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## Методологічні аспекти структуризації університетських інкубаторів

**Анотація.** Бізнес-інкубатори, що розміщуються в університетах, надають дослідникам та студентам першого рівня (бакалавр), другого рівня (магістр) та третього рівня (PhD) широкі можливості для самореалізації. Однак, такі інкубатори в першу чергу пропонують підтримку в консультуванні та розробці нових проєктів, таких як створення компетенцій у дослідженні та застосуванні нових технологій, натомість вони не забезпечують в повній мірі формування підприємницької культури та керівних навиків, необхідних молодим підприємцям для втілення ідей у реальність. У зв'язку з цим, важливо з самого початку розробити структуру внутрішніх та зовнішніх процесів інкубатора. Необхідно детально обґрунтувати виділення кожного елементу та визначити зацікавлені сторони і тип діяльності, що формує модель структури та функціональності університетського бізнес-інкубатора. Метою статті є розкриття методологічних аспектів, пов'язаних з формуванням структури та функціонування бізнес-інкубаторів, розташованих в академічному середовищі, що дозволило б організувати внутрішні та зовнішні процеси для дослідників та студентів різних рівнів. Виявлено, що бізнес-інкубатор, який знаходиться в університетському середовищі, є ланкою в складній системі, успіх якої залежить від зовнішніх факторів, таких як макроекономічна ситуація, правова система, в якій інкубатор здійснює свою діяльність та підприємницька культура, а також від внутрішніх факторів, таких як техніко-наукові, здібності академічного (університетського) персоналу, командна діяльність, доступ до фінансових джерел та програм та ін. Методологія структуризації університетських інкубаторів та їх внутрішніх процесів є важливим фактором їх розвитку, адже дає можливість оцінювати та контролювати діяльність цих університетських інкубаторів.

**Ключові слова:** університетський інкубатор, підприємницькі студенти, стартова екосистема, взаємозв'язок між університетськими інкубаторами та підприємництвом.

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## Methodological Aspects Oriented to Structure the University Incubators

**Abstract.** Business incubators that are hosted by universities provide researchers and students from first cycle (undergraduate), second cycle (master), and third cycle (PhD) with ample opportunities for self-realization. However, these incubators primarily offer support in advising and developing new projects, such as creating competencies in research and applying new technologies, but they do not fully provide the entrepreneurial culture and leadership skills necessary for young entrepreneurs to turn ideas into reality. In this regard, it is very important to elaborate and create the structure of internal and external processes of the incubator right from the beginning. It is necessary to substantiate in detail the allocation of each element and determine the stakeholders and the type of activity, that form the model for structure and functionality of a business incubator hosted by a university. The purpose of the article is to reveal the methodological aspects oriented towards the formation of the structure and functioning of business incubators located in the academic environment which would allow the organization of internal and external processes for researchers and students of different cycles. It was found that the business incubator located within the University environment is a link within a complex system whose success depends on external factors, such as the macroeconomic situation, legal system in which the incubator carries out its activity and entrepreneurial culture, but also on internal factors, such as: technical-scientific, the abilities of the academic (university) staff, team activity, access to financial sources and programs, etc. The methodology of structuring university business incubators and their internal processes is an important factor in their development, as it provides an opportunity to evaluate and monitor the activities of these incubators.

**Keywords:** university incubator, entrepreneurial students, startup ecosystem, relationship between university incubators and entrepreneurship.

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**Introduction.** The University environment as the main character of the knowledge-based society has the mission to directly contribute to the development of the individual and the social-economic environment – all this generating knowledge through education, research and innovation. Thus, the role of the University environment is to: create competent human resources for the professional environment; generate new methods and procedures for learning / knowledge; offer institutional conditions for person to develop within this environment [1, p. 83].

The University incubator must allow the mobilization of competencies network, in order to guide concretely the owners of the selected projects, with human, material and financial resources. It is a network of academic activities to encourage and support the University employees and students in financial, technical and managerial plans to create their own enterprises, by all forms of support and guidance, to exploit commercially any innovative idea or product invention, any service or technology, developed during the University or institutions research or within collaborators [2, p. 164].

**Literature review.** A starting point in researching methodological aspects aimed at structuring, functioning and evaluating business incubators located in university environment is based on scientific work of researchers dedicated to business incubators. For a deeper knowledge of the objectives of the research, the authors' visions were examined: S. Mihaila, C. Someșan, A. Cîrlan, A. Ivanova, E. Rogova, A. Gribenchin, V. Vasilyev, A. Lipińska, N. Galiyeva, F. Paladi, N. Hassan. The development of business incubators located in university demonstrates that these structures play an important role in business development and with innovative activity focus for students, master's students and PhD students being entrepreneurs in this way contributing to the development of SMEs and economy.

**The purpose of the article** is to reveal the methodological aspects oriented towards the formation of the structure and functioning of business incubators located in the academic environment which would allow the organization of internal and external processes for researchers and students of I cycle (license), II cycle (master) and III cycle (PhD).

**Results and discussions.** The European report on science, research and innovation performance of 2018 mentions that the activity of incubators must be carried out as part of three main actors, where the University, economy and public sector strengthen each other by focusing on innovation and entrepreneurship. Similarly, the SMEs often ask the University to find solutions implying innovative processes and techniques [3].

The main reasons that determine the Universities to create business incubators are the following: increase financial resources from the revenues after patents concession or incubation of spin-offs and start-ups; develop the technology transfer and relations with the socio-economic environment; actively participate in the development of the local economy; strengthen its image to attract students, teachers, businesses [2, p. 173].

The global experience concerning the development of business incubators within the University environment demonstrates that these structures play an important role in the development of business having an innovative aspect for future young entrepreneurs. They provide support to incubated enterprises not only by providing space, but also allowing access to the network of enterprises with various types of activity, universities, business incubators and developed system of skills. The business incubators from the University environment, as network component, have a visible positive impact on the development of the economy in the innovation field, they quickly promote and / or sell new ideas and research results within universities, facilitate exchanges of new technologies, which increases the production efficiency [4, p. 21].

After analysing the available information about how the innovative infrastructure within Universities operate (Massachusetts Institute of Technology, USA; University of Cambridge, UK; University of Twente, Netherlands; University of Aalto, Finland) allowed A. Grebenchin and A. Ivanova to identify nine main areas of its activity:

- 1) Theoretical-practical studies oriented towards entrepreneurship for students, teachers and entrepreneurs themselves.
- 2) Research in the entrepreneurial environment and involve the students in them.
- 3) Provide consulting services for entrepreneurs and mentoring for start-ups (teams of “student entrepreneurs”).
- 4) Develop the networks and entrepreneurial communities.
- 5) Develop the innovative infrastructure, including science parks, business incubators, technology transfer centers, business centers, etc.
- 6) Organize conferences, contests and events on business topics, business plan, business ideas, etc.
- 7) Develop the university policy with emphasis on entrepreneurship development.
- 8) Strengthen the entrepreneurial spirit and develop the entrepreneurial culture.
- 9) Interaction/connect with the business environment, University environment, state authorities and investors.

One of the most significant elements of the University's innovation ecosystem is the education system. It should also be noted that in Western universities the students are actively involved in research and project development, during the studies aimed to entrepreneurship and business, under the guidance of academics and business trainers who form multidisciplinary teams (of students) and implement the projects based on innovation [5, p. 51].

To form entrepreneurial thinking, the Universities, in collaboration with their incubator, use “soft skills” in the study programs (cycle II, master), called also social skills based on emotional and social intelligence, which allows developing skills in four areas: Decision, Leader, Negotiation and Management. The top 10 most appreciated “soft skills” by employers (communication, social, linguistic, cognitive, emotional, listening skills and teamwork, creativity and leadership qualities) guide

us to discover what skills, besides professional ones deserve to be developed during the learning process. To solve the entire problem, the graduates have to gain a new type of “soft skills” that are to be added to the traditional skills [6, p. 54].

Therefore, the innovation in the context of the university's entrepreneurship-oriented ecosystem can be treated as an element of propulsing the start-ups and leadership initiatives; organizing the activities and evolution of programs; involving internal and external parties and new research in exploring various methods and their practical application [3].

Startups are an example of market participants playing an important role in the knowledge-based economy. They are temporary organizations searching for a scalable, repeatable and profitable business model. E. Ries defines a startup as any institution established to produce a new product or service under conditions of extreme uncertainty. Many startups are associated with the high-tech sector, which is characterized by a high degree of market and technological uncertainty and competitiveness subject to changes. Startups operate within the ecosystem which includes key resources such as knowledge, expertise, financial resources and time, and institutions presented in Figure 1.

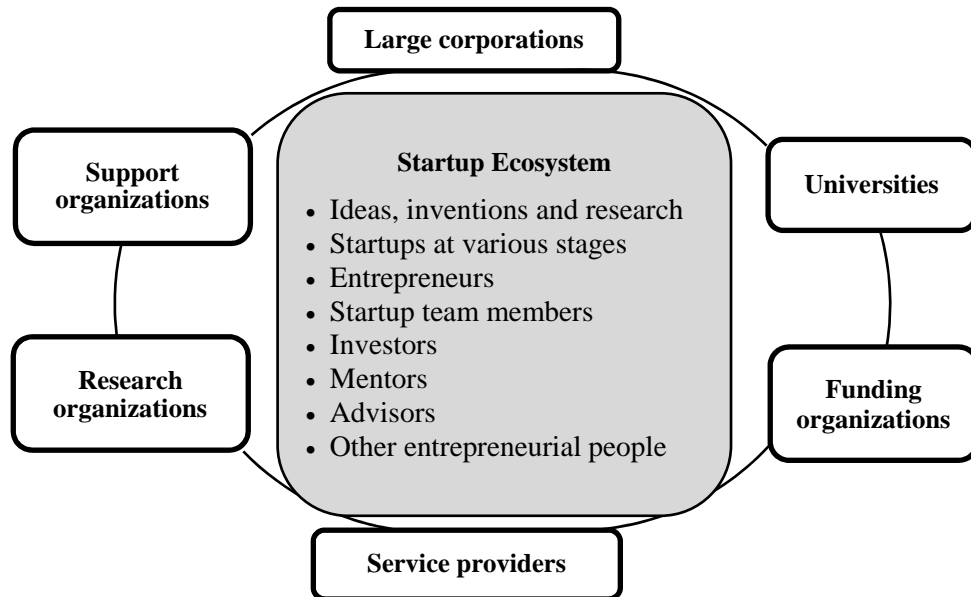


Figure 1. Elements of startup ecosystem

Source: 7, p. 427.

Currently, there is a need to create an integrated model of developed (innovative) SMEs in the University environment, where the team of “entrepreneurial students” and scientists (researchers) from the University work together. The team of “student entrepreneurs” develops a project (presenting its business plan) for the University infrastructure, actively participates in investments-based competitions and receives financial support to implement the business idea, which will lead to launch the enterprise [5, p. 49].

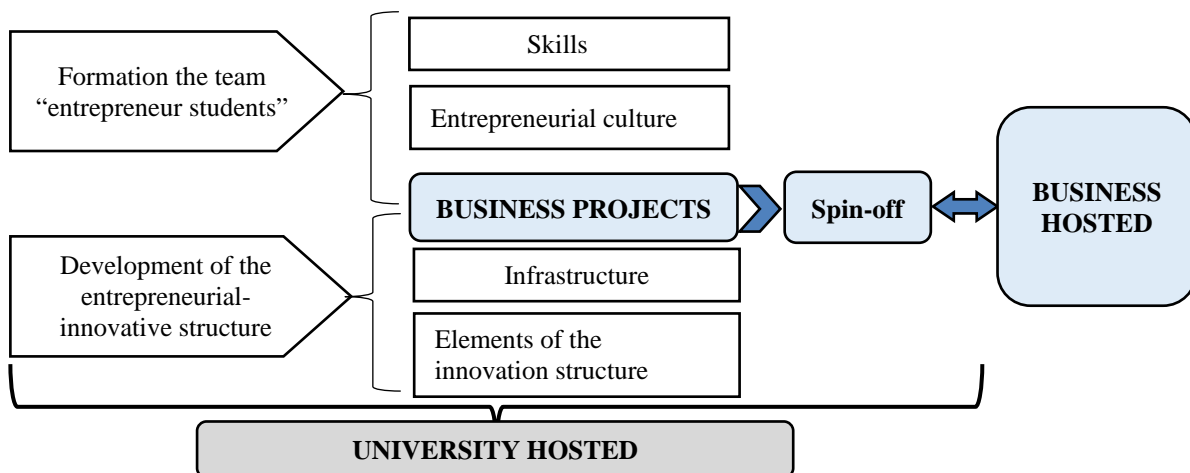


Figure 2. Integrated model for SME development at the university

Source: completed by the author according to the [5, p.50].

Often, the relationship between Universities and business incubators is complicated, because the universities are not always interested in promoting their spin-off companies through University incubators, and business incubators are not open to take or receive them within this environment.

However, there is no detailed information about the listed funds to develop the University incubators, about the survival of businesses within such incubators and indicators to calculate their efficiency. So the following questions arise: 1) What indicators would evaluate the effectiveness of the business incubators within the University environment? 2) What are the advantages for Universities of a spin-off established in the business incubator? 3) Do they contribute to technology transfer? 4) What are the main barriers that restrict the development of University incubators as elements of the technology transfer system of Universities? 5) What is the cause of blockage of interactive processes between students of all cycles and the academic staff? 6) What are the factors that positively and negatively influence the successful activity of the University incubators? [8, p. 55].

According to the UK Business Incubation, there is no a single model for the business incubation environment to function and being structured. Each of them reflects a unique combination of internal and external factors. Such diversity (and complexity) arises the problem to develop a model (template) for comparative analysis of the business incubation environments, both in terms of used indicators (qualitative indicators, quantitative indicators) and, in terms of methodology (which must also include how the data is collected).

In its turn:

*Pre-incubation* – includes activities aimed to support potential entrepreneurs in developing business ideas, business models and business plans. The aim is to increase the chances of young entrepreneurs to be able to set up a business effectively, as well as to successfully move to the

actual stage of starting it. The services that are provided, as a rule, at this stage consist of a first evaluation of the business idea and an individual guidance on all aspects related to prepare the business plan.

*Incubation* – begins when the company is actually established and ends when it becomes autonomous and ready to operate independently on the free market. At this stage, the incubator provides access to financing, training and guidance for entrepreneurs, as well as to networks of potential technological and commercial partners, office space and, in some cases, access to fully equipped laboratories, workshops and work installations for prototypes production. The physical incubation (companies are physically present within the incubator) is important in certain economic sectors (e.g. biotechnology and advanced materials sector). However, in some sectors (for example, in the field of software development services), virtual incubation can also be an effective solution.

*Post-incubation* – includes the activities carried out when the company becomes financially and operationally independent and it is able to continue its operations without external support. The company may need various services, such as measures to increase its sales, improve the production processes through methods such as internationalization or introduce innovative products / services [9, p. 9].

We emphasize that the basic pillars such as: the model of the incubation process and the services offered by them are the basis for any business incubators to be created and activate successfully regardless the environment where they are located.

In his work “University business incubators as a tool to accelerate the entrepreneurship” Noha Ahmed Hassan developed the scheme by which he presented the relationship between the University incubators and entrepreneurship, where he emphasized the main elements of inputs and outputs:

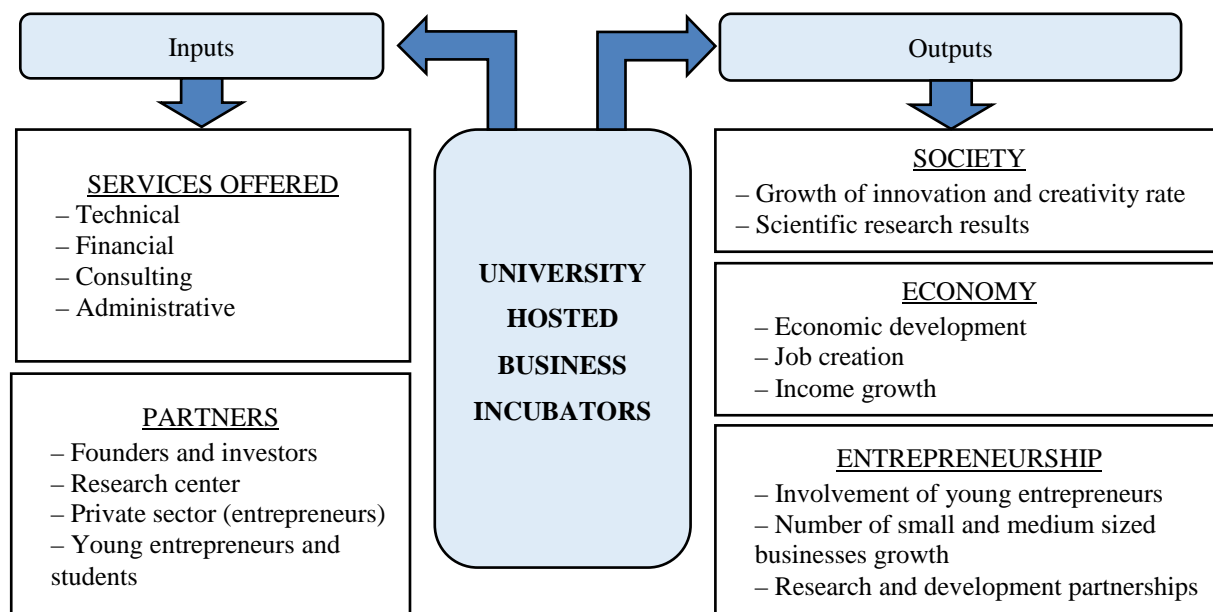


Figure 3. Relationship between university incubators and entrepreneurship

Source: adapted by the author [3].

It is important for academia members to cooperate, support and work within the University incubators, because the students are willing to start their own business. Therefore, the service provided by academic business incubators set up by the Universities can be a decisive factor for young people to study at a particular University, also the opportunity to implement business idea and to accumulate entrepreneurial skills and abilities and others.

The development of an information system that would have a database with a detailed analysis and which is oriented to obtain efficiency indicators of the business incubators from the academic (university) environment, must start from the detailed understanding of the components of this research-oriented system [10, p. 80].

Currently, in the Republic of Moldova, the connection between research, education and business environment is very distant. The mobilization of Universities with regard to innovation must involve transformation and orientation towards European good practice [11, p. 31-35].

According to the research conducted on incubators located within the University environment in the Republic of Moldova and managed by the Agency for Innovation and Technology Transfer (AITT), they promote and support small and medium enterprises to create innovative products and services.

Stimulate young entrepreneurs, facilitate the dialogue between inventors, researchers, government representatives and business environment by the AITT are important elements in the activity of University incubators, but the creation of these incubators has to be based on three pillars – methodology oriented to *structure, operation* and *evaluation* of University incubators.

The proposed methodology aimed at forming the structure, operation and evaluation components of the business incubators located within the University environment and it includes the following evaluation techniques, tools and steps:

1) Presentation of the model of a functional and structured incubation environment within the University, reflecting the internal and external factors.

2) Development of a questionnaire to evaluate the results of gained abilities and competences within the entrepreneurial education. The questionnaire is intended for students, master students, doctoral-students.

3) Development of the questionnaire to argue the necessity of the University incubator activity within the entrepreneurial education to form abilities and competences of the future entrepreneurs. The questionnaire is intended for academic (professors) involved in the educational process.

4) Development of the system of indicators regarding the evaluation and monitoring of the business incubator located in the university environment.

**Conclusions.** In the university, there is relatively little empirical research that examines the impact of business incubation on the business development, but when we look at developing countries, such as the Republic of Moldova, there is a lack of research on this subject [12, p. 48]. At the same time, in order to develop the technological transfer in the Republic of Moldova, efforts are being made to organize and operate science and technology parks and innovation incubators, based on the Law on Science and Technology Parks and Innovation Incubators; as well as the Partnership Agreements signed annually between the Government of the Republic of Moldova and the Academy of Sciences of the Republic of Moldova. In order to facilitate the development of innovation and transfer processes, successful higher education institutions support and promote the idea to develop the business incubators, including innovation, within Universities [11, p. 49]. A business incubator located within the University environment is a link within a complex system whose success depends on external factors, such as the macroeconomic situation, legal system in which the incubator carries out its activity and entrepreneurial culture, but also on internal factors, such as: technical-scientific, the abilities of the academic (university) staff, team activity, access to financial sources and programs, etc. It is also important to mention that the methodology applied within the University incubators is a very important factor both in forming the structure, the functioning of the inside processes, and the possibility to evaluate and monitor the activity of these University incubators. In order to improve the Universities efficiency in developing the incubators within the University environment, it is necessary to redirect interdisciplinary the activity on projects, involving the students of all cycles in the research and use of the application element.

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