Digital Affairs together with partners [15].

### 3 Methods

The research methodology involves structuring in several successive stages and a combination of methods. The frame of the investigation is presented in figure 1.



**Figure 1 Methodological frame of research on the formation of a startup ecosystem**

The research methodology involves the implementation of two blocks. The first block contains the definition and justification of the set of elements and levels of the startup ecosystem. For this purpose, a complex of analytical methods, grouping and structuring is used.

Based on the methods of structural and logical generalization, analysis and synthesis, a vision is formed regarding possible options for structuring the startup ecosystem.

Based on the grouping, the components of the startup ecosystem are substantiated and the number of its levels is determined.

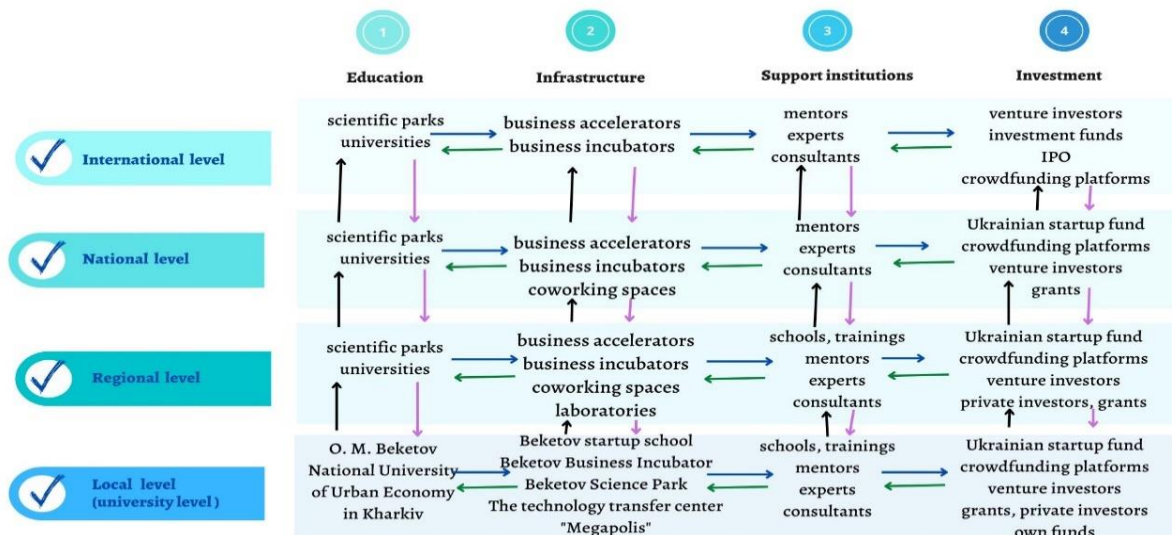
The second block is based on the results achieved within the first block and involves the use of modeling methods to build graphical models. Geometric, functional, information and structural models are distinguished depending on the properties of objects. A structural model represents the modeling object in terms of its structure and relationships both internally and externally. The information model is a system of data about the object and a description of data flows in the process of its functioning [16]. Since the startup ecosystem is a complex system that contains a set

of various elements that constantly interact with each other and with other systems of the external environment, as well as transfer data in the process of its operation, it is advisable to use a combination of two types of models.

This will make it possible to build a graphic information-structural model of the hierarchical (level) demarcation of the startup ecosystem; graphical information-structural model of the startup ecosystem of the national level on the example of Ukraine; graphical information-structural model of the start-up ecosystem at the local level on the example of O. M. Beketov National University of Urban Economy in Kharkiv.

### 4 Results

A hierarchical demarcation (structuring) of the startup ecosystem of Ukraine was carried out, where 4 levels were distinguished: international (global), national, regional and local. Features of each level are described. (figure 2).



**Figure 2 Structural and logical model of the startup ecosystem of Ukraine**

The international level of the startup ecosystem provides opportunities for the promotion and development of startups that have already shown their viability at all previous levels. At the international level, these startups can receive both mentoring support in international accelerators and business incubators, as well as financing opportunities from international venture funds, crowdfunding platforms and investment funds, as well as attracting money to the startup by entering the stock exchange through an IPO.

At the national level, among the elements of the startup ecosystem, there are elements that contribute to the development of startups at the state level. Among such elements should be noted the Ukrainian startup fund, which is a state fund created to develop and stimulate innovation in Ukraine. During the Russian aggression, the Ukrainian Startup Fund has developed a platform that will bring together those who can provide assistance to startups during the war and those who need this support now. From November 2022, it will launch a program of grant support for dual-



purpose projects to increase the country's defense capabilities and post-war reconstruction and will provide an opportunity to receive up to \$35,000 per project.

The regional level of the startup ecosystem is represented by elements that support startups in a certain region.

The local level of the startup ecosystem is presented on the example of the university level and described in detail below. All elements of the startup ecosystem are transmitting information between their levels and interacting.

The university startup ecosystem of the Ukrainian university and the stages of its implementation are presented on the example of the startup ecosystem of the O. M. Beketov National University of Urban Economy in Kharkiv, which is based on the theory of SMART specializations (figure 3).



**Figure 3 Startup ecosystem O. M. Beketov National University of Urban Economy in Kharkiv**

The structural elements of Startup ecosystem O. M. Beketov National University of Urban Economy in Kharkiv are:

- the BEKETOV STARTUP SCHOOL junior development school, which is intended for schoolchildren of the Kharkiv region and provides training and development of their own startup project, as well as its presentation at an all-Ukrainian (regional) competition;

- the startup school BEKETOV STARTUP SCHOOL is intended, first of all, for applicants, young scientists, teachers, as well as everyone who has their own idea or development for startup projects and provides training according to a developed training program, mentoring and expert support, pitching of startup projects and business plans and participation in the All-Ukrainian festival of startups. The university lecturers of the "Entrepreneurship and Business Administration" department participate in the international project "Entrepreneurial University", which is being implemented with the support of the Ministry of Education and Science of Ukraine and the public organization YEP in 2020-2022;

- the purpose of the Beketov Business Incubator is to provide infrastructure and consulting for youth entrepreneurship. Currently, the business incubator is focused specifically on the successful implementation of startups and business ideas and is a logical part of supporting promising startups that have graduated from the BEKETOV STARTUP SCHOOL. The creation and operation of the business incubator was carried out within the framework of the project "Business incubator for students, teachers and businesses" with the support of the Ministry of Foreign Affairs of Poland and thanks to the partnership with the international organization "Polish-Ukrainian Cooperation Fund PAUSI";

- Beketov Science Park, its activities are aimed at the development and commercialization of scientific, technical and innovative activities of the university;

- the technology transfer center "Megapolis" provides university-wide, national and international coordination support for technology transfer for all representatives of the local startup ecosystem O. M. Beketov National University of Urban Economy in Kharkiv.

The ecosystem of the university is based on the concept of SMART-specializations, coordinated with the Development Strategy of the Kharkiv region until 2025 and focused on the direction of SMART-city. It is shown in fig. 4.

Already now, the university is developing, together with leading scientists and practitioners of Ukraine and the EU, the program "Innovative cities: best practices of post-war reconstruction", aimed at the development of skills and qualifications that would allow the practical development of post-war reconstruction projects in Ukraine to begin in a short period of time.



**Figure 4 Smart directions O. M. Beketov National University of Urban Economy in Kharkiv**

Thus, O. M. Beketov National University of Urban Economy in Kharkiv has a complete startup ecosystem that contributes to the development of the entrepreneurial ecosystem of Ukraine and the Kharkiv region.

## 5 Conclusion

Based on the methods of structural and logical generalization, analysis, and synthesis, a theoretical interpretation of the basic categories of startup and startup ecosystems was provided.

The study of literary sources on the essence of the startup ecosystem made it possible to establish its hierarchy and equality, which affects its content. Hierarchical demarcation (structuring) of the startup ecosystem of Ukraine was carried out, where 4 levels were distinguished: international (global), national, regional, and local. Features of each level are described.

Based on the analysis of the constituent ecosystems, a structural and logical model of the startup ecosystem of Ukraine was developed and a description of its structural elements was carried out.

Based on the structuring and comparative analysis of the components of the national startup ecosystem and foreign ones, directions for the further development of the startup ecosystem of Ukraine have been determined.

Special attention is paid to the analysis and features of the formation of startup ecosystems at the local level, which includes the university level. The Ukrainian university start-up ecosystem and the stages of its implementation are presented in the example of the start-up ecosystem of the O.M. Beketov Kharkiv National University of Urban Economy, which is based on the theory of SMART specializations. The peculiarities of the activity and development of the start-up ecosystem of Ukraine in the conditions of the war with Russia have been determined.

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