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Managing the Process of Creating the University's Student Ecosystem

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ABSTRACTS

The subject of the article is the methodological aspects of managing the process of creating the University's student ecosystem. The object of the article is the university's student ecosystem. the purpose of the work is to increase the efficiency of the process of creating the university's student ecosystem. To achieve this goal, the following tasks are solved: descriptions of the essence and content of the university's student ecosystem, the formation of a conceptual approach to designing the university's student ecosystem, the adaptation of the ergo design method in the interest of its use in the creation of the university's student ecosystem, discussion on the organizational culture of the university's student ecosystem, suggestion, and discussion on criteria for evaluating the effectiveness of the university's student ecosystem. This also studies the risks of creating a university's student ecosystem. Scientific methods in the article are ecosystem approach, historical analysis, system synthesis and analysis, methodology of ergonomic design, eco-system approach, and forecasting. The scientific novelty of the article is determined by the formation of methodological foundations for the creation of student systems at universities.

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1. INTRODUCTION

The relevant topic of the article is related to the need to improve the quality of higher education at universities in the context of the transition to a new technological order. In the period of the new 10th technological trend (2010-2040), new forms of doing business can be considered: the formation of clusters, the creation of technological platforms, and the synthesis of anthropogenic ecosystems. The creation of student ecosystems in universities can be considered one of the directions for improving the quality of higher education.

The hypothesis of the article is the statement that the creation of student ecosystems in universities can improve the quality of higher education and the effectiveness of the development processes of national economies. The work aims to increase the efficiency of the process of creating a student ecosystem of the university. To achieve this goal, the following tasks are solved:

(i) Descriptions of the essence, structure, and content of the elements of the university's student ecosystem,
(ii) Formation of a conceptual approach in the design of the university's student ecosystem,
(iii) The organizational culture of the university's student ecosystem is discussed,
(iv) Proposed and discussed criteria for evaluating the effectiveness and risks of building the university's student ecosystem.

The object of the article is the student ecosystem of the university. The subject of the article is the methodological aspects of managing the process of creating the University's student ecosystem. Scientists express the point of view that the process of forming a new technological way can be considered an opportunity to get out of the crisis associated with the previous technological way (Kosakyan, 2022). The formation of a new technological order requires changes not only in the field of technology but also in the humanitarian field. The change of technological patterns in the economy requires changes in the training programs of students. To increase the efficiency of the processes of transition of economic sectors to a new technological order, the theory of technological ways was developed (Glushchenko, 2021). The development of an ecosystem approach is considered one of the promising areas of development of universities. Researchers study the essence of ecosystems and their types (Borovik & Doroshenko, 2020). Scientists study the theories, similarities, and differences of different types of ecosystems (Fadeikina & Malina, 2021).

It was proved that the methodology of ergo design can be used to improve the efficiency of ecosystems (Glushchenko, 2022a). The theoretical foundations of the ergo design methodology were set out in such works. The concept of lean production in higher education may be of great importance in the period of a new technological order (Glushchenko & Glushchenko, 2017a).

Increasing the motivation of students is considered a tool for improving the quality of higher education at universities. Therefore, they study the dynamics of the professional motivation of students. To increase the motivation of university students, a student motivation policy can be applied. In addition, to improve the quality of higher education, the level of customer orientation of the university is important. To improve the quality of higher education, higher education quality management and quality assessment of such education are used (Tambovtsev & Rozhdestvenskaya, 2020). In the conditions of the formation of a new technological order, new methods of innovation activity are emerging. For example, the methodology of design thinking is developing. The method of design thinking increases the efficiency of innovative project management (Pulyavina, 2021).

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At the beginning of the 21st century, SMART technologies are used to improve management efficiency. The conclusion based on the results of the study of publications on the topic of this article may be that the analysis of these publications did not reveal articles dedicated to the creation of student ecosystems in universities. This may indicate the relevance and scientific novelty of this article (Glushchenko & Glushchenko, 2017b).

2. METHODS

This paper is a literature survey. Data were obtained from an internet source, including articles from international journals. Data were then compiled, explained, and compared with discussion based on realistic conditions.

3. RESULTS AND DISCUSSION

The management system of the process of creating a university student ecosystem can be presented in two versions. With the first approach, the following functions can be distinguished in such a management system: goal-setting, which includes defining the goals of creating both this entire system and its subsystems, marketing of management methods, which consists in creating new methods and choosing the best (optimal) management methods, the management function of this process, which consists in maintaining balance in a triangle "people-goals-resources" in the process of creating such an ecosystem.

With another approach, in the process of managing the creation of such an ecosystem, the following functions can be distinguished:

(i) The planning function, which consists of the development of various types of plans,
(ii) The function of the organization, which will be involved in the creation of project groups for individual services,
(iii) The motivation function, which will be aimed at creating such conditions when project groups will strive to achieve their goals,
(iv) The control function consists in the fact that in the management process it is necessary to confirm the achievement of the goals of creating such an ecosystem or to establish the fact of non-achievement of these goals.

The structure of the student ecosystem includes a number of IT services. These information services are integrated into a single structure called the university's student ecosystem. Such an ecosystem should have its own corporate identity, which includes: brand, slogan, corporate colour, and more. Separate project groups are being created to develop these services.

The creation of this ecosystem is aimed at improving the comprehensive service of students in extracurricular activities. It is assumed that this can improve the quality of higher education at the university. The system analysis allows us to conclude that during the transition to a new technological order, not only the technologies of production activity change. In close connection with technological changes, changes are also taking place in the following areas: credit and monetary relations, forms of doing business, management methods, forms of scientific and innovative activities, and types of educational activities. These changes in social and professional institutions are determined by the fact that to ensure the effective functioning of new technologies, new social and professional institutions should be created (Glushchenko, 2021). Thus, at the beginning of the 21st century, the main trends of changes in the higher education system can be called: the development of distance education, the use of the project method in educational activities, increasing the level of customer orientation of universities, expansion of the use of lean production methodology in

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educational activities, increasing the level of motivation of students in the learning process, expanding the practice of tutoring and mentoring, formation of ecosystems in the field of higher education and more (Escomes & Morbo, 2021).

Sometimes the initiators of innovations are the students themselves. There are facts when innovations in the student environment become global and have civilizational consequences. For example, it is a well-known fact that student innovation in the field of personal communications of students on the university campus has transformed into a global Facebook network.

In the context of the formation of a new technological order, ecosystems in the field of education are emerging (Nuhu & Onojah, 2022). The entire higher education system and its elements can take the form of specialized ecosystems. The student ecosystem of the University (SEU) will be called a set of IT services aimed at increasing creative potential and improving the level of education as well as the comfort of students' lives within the educational process at the university. It should be emphasized that the creation of the university's student ecosystem covers processes beyond the student's classroom work. The university's student ecosystem does not directly affect the educational process at the university.

The essence of the university's student ecosystem can explain its functions and roles in the educational process and students' lives. The functions of the university's student ecosystem can be called:

(i) Reducing the time and energy spent on searching for educational literature and other educational content in the process of independent work of students,
(ii) Increasing the level of student involvement in the organization of a student's life outside of the classroom learning process,
(iii) Development of participatory management of students' life processes,
(iv) Reduction of unproductive waste of time and energy of students in solving their everyday problems,
(v) Development of the activity component in the process of teaching students at the university,
(vi) Improving the efficiency and comfort of students in the process of their rest from classes,
(vii) Expansion of business and personal communications of students during their studies at the university,
(viii) Improving the moral and psychological atmosphere and the level of mutual support in the student environment,
(ix) Development of innovative organizational culture in the student environment of the university and more.

The roles of creating a student ecosystem of the university can be called: improving the quality of higher education, increasing the involvement of students in the independent educational process, increasing the level of comfort of living and social conditions of students, and more.

The paradigm of the development of the student ecosystem of the university will be called a systematic combination of such elements of its development as philosophy, ideology, politics, organizational culture, mission, goals, and vision of the development of this ecosystem (Cruz *et al.,* 2022). The practical necessity of forming such a paradigm is determined by the desire to harmonize these elements of the paradigm with each other. The process of forming a development paradigm (in this case, the university's student ecosystem) can be considered as the application of a SMART approach in the process of creating this

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system. Such self-management of the development process of the university's student ecosystem, in particular, involves checking the goals of creating this ecosystem for its compliance with such requirements (Specific, Measurable, Achievable, Relevant, and Timely).

The philosophy of creating a student ecosystem of the university will be called the wisest and most general view of the process and results of the development of the student ecosystem at the university. Based on the philosophy of creating a student ecosystem, the principles, culture, ideology, and policy for developing such an ecosystem at the university are formed.

The philosophy of the development of the university's student ecosystem should form and reflect the mechanism of influence of this ecosystem in the following areas: improving the quality of education at the university, the growth of the activity part in the university training of students, increasing the degree of comfort of living conditions of students, improving the quality of labour resources, increasing the creative potential of labour resources, the development of business and personal communications of students, improving the moral and psychological environment, etc (Boldyreva & Maksimova, 2018; Manghano *et al.,* 2022).

Under the mechanism of influence of the university's student ecosystem on the quality of labour resources in the national and global economy, we will understand a system of methods and forms using which this system can influence individual characteristics of students' lives and the quality of the university's workforce as a whole. At the same time, the services included in the student ecosystem of the university should be aimed at optimizing the actions of students during extracurricular time and the performance of everyday activities. The basis of the philosophy of the development of the university's student ecosystem can be considered a logical chain that reflects the impact of reducing unproductive losses of students' efforts and time during their studies at the university and living on the university campus.

Therefore, a significant place in the philosophy of building the university's student ecosystem should be occupied by the idea aimed at reducing the unproductive waste of student's time in the educational process (for example, searching for the necessary information) and in everyday life (for example, the time of searching for the right audience or the university campus building). The university's student ecosystem needs to be designed. The project of the student ecosystem is an image of the future of this ecosystem.

The image of the student ecosystem includes the main characteristics and a description of the structure of this ecosystem. The philosophy of designing and creating the student ecosystem of the university can be considered the following principles:

(i) The main motive for the creation of services included in the student eco-system of the university can be considered to improve the quality of education and quality of life of students, the development of creative abilities of students,

(ii) The university's student ecosystem is created by students for the students themselves, based on the study of students' problems and needs,

(iii) During the project of creating a student ecosystem of the university, students use advanced its technologies and the results of their studies at the university,

(iv) In the process of creating the university's student ecosystem, a post-industrial approach is applied, which means actively using the achievements of science to create new needs for students,

(v) The basis for the creation of the university's student ecosystem can be considered the active participation of students themselves in improving the extracurricular educational process and the life of students,

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(vi) The basis for the creation of the university's student ecosystem is the personal and group initiative of students,
(vii) The collective and individual promotion of ideas to improve the quality of education and the comfort of students' lives is encouraged,
(viii) The principle of self-organization and horizontal communication of students in the process of their participation in the creation of the university's student ecosystem,
(ix) Voluntary participation of students in the creation of the university's student ecosystem,
(x) Respect for copyright and other rights of participants in the process of creating the university's student ecosystem,
(xi) The principle of freedom of creativity and self-realization of participants in the process of creating a student ecosystem of the university and more.

These principles of creating a student ecosystem of the university can simultaneously be considered the values of the organizational culture of the named eco-system. At the same time, as is known, organizational culture is understood as a set of principles and beliefs of participants in the process of creating such an ecosystem, a set of norms of behaviour that determine the response of the organization (this eco-system) to problems arising in the process of development, the relationship of stakeholders with participants in the process of creating a university student ecosystem (Samson & Angboola, 2022). The values of organizational culture usually include everything that contributes to the development and efficiency of the university's student ecosystem.

The ideology of the development of the university's student ecosystem can be considered:
(i) The main idea of creating such a system (improving the quality of higher education with the active participation of students themselves in this process),
(ii) The method of distribution of power in the process of creating a university student ecosystem (reliance on leadership and personal power (expert power, charisma, the right to power, etc.)) of participants in the process of creating this ecosystem.

The policy of creating a student ecosystem of the university can be considered a set of measures aimed at achieving the goals of the process of creating such an ecosystem. At the same time, the policy of creating a student ecosystem of the university is divided into the strategy and tactics of this process (Lumbu-ani *et al.,* 2021). The development strategy of the university's student ecosystem provides long-term results in creating such a system. The tactics of creation ensure the solution of current problems and the sustainability of the process of creating the student ecosystem of the university.

The basis for determining the appearance of the university's student ecosystem can be the concept of the named ecosystem. Under the concept of creating a university student ecosystem, we will understand a systematic view of the following aspects of its development: the appearance of this ecosystem (characteristics and structure of the ecosystem), the place and role of the university student ecosystem in the student's life, the role of the university student ecosystem in the process of improving the quality of higher education. The university's student ecosystem includes services that can be focused on obtaining such effects: an increase in the activity component in the process of teaching students, an increase in the efficiency of students' life during extracurricular time, a reduction in time loss during extracurricular life, and others. Through the mission of the university's student ecosystem, we will understand the description of the significance of the development of such systems for society as a whole. The mission of the university's student ecosystem can be considered to increase the efficiency of public production based on improving the quality of higher

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education at the university by reducing the loss of students' time and increasing the level of comfort of the educational process.

The vision of the development of the university's student ecosystem can be called an inspiring scenario for the development of this system at the university. The development video should show how the university's student ecosystem will move from its current state to its prospective state. The vision of the development of the university's student ecosystem can take the form of a scenario for the development of this ecosystem.

The goal of creating a student ecosystem of the university will be to improve the quality of higher education by intensifying many factors, including out-of-class educational activities of students. To clarify the structure of the goal elements of the university's student ecosystem, a graph can be a formed-a tree of the goals of this ecosystem, which reflects the interrelationships of the goals of this system at various hierarchical levels. The method of constructing a graph tree of goals is known.

The mechanism of influence of the university's student ecosystem on the quality of education at the university is a system of methods and forms through which this ecosystem can have an impact on the level of education at the university. The factors that influence the university's student ecosystem on improving the quality of education at the university can be called: the development of an activity approach in the education of students (services are made by students and for students), the development of business and personal communications between students in the process of creating and functioning of the university's student ecosystem, reducing the unproductive time and effort of students in the process of their extracurricular activities, raising students' awareness of the opportunities they have to take advantage of the support of the university or from the student eco-system of the university, improving professional orientation and assistance in the employment of students during and after their studies, and more. It is assumed that the intensification of the impact of these factors will lead to an increase in the quality of higher education, which in turn will generate an increase in the efficiency of social production.

The structure of the university's student ecosystem is called the totality of its elements and the connections between them. The structure of the university's student ecosystem may include elements that generate factors of influence this system on the quality of education. It can be such IT services:

(i) Service for the development of personal communications and mutual assistance between students during their course of study in extracurricular work (may include video lectures of students, information exchange related to the study of books and scientific articles, etc.),
(ii) Service for additional professional orientation of students and assistance in finding employment, taking into account the stage of study at the university,
(iii) A service to minimize the student's search time for classrooms, premises on campus, a canteen, a laundry, a barber shop, etc.,
(iv) A service to help students optimize students spending on clothing and the formation of their style in clothing,
(v) Service for the development of general (museum, art, etc.) And musical culture of students, including musical self-realization of students in various kinds of music, theater studios, and clubs,
(vi) Service for the selection of companies for internship and employment during training and/or after graduation,
(vii) Service for fitness, sports sections, travel, and more.

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When creating student ecosystems at universities, design thinking and ergo design can be used. Design thinking can be considered a promising way of innovation and ergo design in the field of higher education (Pulyavina, 2021).

4. DISCUSSION

Since the university's student ecosystem is a complex system, conflicts and disharmony may arise between its hierarchical levels and elements. To eliminate such disharmony between the organizational conditions of the development of various elements of the university's student eco-system, it is recommended to use the ergo design method.

Ergonomic design when creating a student ecosystem of the university can be used to solve the following tasks: creating harmonious services (a set of elements), ensuring the perception of stakeholders of a set of elements of such an ecosystem as a whole, harmonization of relations between the elements of the internal environment of this ecosystem, harmonization of relations between the student ecosystem of the university and its external environment (university, employers, students, etc.).

A characteristic feature of the university's student ecosystem is that they comprehensively provide a safe and comfortable life for students during the extracurricular time. The activity of the university's student ecosystem must meet the following requirements: the safety of students' life activities during extracurricular hours, the sustainability of the development of this ecosystem, a high degree of completeness of meeting the needs of university students, minimizing damage to the surrounding environment, timely restoration of the environment in case of damage to the external environment, most fully meet the conflicting needs of stakeholders with taking into account the possible inconsistency of these requirements of stakeholders.

The characteristic features of the university's student ecosystem include comprehensive service to the social needs of university students, the desire to avoid competition between universities by creating an original system of comprehensive service to the social needs of students, reliance on the traditional way of life of university students, orientation for the entire period of student study at the university, consideration of opinions and interests of residents of the home region, taking into account the opinions of business, etc.

In 2022, the development of university student ecosystems can be viewed as a new, complementary to the main paradigm of higher education quality management. In the process of modernization of technological universities, the traditional ways of life of all categories of stakeholders of this university should be taken into account. Such a paradigm should be based on the interests, needs, and habits of various categories of stakeholders (business, students, teachers, etc.) of the university. The methodology of creating university student ecosystems can be called anthropogenic ecosystem engineering. Such ecosystem engineering can be defined as a new field of knowledge. This field of knowledge harmoniously combines knowledge from various fields of science and practice in the interest of effectively solving the problems of creating students and other types of anthropogenic ecosystems. Scientific methods of anthropogenic ecosystem engineering include the theory of organizations, theory of behaviour, economics, marketing of places (universities), design thinking, ergo design, and other areas of modern science (Purnomo *et al.,* 2022).

The stages of creating student ecosystems of universities can be known as pre-project research (advanced project), development of a project of a certain student ecosystem of the university, practical implementation of the project of the student ecosystem of the university, observation, and analysis of the effectiveness of such an ecosystem. Under the ergo designer

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design of the university's student ecosystem, we will understand the process of creating a project of such a student ecosystem based on the active use of the ergo design methodology.

Ergonomic design at the stage of synthesis of the image of the student ecosystem can solve the following problems: identifying the factors of structuring such an ecosystem, optimizing the appearance of subsystems of the student ecosystem, and harmonizing the relationships between various elements of this ecosystem. Ergo design of the organizational culture of university student ecosystems can solve the following tasks: optimization of elements of organizational culture, and harmonization of relations between elements of organizational culture of ecosystems.

Under the effectiveness of student ecosystems of universities, we agree to understand the ability of this ecosystem to achieve the goals set for them, provided that this ecosystem fulfils certain restrictions. These may be restrictions, on the number of resources available to them, for the duration of the implementation of certain socio-economic processes.

The use of the methodology of ergonomic design in the design of such university student ecosystems can: increase the efficiency of such ecosystems, create a synergetic effect in the functioning of such systems due to the more effective interaction of elements of such ecosystems. The level of efficiency of university student ecosystems can be assessed using criteria for evaluating the effectiveness of the functioning of such ecosystems (Ihechu, *et al.,* 2023). The criterion for evaluating the effectiveness of university student ecosystems can be understood as the rule of choosing the best option for such an ecosystem from many alternative options for such an ecosystem. The criterion for evaluating the effectiveness of the student ecosystem of the university ecosystem can be synthesized using the performance indicators of such an ecosystem. An indicator of the effectiveness of the university's student ecosystem can be called the most important indicator of such an ecosystem, reflecting its purpose and main characteristics.

As indicators of the effectiveness of the functioning of the university's student ecosystem, one can name the growth in the number of university students, the level of competition between university applicants, the growth in the quality of higher education, the growth in the income level of a university graduate, the degree of satisfaction of university graduates, the happiness index of university students, the degree of satisfaction of business with the quality of education and more (Al-Momani & Rababa, 2022). The main tasks of ergonomic design at the stage of formation of sets of criteria for evaluating the effectiveness of university student ecosystems include the identification of the most important indicators of the functioning of such an ecosystem, optimization of a set of parameters of the effectiveness of the university student ecosystem, and more.

The risk in creating university student ecosystems is the possibility of negative deviations in the functioning of such anthropogenic ecosystems. The risks in creating a university student ecosystem may consist of the following: incorrect definition of the mission and objectives of such an ecosystem, incorrect definition of the structure of such an ecosystem, incorrect definition of the desirable characteristics of such an ecosystem, lack of resources for the development of such an ecosystem, etc.

The tasks of ergonomic design in the study of the risks of creating a student ecosystem of the university can be considered the following: analysis of the significance of individual risks, taking into account the operating conditions of this ecosystem, ranking the risks of such an ecosystem by the importance of their consequences and/ or the rate of occurrence of consequences, optimization of risk management methods in the student ecosystem, and more.

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The originality of the university's student ecosystem is based on the following factors: competitive advantages of the university in the higher education system, competitive disadvantages of the university, the market position of the university in the national and global educational services markets, the level of customer orientation of the university, specialization of the basic partners and employers for university graduates, an organizational culture of the university and its student environment, and more. In this paper, the provisions of the works are developed (Glushchenko, 2022b; Abulude *et al.*, 2022).

5. CONCLUSION

The article discusses the relevance of the creation and development of the university's student ecosystem, it is proved that the creation of such an ecosystem can improve the quality of higher education. In turn, the growth in the quality of higher education leads to an increase in the pace of development of the national economy. The article shows that when creating a student ecosystem, the method of design thinking and ergonomic design can be applied. The paper proposes the concept of a "university student ecosystem", describes its philosophy, ideology, the policy of creation, mission, and vision of the development of this ecosystem, and discusses the structure of the university student ecosystem. The paper substantiates the tasks of ergonomic design in the process of creating anthropogenic ecosystems. A set of indicators for evaluating the effectiveness of university student ecosystems is proposed. The risks of creating a student ecosystem of the university are described. The results of this article can be used in the design and creation of university student ecosystems. The development of university student ecosystems can be recognized as one of the promising areas for improving the quality of higher education at the university and the higher education system as a whole.

6. AUTHORS' NOTE

The authors declare that there is no conflict of interest regarding the publication of this article. Authors confirmed that the paper was free of plagiarism.

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