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บทบรรณาธิการ

วารสารวิชาการผลประโยชน์แห่งชาติฉบับที่ 14 จัดทำระหว่างขึ้นในช่วงหลังปีใหม่ขออำนวยพรให้ผู้เขียนและผู้อ่านทุกท่านมีสุขภาพที่แข็งแรงมีขวัญกำลังใจที่พร้อมรับกับการเปลี่ยนแปลงภูมิรัฐศาสตร์ของโลกที่ไม่เหมือนเดิมโลกที่แบ่งเป็นสองขั้วอย่างเห็นได้ชัดระหว่างโลกาภิวัฒน์เหนือและโลกาภิวัฒน์ใต้ที่ค้นหาเส้นทางการพัฒนาที่ประกันความเป็นอยู่ของตนเองในมุมมองที่แตกต่างกันอย่างการค้ากับประเทศที่เป็นมิตรและไม่เป็นมิตร ห่วงโซ่อุปทานของตนในภูมิภาครวมถึงโซนอิทธิพลของแต่ละฝ่ายซึ่งน่าจะดำเนินต่อไปอย่างไม่หวนกลับ ส่งผลให้ยุโรปประสบปัญหามากที่สุดถึงตอนนี้โดยเฉพาะเกษตรกรที่รัฐไม่สามารถแสวงหาทรัพยากรราคาถูกได้เหมือนก่อนหน้านี้

สำหรับเป้าหมายของวารสารวิชาการผลประโยชน์แห่งชาติในฉบับนี้ เป็นผลงานของศาสตราจารย์ชาวยูเครน3ท่าน บทความที่หนึ่งเป็นบทความที่ศึกษาการจัดการอุตสาหกรรม 5.0 เพื่อพัฒนาโครงการเพื่อเพิ่มประสิทธิภาพภายใต้เงื่อนไขของอุตสาหกรรม 5.0 ซึ่งเป็นผลงานที่ยังไม่เคยเผยแพร่และเป็นงานต้นฉบับของผู้เขียนที่นำเสนออันเป็นประโยชน์ต่อภาคอุตสาหกรรมสมัยใหม่อย่างการปรับปรุงคุณภาพของการฝึกอบรมวิชาชีพ การปรับปรุงสถานะทางการเงินขององค์กรและการปรับปรุงสถานการณ์ผลิตขององค์กร บทความที่สองนำเสนอการติดตามการพัฒนากิจกรรมผู้ประกอบการร่วมกับสถาบันอุดมศึกษาของยูเครนในขอบเขตการร่วมมือทางวิชาการและธุรกิจเพื่อพัฒนาการเติบโตของภาคธุรกิจโดยอิงตามจำนวนแหล่งเงินทุนที่ให้การสนับสนุน ผู้เขียนได้ศึกษาเชิงประสบการณ์จากฐานข้อมูลในช่วงปี 2018-2020ให้คำตอบที่น่าสนใจอย่างมากสำหรับสถาบันการศึกษาที่กำหนดตำแหน่งและฐานะของตนเองในการสร้างจุดเติบโตของตนเองในพื้นที่ อีกบทความหนึ่งศึกษาโดยศาสตราจารย์สาขาเศรษฐศาสตร์นำเสนอการเปลี่ยนผ่านสู่ดิจิทัลในมุมมองปรากฏการณ์ทางสังคมและวัฒนธรรมการสะท้อนเชิงปรัชญา กระบวนการของการจำลองเสมือนและระบบอัตโนมัติ การใช้คอมพิวเตอร์และการทำให้ออนไลน์ การแปลงเป็นดิจิทัลและการใช้หุ่นยนต์เป็นกระบวนการเดียวโดยในบทความนำเสนอการเปลี่ยนแปลงทางดิจิทัลจะต้องได้รับการศึกษาในแง่ของวัฒนธรรมข้อมูลส่วนบุคคล รวมถึงวัฒนธรรมคอมพิวเตอร์ ความงามของข้อมูล และวัฒนธรรมการสื่อสารเสมือนจริง การทำให้เป็นดิจิทัลซึ่งเป็นเทคโนโลยีการนำเสนอรูปแบบใหม่จะกำหนดรูปแบบสุนทรียภาพของมนุษย์ในไม่ช้า เครือข่ายโซเชียลและบล็อกถือเป็นสิ่งประดิษฐ์ทางวัฒนธรรมที่แพร่หลายและสำคัญที่สุดของความทันสมัย บทความสุดท้ายของรองศาสตราจารย์ชาวยูเครนนำเสนอการปรับปรุงความเป็นไปได้ในการดูดซึมความรู้ในสภาพแวดล้อมของมหาวิทยาลัยโดยใช้เทคโนโลยีและระบบการศึกษาที่ทันสมัย รากฐานสำหรับกระบวนการศึกษาเชิงนวัตกรรมคือการพัฒนาและการเผยแพร่ความสำเร็จขั้นสูงในด้านการศึกษาตลอดจนการดำเนินการตามความสำเร็จทางการศึกษาที่ได้รับในทางปฏิบัติที่มุ่งเน้นบุคคลไปใช้โดยมุ่งเป้าไปที่กิจกรรมการเรียนรู้ การพัฒนาการคิดอย่างมีวิจารณญาณกลายเป็นเงื่อนไขที่จำเป็นสำหรับความก้าวหน้าทางสังคม และเป็นแรงจูงใจในการปรับปรุงตนเองและสนับสนุนการตระหนักรู้ในตนเอง

ดังนั้นบทความในฉบับที่ 14 ที่มีจำนวนทั้งสิ้น 4 เรื่อง จึงเป็นบทความวิชาการ 2 เรื่อง และบทความวิจัย 2 เรื่อง โดยได้รับความร่วมมือจากนักวิชาการยูเครน จะเห็นได้ว่า วารสารวิชาการ

ผลประโยชน์แห่งชาติได้คัดสรรบทความนำเสนอผ่านการประเมินจากผู้ทรงคุณวุฒิที่มีประสบการณ์ในสาขาที่เชี่ยวชาญจากต่างประเทศ

บรรณาธิการขอแจ้งให้ผู้อ่านผู้เขียนบทความรับทราบว่า วารสารวิชาการผลประโยชน์ได้ดำเนินการตามจรรยาบรรณว่าด้วยการแจ้งอัตราค่าธรรมเนียมการตีพิมพ์บทความวารสารวิชาการผลประโยชน์แห่งชาติก่อนกองดำเนินการวารสารฯจะส่งบทความให้ผู้ทรงคุณวุฒิพิจารณาบทความ (Peer Reviewers) จำนวน 3 ท่าน

ผู้เขียนที่สนใจที่จะถ่ายทอดผลงานวิชาการ และผลงานวิจัยเกี่ยวกับภูมิรัฐศาสตร์ ภูมิเศรษฐศาสตร์ นวัตกรรม และเทคโนโลยี สามารถที่จะศึกษาคำแนะนำในการเขียนได้ในท้ายวารสาร ซึ่งทางเรายินดีอย่างยิ่งที่จะพิจารณาผลงานด้านนี้เนื่องจากเป็นแนวทางวิชาการที่มีความต้องการอย่างมาก และที่สำคัญมีการพัฒนาอย่างรวดเร็วจนทำให้แวดวงวิชาการปรับตัวอย่างมากในกระแสธารการเปลี่ยนแปลง โดยเฉพาะอย่างยิ่งในสถานการณ์การทหาร เศรษฐกิจแบบใหม่ อุดมการณ์ใหม่ เทคโนโลยีใหม่ทุกสาขาที่นำมาใช้ เพื่อให้เกิดการถกเถียงในทางวิชาการอย่างสร้างสรรค์และใช้ฐานข้อมูลทางวิชาการของนักวิชาการจากยุโรปตะวันออกตะวันตกโดยตรงในมุมมองที่แตกต่างกัน

รองศาสตราจารย์ ดร.ชินสัคค สุวรรณอัจฉริย
บรรณาธิการวารสารวิชาการผลประโยชน์แห่งชาติ

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บทความวิชาการ(Academic Articles)

วารสารวิชาการผลประโยชน์แห่งชาติ
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Project Performance Management in Enterprises in Industry 5.0

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ABSTRACT

The article systematizes the understanding of the development and implementation of project activities in the context of Industry 5.0. It is noted that with the development of Industry 5.0, the management of enterprise project activities becomes of paramount importance. The key driver of this process was the COVID-19 pandemic. The aim of the article is to develop a project to enhance the efficiency of project activities for enterprises in the conditions of Industry 5.0. To achieve this goal, it is proposed to identify 7 stages for improving the efficiency of project activities for enterprises. The proposal includes defining alternative goals, establishing criteria for selecting responsible project performers, conscientiously forming the project team, and comprehensively analyzing strategic and current issues. This will help identify the sources of their occurrence and factors influencing them. As a result, the strategic goal will be correctly defined, and the main directions for improving the efficiency of enterprise activities will be substantiated. To enhance the efficiency of project activities for enterprises in the conditions of Industry 5.0, a combination of three measures is proposed: improving the quality of professional training, improving the financial condition of the enterprise, and enhancing the production status of the enterprise.

KEYWORDS: project activity, Industry 5.0, Covid-19, management, sustainable development.
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1 Introduction. With the development of Industry 5.0, the issues of project management within enterprises become increasingly crucial. The relevance is heightened by the fact that Industry 5.0 emerged in Ukraine approximately two years ago. The key driver of this was the COVID-19 pandemic. In the business environment, questions arise regarding full alignment with the green course, leading to sustainability and a circular economy. Processes aimed at improving the resilience of value chains and ecosystems to new shocks (pandemics, natural disasters, wars) are also observed. The activities of most enterprises should focus on sustainability, resilience, digitization, human-centric approaches, and corporate responsibility. Currently, there is a shift in the philosophy of understanding business, where the frameworks for development are defined by competitiveness and sustainability. Industry 5.0 seeks to integrate human capabilities, advanced technologies, and environmental care. In project activities, more attention should be given to human, social, and environmental aspects. It becomes evident that to achieve the goals of Industry 5.0, it is necessary not only to commercialize innovative products and technologies but also to establish a sustainable value system. The latter undergoes transformation through effective management approaches. Therefore, the search for development prospects and revenue generation is the foundation of project activity in the modern economy. It is characterized by dynamism and uncertainty, requiring economic entities to take adaptive actions to achieve entrepreneurial goals without posing threats to societal development and the environment. The essence of project management lies in assembling a team of highly qualified professionals from various fields to execute a complex project within set deadlines, ensuring a specified level of quality and utilizing allocated material, financial, and labor resources for this purpose. Project management aims to optimize the flow of financial and monetary resources, as well as effectively address challenges that arise between economic entities during project implementation. Thus, a balance of interests among different stakeholders in Industry 5.0 is sought: government, business, and society.

2 Literature Review. The research of authors on project management becomes of paramount importance. Moreover, such studies are deepened in the context of COVID-19 and the challenges of Industry 5.0. Zadorozhna&Kepko(2021)concluded that quality assessment, by its essence, is a project activity. It exhibits all the features of a project approach. Specifically, it involves a clearly defined purpose of activity, uniqueness of the obtained result, engagement of the project team in project work, and the existence of certain constraints that determine the specifics of implementing a particular project evaluation. The authors consider that the quality assessment project algorithm consists of two parts: the development of the quality assessment methodology and its application. They equate the modern economy with the project economy.

Maistrenko(2021) noted that project management in a rapidly changing environment is a relevant technology that ensures the effective solution of a specific set of tasks within limited time frames and with minimal costs. Project management significantly improves productivity and enhances efficiency. The success of applying project management depends on its professional implementation in a specific institution and the effective organization of teamwork. It greatly enhances productivity and increases the efficiency of enterprise activities.

Obidiennova et al (2020)explored the issue of enterprise management. It is based on considering the enterprise as a set of resources that participate in achieving the set goal. On the other hand, it is viewed as a set of functions that need to be implemented to achieve the desired result. Depending on the characteristics of the enterprise's functioning, project goals, project tasks, and available resources, the following options are possible when forming a project management team: Option 1: All members of the project team are employees of the same enterprise within which the project team is created. Option 2: All members of the project team are invited experts from other enterprises and organizations. Option 3: Some experts are employees of the enterprise, and experts whose knowledge and skills require modern approaches to project task execution are invited from other enterprises and organizations. The authors consider the third option to be the most preferable as its advantages outweigh the drawbacks associated with its use.

Samoilenko(2022). identifies several optimal ways to successfully implement project activities in the enterprise. One of them is partnership, which creates social capital, improves mutual understanding, trust, and interaction among representatives of different community sectors. This is the most effective form of relations between various community institutions, helping overcome the consequences of negative changes..

Nahara(2022)researched Industry 5.0, which comprises three main elements: human-centricity, stability, and resilience. The rapid spread of Industry 5.0 technologies is driven by the formation of effective business models based on intellectualization, socialization, and ecological considerations. In the perspective of the global economic system of Industry 5.0, a new type of business models will emerge, grounded in knowledge, innovation, and information, with an orientation towards diversified values in line with sustainable development goals.

Chernenko et al. (2022) emphasize that cloud computing plays a crucial role in the further development of the Fourth Industrial Revolution in the context of the "Fifth Industry". Cloud computing consolidates, centralizes, and processes information beneficial for businesses. The Fifth Industrial Revolution will transform the business of individual enterprises and impact the redistribution of productive forces on a global scale. A characteristic feature of Industry 5.0 is a human-centric approach to the development and implementation of technologies. They enable the assessment of the level of enterprise savings in the use of natural resources, social responsibility, the level of emissions of pollutants into the external environment, the number of new jobs created, and compliance with gender equality.

Zubkova et al.(2023)note that during Industry 5.0, a system of strategic risks for enterprises is being formed. This occurs during the implementation of digitization projects. Eight classes of such risks are described: technological risks, competitiveness risks, operational risks, stakeholder relationship risks, financial risks, human resources risks, brand risks, and hybrid attack risks.

Chernikov&Gryshko(2023)pointed out that Industry 5.0 enables enterprises and industries to actively provide solutions to society for resource conservation, ensuring social stability, and addressing climate goals. However, there is a very high probability of new risks emerging that negatively impact

various aspects within organizations. Industry 4.0 and Industry 5.0 will not be able to fully realize their potential until all their risks are well understood and clearly assessed .

Polinkevych (2020) ; Polinkevych & Kolosok (2022); Polinkevych et al. (2023)noted that in Industry 5.0, socially responsible business plays a crucial role. They identify the features of business and project activities in Ukraine during the period of war and the COVID-19 pandemic.

3 Methodology. In this work, a comprehensive descriptive approach, analytical methods, synthesis, abstraction, and comparison are employed in investigating project activities of enterprises in the context of Industry 5.0. The study utilizes the method of generalization in examining the stages of development and implementation of a project aimed at improving the efficiency of enterprise project activities. Additionally, a graphical method is applied to determine cause-and-effect relationships and the "goals - measures - resources" graph of the efficiency enhancement project for enterprise project activities. The tabular method is employed to identify strategic and current issues related to improving the efficiency of enterprise project activities, listing strategic and current goals, and proposing alternative implementation options for the efficiency enhancement project for enterprise project activities.

4 Results. Conceptual approaches division into periods

The aim of the article is to develop a project aimed at improving the efficiency of project activities in the conditions of Industry 5.0.

In the context of integrating domestic enterprises into the global economic space, accompanied by intensified competition, stimulation of specific markets, and challenges in achieving technological breakthroughs, including working with current and potential customers. The identification and systematic implementation of strategies to enhance the efficiency of project activities for enterprises in the context of Industry 5.0 are essential prerequisites for improving overall business performance.

The development and implementation of a project to enhance the efficiency of project activities at the enterprise in the context of Industry 5.0 form the basis of the proposed methodological support. This project is advisable to be carried out through the following stages:

1. Formulation of the project goal: The goal should be clear, measurable, achievable, relevant, and timely.

2. Development of criteria for selecting responsible project performers: Criteria should define the necessary knowledge, skills, and experience required for the successful execution of the project.

3. Selection and appointment of responsible performers in project formation: Responsible performers should possess the necessary knowledge, skills, and experience for the successful execution of the project.

4. Identification of strategic and current issues in improving the efficiency of the project activities at the enterprise: Issues may be related to financial management, operational activities, marketing, or other aspects of enterprise operations.

5. Conducting a comprehensive analysis of strategic and current issues in improving the efficiency of project activities at the enterprise: This analysis aims to identify the sources of problems and influencing factors.

6. Definition of strategic goals and their structuring: Strategic goals should be clear and measurable, defining the desired outcome from the project's implementation.

7. Justification of the main directions for improving the efficiency of enterprise activities: The directions for improvement should be aimed at addressing identified problems, realistic, and achievable.

At the initial stage of developing a project to enhance the efficiency of project activities at the enterprise, it is necessary to define alternative goals that can be set within this project. These goals may include:

1. Maximization of consumption levels: This implies that the enterprise aims to increase the sales volume of its products.

2. Maximization of consumer satisfaction: This means that the enterprise strives to produce goods that best meet consumer needs.

3. Maximization of choice: The enterprise aims to offer consumers a wide range of goods.

4. Maximization of quality of life: The enterprise aims to ensure the availability of goods at affordable prices and high quality.

At the second stage of developing a project to enhance the efficiency of project activities at the enterprise, it is necessary to develop a list of criteria for selecting responsible project performers. The role of the project manager is of particular importance during this stage.

According to existing opinions of researchers and current project management standards, the professional skills of a project manager should encompass the following aspects:

1. Project mission structuring and task listing: the project manager must have a clear understanding of what needs to be achieved within the project. They should be able to identify the key tasks of the project and distribute them among the team members.

2. Ensuring project goals are attained within specific constraints: the project manager should be adept at planning the project, taking into account available resources and constraints. They need to coordinate the work of team members and monitor project execution.

3. Achieving comprehensive stakeholder satisfaction: the project manager should be skilled at establishing effective collaboration with all project stakeholders. They must be capable of resolving conflicts of interest among different parties.

The project team also holds significant importance. Its members should possess skills, knowledge, and experience in applying specific research methodologies, high qualifications in their respective fields, the ability to optimize resource utilization and business processes, a certain speed of project implementation, the capacity for effective innovative collaboration within a team, responsibility for task execution according to the project schedule and operational procedures, time management skills, budget control capabilities, and the ability to assess the overall progress of the project and each participant individually. The project team can be composed of representatives from legal entities as well as individuals.

When selecting responsible project performers, it is essential to consider organizations' reputation in the market of research services, the quality of provided services, direct experience and qualifications of employees, parameters of the interviewer network for conducting quantitative surveys, the availability of special software and technical tools for organizing focus groups, promoting the company's products online, and collecting relevant statistical information. Additionally, the consideration of a comprehensive approach to addressing client needs and the ability to provide additional services is crucial.

At the third stage of project development aimed at enhancing the enterprise's operational efficiency, the project team is formed. This stage involves the selection and appointment of responsible project performers.

For most enterprises in Industry 5.0, the most reasonable methods of forming a project team involve goal-oriented or problem-oriented approaches, facilitating the quickest and most effective achievement of project objectives.

At the fourth stage, the identification of strategic and current issues related to enhancing the efficiency of project activities within the enterprise takes place. This stage involves conducting a comprehensive analysis of the enterprise's operations to identify the sources of problems and influential factors.

Table 1 provides a list of strategic and current issues related to improving the efficiency of enterprise activities. While this list identifies the key problems, it does not provide a complete understanding of their essence, the reasons for their occurrence, their interrelation with others, and possible directions for their resolution. This information is available only to executives at a certain level who have access to comprehensive information about the enterprise's operations.

Table 1. *Strategic and current challenges in enhancing the efficiency of project activities in the industry 5.0 environment.*

Problem	Problem code
The enterprise lacks a clear vision of how it wan	1
There are no clear goals and directions for improving efficiency	2
There is no action plan	3
Insufficient coordination of various activities	4
Insufficient quality of project management personnel	5
Insufficient assessment of the strengths and weaknesses of the enterprise, market opportunities, and threats	6
Inadequate identification of alternative implementation options for the directions of the project activities of the enterprise	7
Absence of a methodology for assessing the effectiveness of project activities at the enterprise	8

Absence of analysis and subsequent improvement of relationships and interactions with the external environment	9
Lack of clear delineation of responsibilities among all structural units of the enterprise involved in implementing projects to enhance the efficiency of project activities	10
Imperfections in the legislation regulating issues such as demand, supply, monopoly, and export-import activities	11
The level of use of modern technologies is low	12
Insufficient level of research efficiency	13
Insufficient level of information system efficiency	14
The effectiveness level of target market segmentation is weak	15
The effectiveness level of direct sales is weak	16
The level of effectiveness in stimulating product sales is insufficient	17
Weak positions in the effectiveness of the company's product policy	18
Weak positions in the effectiveness of the company's sales policy	19
Weak positions in the effectiveness of public opinion formation	20
Weak positions in the effectiveness of advertising activities of the enterprise	21
Weak positions in the effectiveness of the enterprise's brand application	22
The company lacks a mechanism to ensure the safety and efficiency of technology use	23
Unstable state of infrastructure	24
Insufficient efficiency in implementing innovative products	25
The level of acquisition of new technologies, research, and development is low	26
The level of quality of workforce training is low	27
The level of improvement in the efficiency of project activities at the enterprise, according to an objective assessment, is low	28
The level of improvement in the efficiency of project activities at the enterprise, according to a subjective assessment, is low	29
The overall level of improvement in the efficiency of project activities at the enterprise, is low	30

Noted. Summarized by the author

To address the issues, it is essential to understand their interconnections. The identified problems may be interconnected, where one problem can be the cause of another. For instance, legislative imperfections may lead to an increase in monopolies, and monopolies, in turn, may contribute to the rise of corruption. Analyzing the interrelationships among problems will help identify primary issues and those that are consequences of others. This, in turn, aids in developing an effective problem-solving plan.

For example, if legislative imperfections are the primary issue, the priority task is amending the legislation. Once the legislation is improved, it becomes possible to address other problems that result from legislative imperfections. This is illustrated in Figure 1.

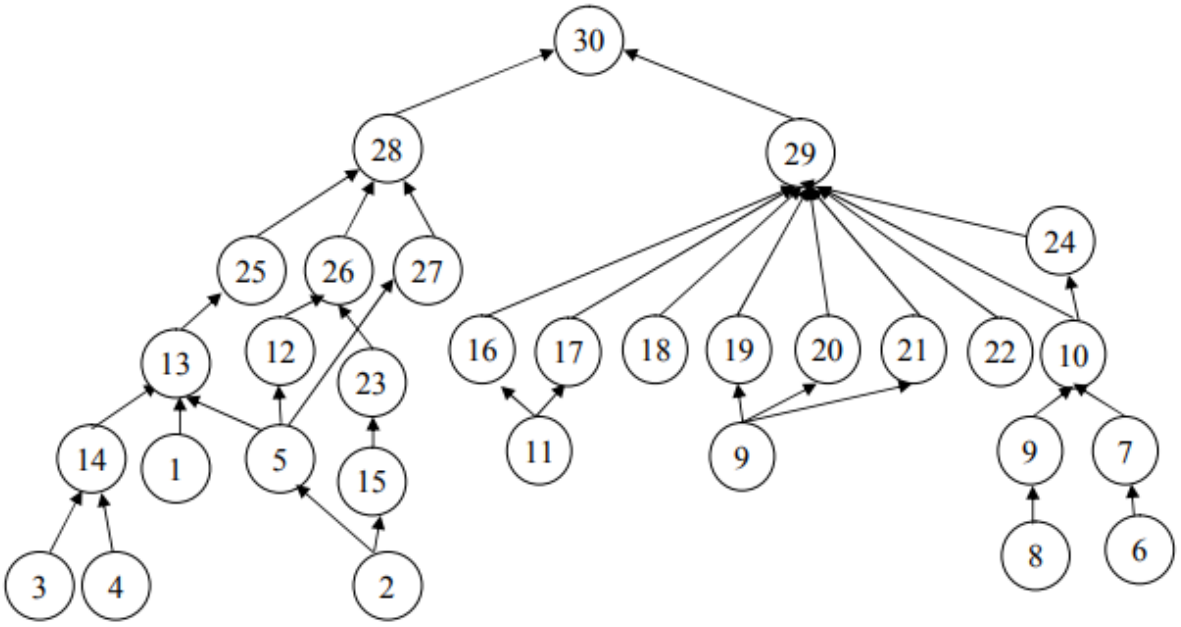

Figure 1. *Approximate graph of causal relationships*

Noted.Summarized by the author

Goals are structured from general to specific. First, a general goal is formulated, which is the basis for forming sub-goals. Sub-goals, in turn, can be broken down into smaller sub-goals. This process continues until all goals are sufficiently detailed for their implementation. It is important that each higher-level goal be represented in the form of sub-goals of the next level. This ensures the completeness of the goal structure and allows you to understand how they are interrelated. The formed list of strategic and current goals is presented in Table 2.

Table 2*. List of strategic and current goals*

trategic and current goals	Goal codes
Improving the overall effectiveness of project activities	0.1
Improving the objective effectiveness of project activities of an enterprise	1.1
Improving the subjective effectiveness of project activities of an enterprise	1.2
Improving the quality of human resources training	2.1
Improving innovative activity	2.2
Strengthening the financial condition of an enterprise	2.3
Strengthening the production condition of an enterprise	2.4
Improving the effectiveness of a company's brand	2.5
Improving the state of financial infrastructure	2.6

Improving the efficiency of using modern technologies	2.7
Forming a technology audit mechanism	2.8
Improving a enterprise's action plan	2.9
Improving the efficiency of project activities at an enterprise	2.10
Improvement of information and communication support	2.11
Improved accountability between all structural units of the enterprise that participate in the implementation of projects to improve the efficiency of the enterprise's activities	2.12

Noted.Summarized by the author

It is useful to compare goals by two criteria for goal structuring: 1) necessity: is the goal necessary to achieve the overall goal? 2) general – partial: is the goal part of the overall goal? This comparison will help: 1) identify the content of goals: understand what needs to be done to achieve the overall goal; 2) formulate goals: formulate goals in such a way that they are understandable, achievable and realistic (Fig. 2).

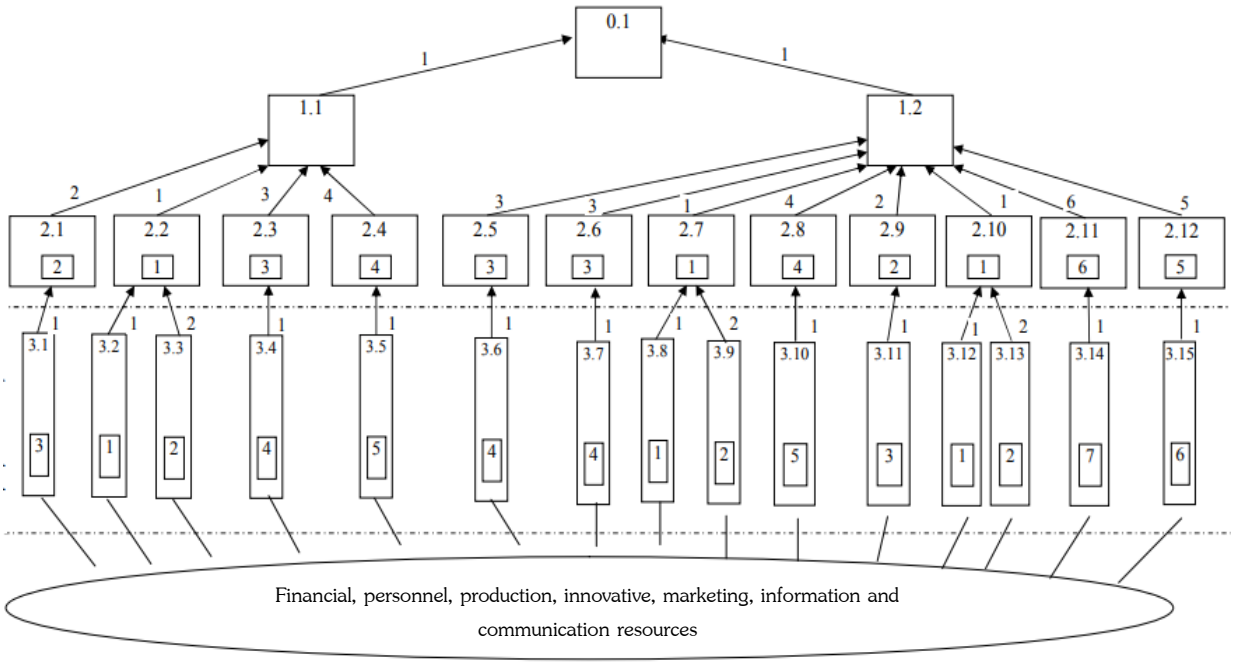

Figure 2. *Goals – Measures – Resources graph for the project to improve the efficiency of project activities at an enterprise in the conditions of Industry 5.0*

Noted. Summarized by the author

Analysis of Figure 2 shows that to achieve the main goal **(0.1)**, it is necessary to achieve two first-level goals **(1.1** and **1.2).** These goals are equally important, so they have the same rank.

Building a goals-measures-resources graph allows you to plan not individual measures, but their interdependence. This allows you to move from planning goals and measures to planning the resources needed to implement them.

The next stage in the development and implementation of projects to improve the efficiency of project activities at an enterprise in the conditions of Industry 5.0 is the formation of alternative ways to achieve the set goals.

Measures to improve the quality of professional training of personnel (MP)

MP 1.1. Signing of agreements with leading universities, institutes, and other organizations for professional development. This measure is aimed at improving the qualification of the enterprise's employees through training at leading educational institutions and organizations. This will help employees acquire new knowledge and skills that will be necessary for effective work.

MP 1.2. Conducting in-house trainings to acquire the latest competencies. This measure is aimed at improving the qualification of the enterprise's employees through conducting in-house trainings. This will help employees acquire new knowledge and skills that will be necessary to solve specific tasks facing the enterprise.

MP 1.3. Development of a motivation system for professional self-development for each employee at the enterprise. This measure is aimed at increasing employee motivation for professional self-development. This can be achieved by providing employees with financial and non-financial incentives to learn.

Measures to improve the financial condition of the enterprise (MF):

MF 1.1. Improvement of the enterprise's accounts receivable policy regarding the adaptation of payment terms. This measure is aimed at reducing the enterprise's accounts receivable. This can be achieved by establishing stricter payment terms for supplied goods and services.

MF 1.2. Improving the enterprise's accounts payable policy. This measure is aimed at extending the payment terms for received goods and services. This can be achieved by negotiating with suppliers.

MF 1.3. Improving the enterprise's depreciation policy. This measure is aimed at reducing the tax burden on the enterprise. This can be achieved by establishing longer depreciation periods for fixed assets.

Measures to improve the production state of the enterprise (MPS):

MPS 1.1. Acquisition of new equipment by the enterprise for technological operations related to key business processes. This measure is aimed at upgrading the production equipment of the enterprise. It can help the enterprise increase labor productivity, as well as the quality of products and services.

MPS 1.2. Renovation of existing equipment at the enterprise. This measure is aimed at repairing and upgrading the existing production equipment. It can help the enterprise extend the service life of the equipment and enhance its efficiency.

Measures to improve business communications in project activities (MBC):

MBC 1.1. Develop a business communication policy that outlines the principles and rules of effective communication in project activities. The first step towards effective communication is establishing clear goals and expectations for the project. This helps all stakeholders understand what is expected of them and avoids misunderstandings. Provide all project stakeholders with access to necessary information. It is essential to choose communication channels that best suit the needs of the specific project. Possible communication channels include face-to-face meetings, phone calls, email, web conferences, and social media. Organize regular meetings and discussions to exchange information and address issues. This helps prevent delays and errors.

MBC 1.2. Implement a reporting and training system that allows tracking project progress and identifying potential issues. Business communication is more effective when there is a culture of openness and trust among all project stakeholders. Encourage open dialogue and the exchange of ideas.

The next stage involves developing alternative scenarios for project implementation. Each scenario is based on one of the alternative measures. Table 3 presents several scenarios for implementing the project to enhance the efficiency of the enterprise's project activities.

Table 3. *Alternative implementation options for the project to improve the efficiency of the enterprise's project activities in Industry 5.0.*

Project variant	Project activities
1	MP 1.1. MF 1.1. MPS 1.1. MBC 1.1.
2	MP 1.2. MF 1.2. MPS 1.2. MBC 1.2.
3	MP 1.3. MF 1.3. MPS 1.1. MBC 1.1.
4	MP 1.2. MF 1.1. MPS 1.2. MBC 1.2.
5	MP 1.3. MF 1.1. MPS 1.1. MBC 1.1.
6	MP 1.2. MF 1.2. MPS 1.1. MBC 1.1.
7	MP 1.3. MF 1.3. MPS 1.1. MBC 1.1.
8	MP 1.3. MF 1.3. MPS 1.2. MBC 1.2.

Noted. Summarized by the author

It is worth choosing one of the project options in which the measures from the proposed list should be implemented. Such an option can significantly improve the level of efficiency of the enterprise's project activities.

8 Discussion. With the development of Industry 5.0, the importance of project management for enterprises is becoming increasingly important. The consequences of the COVID-19 pandemic have contributed to the implementation of these processes. The activities of most enterprises in the context of Industry 5.0 are based on sustainability, digitalization, human-centeredness, and corporate responsibility. Here, a balance of interests between government, business, and society must be achieved. It is noted that the development and implementation of a project to improve the efficiency of an enterprise's financial performance includes seven stages:

1. Formulation of the project goal. The project goal must be clear, understandable, and achievable.

2. Identification of responsible performers. Responsible performers must have the necessary knowledge and experience to implement the project.

3. Selection and appointment of responsible performers. Responsible performers should be selected based on developed criteria. The selection of a team to implement the project is important. The team's actions depend on the entire implementation of the project.

4. Identification of problems. Strategic and current problems that hinder the improvement of the efficiency of the enterprise's activities should be identified.

5. Analysis of problems. A comprehensive analysis of the problems should be conducted to identify their sources and influencing factors.

6. Definition of the strategic goal. The strategic goal should be aimed at solving the main problems that hinder the improvement of the efficiency of the enterprise's activities in the financial aspect.

7. Justification of the directions of efficiency improvement. The main directions of efficiency improvement of the enterprise's activities should be justified, which will be aimed at achieving the strategic goal.

In the future, it would be worthwhile to consider in detail the mechanism for implementing project activities based on the principles of sustainability, environmental friendliness, and social well-being. The authors of the paper also did not address the issue of the positive and negative aspects of combining measures on the quality of personnel, financial, and production status of the enterprise. This is a topic for further research.

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Monitoring the development of entrepreneurial activity of Ukrainian higher education institutions in the scientific field

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ABSTRACT

One of the main activities of Ukrainian higher education institutions (HEIs) is scientific. State HEIs can provide paid services, in particular in the field of scientific and scientific and technical activities. The purpose of this article is to monitor the development of the entrepreneurial activity of Ukrainian HEIs in the scientific sphere based on data on the volume of receipts to the special fund based on the results of scientific activity for 2018–2020 and to formulate proposals for stimulating such activity. In the course of the study, the ABC-analysis method was applied for the phased (2018, 2019, 2020) distribution of HEIs of Ukraine into three groups: A – HEIs with a large amount of income from scientific activity (about 80% of the total amount); B – HEIs with an average level of commercialization of the results of scientific activity (about 15%); C – HEIs with little or no income from scientific activities (about 5%). It was found that in the analyzed period, there was a gradual increase in the results of entrepreneurial activity in the scientific field of 138 Ukrainian state HEIs: revenues of HEIs first increased from UAH 363.688 million in 2018 to UAH 378.522 million in 2019, and then to UAH 460.455 million in 2020 It was noted that a significant share of these revenues (≈79–80%) was the receipts of approximately one-fifth of the HEIs: 19.57% in 2018, 18.84% in 2019, and 23.19% in 2020. The closest to the realization of the Pareto 20/80 principle was 2018, when the ratio of indicators of HEIs and their income was 20/79. It was found that in 2018–2020, 99 HEIs of Ukraine consistently fell into the same groups in terms of the amount of income to the special fund from scientific activities, 21 HEIs increased their positions (both smoothly and in leaps and bounds), 8 HEIs – on the contrary, decreased, and no trends were found for 10 HEIs. External and internal stimulation of the commercialization of scientific activity in HEIs of Ukraine is recommended.

KEYWORDS: entrepreneurial activity, scientific sphere, higher education institutions of Ukraine, ABC-analysis, Pareto principle, monitoring
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1. Introduction. One of the main tasks for Ukrainian universities, academies, and institutes is to carry out scientific activities by conducting scientific research and ensuring the creative activity of participants in the educational process, training highly qualified scientific personnel and using the obtained results in the educational process (Legislation of Ukraine, 2023a). According to the resolution of the Cabinet of Ministers of Ukraine (hereinafter – CMU), higher education institutions (hereinafter – HEIs) belonging to the state and communal forms of ownership can provide paid services, in particular in the field of scientific and scientific and technical activities (Legislation of Ukraine, 2023b).

The main motivation for the provision of services on a paid basis is to increase the inflow of funds to the accounts of HEIs. However, the CMU declared an additional incentive in the field of commercialization of the results of scientific activity of HEIs: the distribution of state budget expenditures for higher education among HEIs, taking into account the indicator of their scientific activity (Legislation of Ukraine, 2024). It is determined depending on the volume of inflows of funds to the special fund based on the results of scientific and scientific and technical works under international cooperation projects, economic contracts and the results of the provision of scientific services per one scientific and pedagogical worker at the main place of work on average over the three previous calendar years.

2. Literature Review. Entrepreneurial activity of Ukrainian HEIs and financing of their scientific activities was studied by a number of scientists: the reasons for the formation of an entrepreneurial university were highlighted (Voronkova &Gurova, 2018); the prospects for the creation and development of entrepreneurial universities in Ukraine are outlined (Durihina, 2021); verification of the Pareto principle was carried out for income from the scientific activity of the HEIs of Ukraine for 2016–2018 (Slav'yuk &Totska, 2021); the current state of funding of scientific activity in Ukraine is determined (Starostina et al., 2018); the financial aspects of the scientific activity of HEIs in the regions of Ukraine were studied and the commercialization of its results was strategized (Totska, 2022); the financing of scientific work in agricultural universities of Ukraine was investigated (Totska, 2023); statistical waves of budgetary funding of education and science in Ukraine was revealed (Totska, 2011). Despite the considerable number of studies on various aspects of the entrepreneurial activity of Ukrainian HEIs and the financing of their scientific activities, with the appearance of new statistical data there is a need for their detailed analysis and monitoring.

3. Methodology. The purpose of this article is to monitor the development of the entrepreneurial activity of Ukrainian HEIs in the scientific sphere based on data on the volume of receipts to the special fund based on the results of scientific activity for 2018–2020 and to formulate proposals for stimulating such activity. In the course of the study, data from the Ministry of Education and Science (hereinafter – MES) of Ukraine were used regarding the results of modeling the formula for the distribution of expenses under the article "Training of personnel of HEIs and ensuring the operation of their practice bases" for

the year 2022 (MES of Ukraine, 2024). The ABC-analysis method was used for the phased (2018, 2019, 2020) distribution of HEIs of Ukraine into three groups:

A – HEIs with a large amount of income from scientific activity (about 80% of the total amount);

B – HEIs with an average level of commercialization of the results of scientific activity (about 15%);

C – HEIs with little or no income from scientific activities (about 5%).

The basis of ABC analysis is the Pareto 20/80 principle, according to which 20% of the causes lead to 80% of the consequences.

Note that the ABC-analysis method was used to diagnose the university's admissions campaign (Totska, 2017, 2018a, 2018b), the ranking of HEIs by the number of winners of the All-Ukrainian Student Olympiad (Totska, 2020).

4. Results. We will monitor the development of the entrepreneurial activity of Ukrainian HEIs in the scientific sphere on the basis of data on the volume of receipts to the special fund based on the results of scientific activity for 2018–2020, since the MES of Ukraine has not yet published more recent data. The obtained results of the ABC analysis are shown in **Table 1**. To save space, intermediate indicators are not shown in it.

Table 1. *Distribution of HEIs of Ukraine by receipts to the special fund from scientific activities (Created by the author on the basis of data from the MES of Ukraine (MES of Ukraine, 2024))*

	Name of the HEI	The volume of revenues in 2018, UAH	ABC group	The volume of revenues in 2019, UAH	ABC group	The volume of revenues in 2020, UAH	ABC group
1	NTU of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute"	35 189 216	A	39 701 580	A	50 177 647	A
2	Lviv Polytechnic NU	33 260 234	A	25 300 562	A	43 409 356	A
3	Sumy SU	23 283 130	A	17 474 388	A	31 878 571	A
4	Prydniprovska State Academy of Civil Engineering and Architecture	18 111 469	A	13 776 467	A	7 830 948	A
5	Ukrainian SU of Science and Technologies	13 887 615	A	14 871 412	A	9 470 974	A
6	Ivan Franko NU of Lviv	13 490 826	A	9 666 023	A	17 418 344	A
7	NTU "Kharkiv Polytechnic Institute"	12 865 129	A	25 045 500	A	5 833 663	A
8	National Aerospace University "Kharkiv Aviation Institute"	11 971 643	A	3 596 189	A	9 233 103	A
9	Kryvyi Rih NU	11 731 899	A	14 397 426	A	19 369 436	A
10	NU of Kyiv-Mohyla Academy	11 075 909	A	8 922 655	A	12 468 265	A

11	NU of Life and Environmental Sciences of Ukraine	10 236 852	A	12 913 770	A	9 746 133	A
12	National Aviation University	9 307 279	A	11 590 986	A	12 005 184	A
13	V. N. Karazin Kharkiv NU	8 057 881	A	10 856 134	A	8 271 343	A
14	National Transport University	7 503 126	A	11 691 788	A	12 087 100	A
15	Kharkiv National Automobile and Highway University	7 295 944	A	7 551 809	A	6 796 846	A
16	Mykolaiv NAU	6 865 520	A	3 500 676	B	5 398 727	A
17	Ivano-Frankivsk NTU of Oil and Gas	6 858 870	A	8 688 061	A	15 665 327	A
18	Kyiv NU of Construction and Architecture	6 476 240	A	6 041 741	A	4 820 389	A
19	Chernihiv Polytechnic NU	5 458 682	A	2 959 072	B	3 270 645	A
20	Kyiv NU of Technologies and Design	5 050 491	A	12 333 591	A	10 099 707	A
21	O. M. Beketov NU of Urban Economy in Kharkiv	5 035 137	A	5 058 318	A	5 529 486	A
22	Kharkiv NU of Radio Electronics	4 964 957	A	4 393 009	A	15 253 798	A
23	Odesa State Academy of Civil Engineering and Architecture	4 422 355	A	7 607 674	A	6 273 289	A
24	Ternopil Ivan Puluj NTU	4 015 743	A	820 817	C	845 241	C
25	Ukrainian SU of Railway Transport	3 814 255	A	4 146 824	A	3 671 648	A
26	Dnipro University of Technology	3 715 545	A	4 433 366	A	7 495 446	A
27	Lutsk NTU	3 644 017	A	1 751 047	B	2 624 964	B
28	Sumy NAU	3 376 324	B	2 306 946	B	2 831 641	B
29	Odesa I. I. Mechnikov NU	3 352 827	B	12 728 180	A	5 441 681	A
30	NU of Water and Environmental Engineering	3 214 641	B	4 272 572	A	2 197 783	B
31	Dnipro State Agrarian and Economic University	3 056 548	B	2 476 095	B	3 239 140	B
32	Lesya Ukrainka Volyn NU	3 013 947	B	2 359 147	B	4 825 314	A
33	Podillia SU	2 319 919	B	2 396 582	B	3 506 927	A
34	Pryazovskyi STU	2 229 989	B	2 877 828	B	2 501 633	B
35	The NU of Ostroh Academy	2 221 324	B	595 333	C	2 244 206	B
36	Vasyl Stefanyk Precarpathian NU	2 185 900	B	1 781 000	B	8 797 051	A
37	NU "Yuri Kondratyuk Poltava Polytechnic"	2 153 387	B	3 616 048	A	2 646 319	B
38	Kremenchuk Mykhailo Ostrohradskyi NU	1 844 091	B	769 629	C	1 416 529	B
39	SU of Intellectual Technologies and Communications	1 830 933	B	2 588 305	B	1 080 671	C
40	NU "Zaporizhzhia Polytechnic"	1 828 312	B	1 432 040	B	1 086 311	B
41	Oles Honchar Dnipro NU	1 803 351	B	3 447 223	B	1 744 418	B
42	Vinnytsia NTU	1 707 192	B	2 644 489	B	1 150 137	B
43	Mariupol SU	1 696 191	B	1 522 658	B	1 248 670	B
44	Black Sea NU named after Petro Mohyla	1 640 995	B	2 509 399	B	2 085 348	B
45	Zaporizhzhia NU	1 603 567	B	2 709 798	B	693 539	C
46	Ukrainian SU of Chemical Technology	1 584 786	B	2 751 931	B	4 143 506	A
47	Kharkiv NU of Construction and Architecture	1 554 770	B	945 757	B	951 239	C

48	Odesa National Academy of Food Technologies	1 524 104	B	749 916	C	1 627 147	B
49	Odesa National Maritime University	1 479 942	B	1 091 313	B	714 148	C
50	Uzhhorod NU	1 454 246	B	1 010 114	B	1 908 098	B
51	Banking University	1 384 918	B	2 146 119	B	1 850 718	B
52	Yuriy Fedkovych Chernivtsi NU	1 237 356	B	442 552	C	557 764	C
53	Ukrainian National Forestry University	1 079 874	B	1 361 394	B	3 554 885	A
54	Khmelnytskyi NU	1 036 475	B	1 078 589	B	1 215 563	B
55	West Ukrainian NU	971 567	B	1 163 258	B	1 516 484	B
56	NU of Food Technologies	945 112	B	567 221	C	826 129	C
57	SU of Trade and Economics	920 781	B	1 297 143	B	1 159 750	B
58	Donbas National Academy of Civil Engineering and Architecture	884 457	B	913 469	B	2 004 841	B
59	Lviv NAU	816 831	C	267 588	C	636 397	C
60	Vinnytsia Mykhailo Kotsiubynskyi SPU	809 000	C	40 000	C	63 960	C
61	Simon Kuznets Kharkiv NU of Economics	789 218	C	373 000	C	610 215	C
62	Vinnytsia NAU	782 000	C	648 658	C	4 400 240	A
63	Dniprovsky STU	774 148	C	1 092 622	B	879 413	C
64	Bohdan Khmelnytsky NU of Cherkasy	766 507	C	1 078 156	B	1 984 848	B
65	Volodymyr Vynnychenko Central Ukrainian SU	745 437	C	634 125	C	28 000	C
66	State Biotechnological University	729 186	C	800 900	C	973 600	C
67	Odesa Polytechnic SU	688 093	C	505 885	C	2 883 991	B
68	NU of Ukraine on Physical Education and Sport	684 635	C	774 458	C	224 907	C
69	National Pedagogical Dragomanov University	682 713	C	244 277	C	588 732	C
70	Yaroslav Mudryi National Law University	681 917	C	1 080 888	B	983 583	C
71	Odesa State Environmental University	607 941	C	594 491	C	352 094	C
72	Zhytomyr Polytechnic SU	607 187	C	1 581 437	B	2 890 818	B
73	Ukrainian Engineering Pedagogics Academy	596 479	C	555 818	C	560 252	C
74	Admiral Makarov NU of Shipbuilding	591 091	C	1 032 677	B	647 754	C
75	Drohobych Ivan Franko SPU	550 844	C	588 282	C	3 236 612	B
76	Dmytro Motornyi Tavria State Agrotechnological University	531 489	C	383 772	C	926 752	C
77	Central Ukrainian NTU	521 500	C	473 300	C	106 177	C
78	T. H. Shevchenko NU "Chernihiv Colehium"	425 000	C	571 917	C	423 934	C
79	Bohdan Khmelnytsky Melitopol SPU	381 002	C	83 333	C	1 620 957	B
80	Kherson State Agrarian and Economic University	371 537	C	477 500	C	447 583	C
81	Bila Tserkva NAU	362 355	C	869 475	C	1 881 500	B
82	Uman NU of Horticulture	360 255	C	335 745	C	415 101	C
83	State Institution "Luhansk Taras Shevchenko NU"	324 100	C	34	C	105 296	C
84	Ternopil Volodymyr Hnatiuk NPU	313 268	C	110 417	C	2 558 279	B
85	Volodymyr Dahl East Ukrainian NU	310 333	C	602 667	C	369 550	C
86	Poltava SAU	234 855	C	434 425	C	1 451 745	B
87	Sumy Makarenko SPU	234 554	C	181 371	C	311 864	C
88	Odesa NU of Economics	231 500	C	555 001	C	315 784	C
89	Kherson SU	226 283	C	734 499	C	647 253	C

90	NU "Odesa Maritime Academy"	178 253	C	419 797	C	1 851 897	B
91	Kryvyi Rih SPU	175 000	C	0	C	115 310	C
92	Donbas State Engineering Academy	171 621	C	409 016	C	321 289	C
93	Donbas SPU	156 270	C	7 170	C	4 040	C
94	H. S. Skovoroda Kharkiv NPU	152 459	C	35 700	C	9 962	C
95	SU of Telecommunications	142 478	C	179 389	C	126 936	C
96	Donetsk NU of Economics and Trade named after Mykhailo Tugan-Baranovsky	141 062	C	199 000	C	369 644	C
97	Zhytomyr Ivan Franko SU	126 291	C	9 167	C	455 055	C
98	Kyiv NEU named after Vadym Hetman	114 167	C	155 610	C	333 675	C
99	Hryhorii Skovoroda University in Pereiaslav	111 000	C	0	C	220 000	C
100	Vasyl' Stus Donetsk NU	104 000	C	0	C	51 000	C
101	SU of Infrastructure and Technologies	98 800	C	195 834	C	567 340	C
102	Polissia NU	94 900	C	210 000	C	679 575	C
103	Donetsk NTU	82 500	C	347 200	C	441 400	C
104	Kherson State Maritime Academy	79 933	C	150 000	C	684 621	C
105	Kherson NTU	73 500	C	161 917	C	1 086 851	B
106	Nizhyn Mykola Gogol SU	67 062	C	25 750	C	2 000 750	B
107	Cherkasy State Technological University	60 000	C	36 000	C	66 667	C
108	SS of NU of Life and Environmental Sciences of Ukraine "Berezhany Agrotechnical Institute"	46 224	C	197 447	C	0	C
109	Ukrainian Academy of Printing	42 500	C	0	C	287 750	C
110	Berdyansk SPU	11 000	C	0	C	73 487	C
111	Kyiv NU of Culture and Arts	0	C	0	C	0	C
112	Pavlo Tychyna Uman SPU	0	C	0	C	28 458	C
113	Stepan Gzhytskyi NU of Veterinary Medicine and Biotechnologies Lviv	0	C	0	C	170 990	C
114	Rivne SU of the Humanities	0	C	0	C	0	C
115	NU "Odesa Law Academy"	0	C	4 000	C	2 924 202	B
116	Lviv SU of Physical Culture named after Ivan Boberskyj	0	C	0	C	0	C
117	Kamianets-Podilskyi Ivan Ohiienko NU	0	C	0	C	25 000	C
118	Poltava V. G. Korolenko NPU	0	C	338 371	C	871 152	C
119	South Ukrainian NPU named after K. D. Ushynsky	0	C	0	C	220 337	C
120	Flight Academy of the National Aviation University	0	C	0	C	0	C
121	Kharkiv State Academy of Physical Culture	0	C	0	C	0	C
122	Kyiv National Linguistic University	0	C	0	C	0	C
123	Oleksandr Dovzhenko Hlukhiv NPU	0	C	33 333	C	91 683	C
124	V. I. Vernadsky Taurida NU	0	C	0	C	0	C
125	University of Customs and Finance	0	C	0	C	0	C
126	V. O. Sukhomlynskyi Mykolaiv NU	0	C	57 000	C	835 880	C
127	Odesa SAU	0	C	0	C	135 833	C
128	Prydniprovsk State Academy of Physical Culture and Sport	0	C	0	C	0	C
129	Mukachevo SU	0	C	0	C	50 901	C
130	Horlivka Institute for Foreign Languages of the State HEI "Donbas SPU"	0	C	0	C	1 859 586	B
131	Izmail SU of Humanities	0	C	0	C	2 012 978	B

132	Luhansk NAU	0	C	0	C	0	C
133	SU of Economics and Tehnology	0	C	0	C	0	C
134	SS of NU of Life and Environmental Sciences of Ukraine "Nizhyn Agrotechnical Institute"	0	C	0	C	240 000	C
135	Vinnytsia ITE of State UTE	0	C	0	C	0	C
136	Azov Maritime Institute of NU "Odessa Maritime Academy"	0	C	0	C	0	C
137	Chernivtsi ITE of State UTE	0	C	0	C	0	C
138	Uzhgorod ITE of State UTE	0	C	0	C	0	C

Note: ITE – Institute of Trade and Economics, NAU – National Agrarian University, NEU – National Economic University, NPU – National Pedagogical University, NTU – National Technical University, NU – National University, SAU – State Agrarian University, SPU – State Pedagogical University, SS – Separated Subdivision, STU – State Technical University, SU – State University, UTE – University of Trade and Economics

Note that the official Ukrainian hryvnia exchange rate (average for the period) in the analyzed period was as follows:

2018: USD 100 = UAH 2,720.05;

2019: USD 100 = UAH 2,584.56;

2020: 1 US dollar = 26.96 UAH (National Bank of Ukraine, 2024).

As you can see, *according to the data of 2018*, group A included 27 HEIs of Ukraine, which earned from 3.644 to 35.189 million UAH based on the results of scientific activity. The top three HEIs-leaders with revenues of more than UAH 23 million look like this:

1) NTU of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute";
2) Lviv Polytechnic NU;
3) Sumy State University.

Note that the accumulated revenue share of 27 HEIs in group A totaled 79.08%.

Group B included 31 HEIs of Ukraine with the amount of income to the special fund based on the results of scientific and scientific and technical works from 0.884 to 3.376 million UAH. Their contribution to the total amount of income was 15.71%. The difference between the lower income position in group A (3.644 million UAH) and the upper position in group B (3.376 million UAH) amounted to 268 thousand UAH.

Group C included the remaining 80 HEIs of Ukraine, in which income from scientific activities did not exceed UAH 817,000 or was absent. The share of the income of the HEIs of this group in the total amount was 5.21%. The difference between the lower position of income in group B (884 thousand UAH) and the upper position in group C (817 thousand UAH) amounted to approximately 68 thousand UAH.

The resulting indicators of the ABC-analysis for 2018 by individual groups of HEIs are shown in **Fig. 1**.

Group of HEIs	Number of HEIs	Share of HEIs, %	The volume of revenues in 2018, million UAH	Revenue share, %
A	27	19.57	287.590	79.08
B	31	22.46	57.138	15.71
C	80	57.97	18.960	5.21
Together	138	100.00	363.688	100.00

Figure 1. *The resulting indicators of the ABC-analysis of the HEIs of Ukraine by receipts to the special fund from scientific activities in 2018 (Compiled by the author on the basis of Table 1)*

So, in 2018, approximately 20% of Ukrainian HEIs provided 79% of total revenues to the special fund from scientific activities. The distribution of the sums earned by the HEIs ranged from UAH 11,000 to UAH 35.189 million, and the ratio between these sums was 3,199 times. In addition, 28 HEIs (20.29%) did not provide paid scientific services in the analyzed period.

According to 2019 data, group A included one HEI less than in the previous period –26. According to the results of their scientific activities, they earned from UAH 3.596 to 39.702 million. The top three HEIs with revenues of more than UAH 25 million have changed somewhat: NTU "Kharkiv Polytechnic Institute" joined NTU of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute" and Lviv Polytechnic NU. Note that the accumulated share of income of 26 HEIs of this group in the total amount amounted to 79.43%.

Group B included the same number of HEIs as in the previous period – 31. The amount of their income to the special fund based on the results of scientific and scientific and technical works was from 0.913 to 3.501 million UAH. Their contribution to the total amount of income was 15.56%. The difference between the lower income position in group A (3.596 million UAH) and the upper position in group B (3.501 million UAH) amounted to approximately 96 thousand UAH.

Group C included the remaining 81 HEIs of Ukraine, in which income from scientific activities did not exceed UAH 870,000 or was absent. The share of the income of the HEIs of this group in the total amount was 5.01%. The difference between the lower position of income in group B (913 thousand UAH) and the upper position in group C (869 thousand UAH) amounted to 44 thousand UAH.

The resulting indicators of the ABC-analysis for 2019 by individual groups of HEIs are shown in **Fig. 2**.

Group of HEIs	Number of HEIs	Share of HEIs, %	The volume of revenues in 2019, million UAH	Revenue share, %
A	26	18.84	300.676	79.43
B	31	22.46	58.887	15.56
C	81	58.70	18.958	5.01
Together	138	100.00	378.522	100.00

Figure 2. *The resulting indicators of the ABC-analysis of the HEIs of Ukraine by receipts to the special fund from scientific activities in 2019 (Compiled by the author on the basis of Table 1)*

So, in 2019, approximately 19% of Ukrainian HEIs provided 79% of total revenues to the special fund from scientific activities. The distribution of the sums earned by the HEIs ranged from UAH 34 to UAH 39.702 million, and the ratio between these sums was 1,167,701 times. 29 HEIs (21.01%) did not provide paid scientific services in 2019.

According to 2020 data, group A included more HEIs than in previous years, – 32. According to the results of their scientific activities, they earned from UAH 3.271 to 50.178 million. The top three HEIs with revenues of more than UAH 31 million were the same as in 2018: NTU of Ukraine "Ihor Sikorskyi Kyiv Polytechnic Institute", Lviv Polytechnic NU, Sumy State University. Note that the accumulated share of income of 32 HEIs of this group in the total amount was 79.95%.

Group B included 34 HEIs, the volume of which revenues to the special fund based on the results of scientific and scientific and technical works amounted to UAH 1.086 to 3.239 million. Their contribution to the total amount of income was 14.89%. The difference between the lower income position in group A (3.271 million UAH) and the upper position in group B (3.239 million UAH) amounted to 32 thousand UAH.

Group C included the remaining 72 HEIs of Ukraine, in which income from scientific activities did not exceed UAH 1.081 million or was absent. The share of the income of the HEIs of this group in the total amount was 5.16%. The difference between the lower position of income in group B (1.086 million UAH) and the upper position in group C (1.081 million UAH) amounted to approximately 6 thousand UAH.

The resulting indicators of the ABC-analysis for 2020 by individual groups of HEIs are shown in **Fig. 3**.

Group of HEIs	Number of HEIs	Share of HEIs, %	The volume of revenues in 2020, million UAH	Revenue share, %
A	32	23.19	368.145	79.95
B	34	24.64	68.545	14.89
C	72	52.17	23.765	5.16
Together	138	100.00	460.455	100.00

Figure 3. *The resulting indicators of the ABC-analysis of the HEIs of Ukraine by receipts to the special fund from scientific activities in 2020 (Compiled by the author on the basis of Table 1)*

So, in 2020, 23% of Ukrainian HEIs provided almost 80% of the total revenues to the special fund from scientific activities. The distribution of the sums earned by the HEIs ranged from UAH 4,000 to UAH 50.178 million, and the ratio between these sums was 12,420 times. 16 HEIs (11.59%) did not provide paid scientific services in the analyzed period. Note that this number has significantly decreased compared to previous years.

As can be seen from **Table 1**, in 2018–2020, 99 HEIs of Ukraine consistently fell into the same groups in terms of the amount of income to the special fund from scientific activities, 21 HEIs increased their positions (both smoothly and by leaps and bounds), 8 HEIs – on the contrary, they decreased, and no trends were detected for 10 HEIs. This is shown in detail in **Fig. 4–5**. Please note that there are no positions with a sequential increase (group C ⟶ group B ⟶ group A) and a sequential decrease (group A ⟶ group B ⟶ group C) of the HEIs.

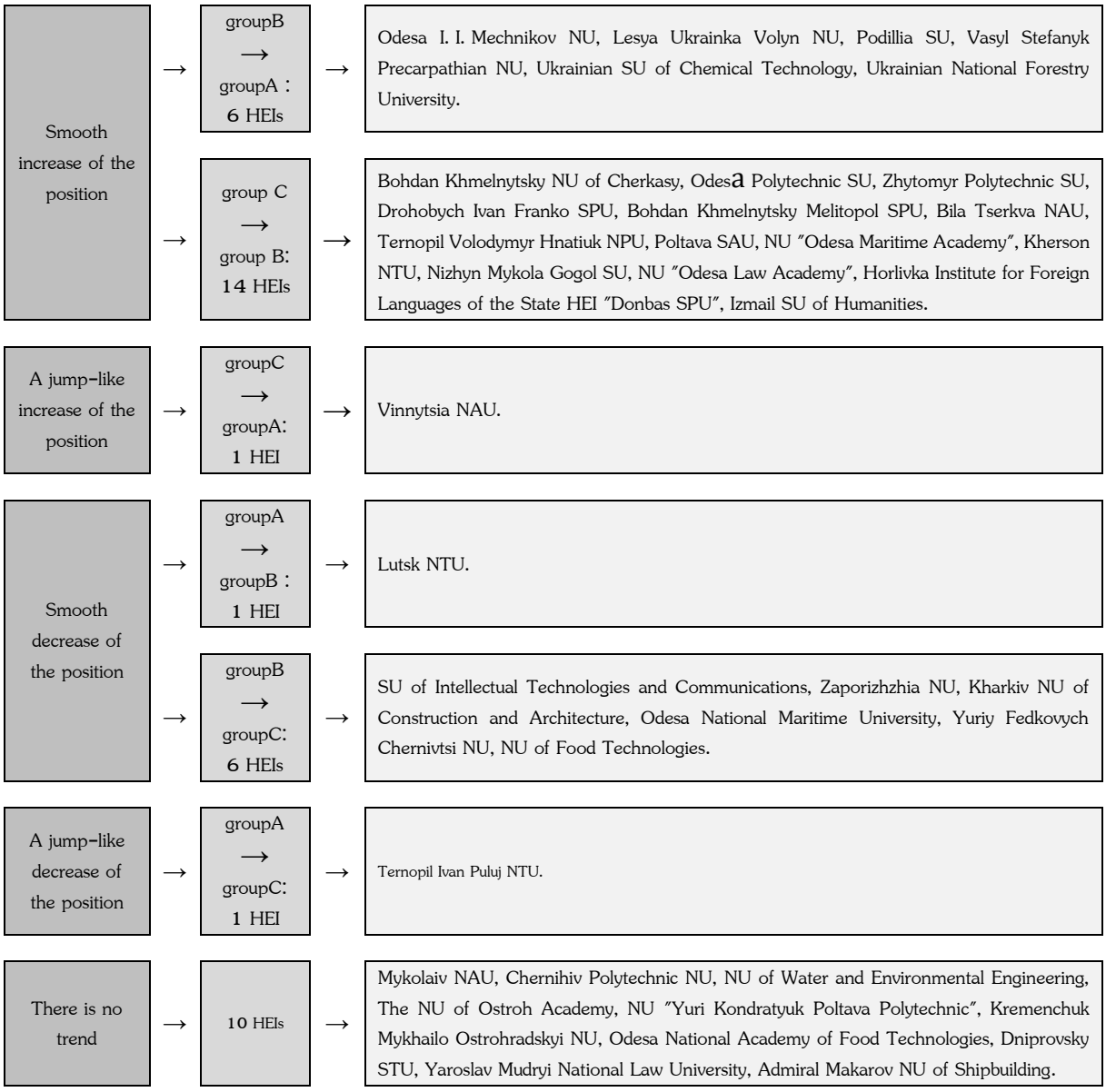

Figure 4. *HEIs of Ukraine with a variable position in 2018–2020 in terms of income to the special fund from scientific activities (Compiled by the author on the basis of Table 1)*

Figure 5. *HEIs of Ukraine with a stable position in 2018–2020 in terms of revenues to the special fund from scientific activities (Compiled by the author on the basis of Table 1)*

5. Conclusions. So, in the analyzed period, a gradual increase in the results of entrepreneurial activity in the scientific field of 138 state Ukrainian HEIs was observed: the revenues of HEIs first increased from UAH 363.688 million in 2018 to UAH 378.522 million in 2019, and then to UAH 460.455 million in 2020. However, a significant share of these revenues (≈79–80%) was the receipt of approximately one-fifth of the HEIs: 19.57% in 2018, 18.84% in 2019, and 23.19% in 2020. The closest to proof of the 20/80 Pareto principle, was 2018, when the ratio of indicators of HEIs and their incomes was 20/79. Then the proportions began to move away from the reference value: 19/79 in 2019, 23/80 in 2020.

During the analyzed period, 15 HEIs did not receive funds from scientific activities at all. This is evidence of the low activity of Ukrainian institutes, academies and universities in the direction of commercialization of the results of scientific and scientific and technical works under international cooperation projects, economic contracts and the results of the provision of scientific services.

In view of the obtained results, it will be appropriate for Ukrainian HEIs to continue external stimulation of such activities by the MES of Ukraine, as well as internally – for example, rating stimulation by the management of HEIs of teachers to such activities. In addition, it will be positive to learn from the experience of HEIs-leaders, to borrow international experience, as well as to form special units of HEIs, which will carry out work on the commercialization of the results of scientific work.

We see further directions of research in the study of the experience of Ukrainian HEIs regarding the rating stimulation of teachers for entrepreneurial activity in the scientific field. It would also be interesting to compare the obtained data of state HEIs with indicators of entrepreneurial activity in the field of science of private HEIs of Ukraine.

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Digitalization as a socio-cultural phenomenon:philosophical reflections

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ABSTRACT

The article is devoted to the study of digitalization as a socio-cultural phenomenon and its philosophical reflections. The process of virtualization and automation, computerization and onlineization, digitization and robotization is a single and global process. At present, Internet is presented to consumers, including as an integrator of all spheres of social reproduction and from our point of view, it is possible to record different forms of convergence and interaction of culture in the Global Web. Cultural issues can also study the integration and interdependence, convergence and divergence of art in Internet, especially in arts such as literature and theatre, painting and cinema, sculpture and architecture, music and entertainment.

The Global Web has many exciting creative projects: 3D tours of art institutions, online broadcasts of international exhibits, artist websites featuring their works, and online painting galleries. All these advances won't replace the "live visit" impact, but owing to digital advancement and ubiquitous digitalization, 3D-technologies are continually improving and content consumers may experience the world's masterpieces without leaving home. The world's most renowned, historic, and respected museums give free, personalised access to detailed information for the inquiring mind. Digitalization must be studied in terms of personal information culture, including computer culture, information aesthetics, and virtual communication culture. Since people spend more time in virtual reality, their uniqueness dictates most cultural value shifts. Digitalization, a new representation technology, will soon shape human aesthetics. Social networks and blogs are among the most prevalent and vital cultural artefacts of modernity, therefore rigorous and comprehensive cultural study of digitality is needed.

KEYWORDS: digitalization, culture, philosophical reflections, Internet, human, modernity

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Formulation or the problem. In the modern world, information technology (IT) plays a great role, they are also extremely important in the development of all without exception spheres of social life: it seems appropriate to mention that AI (artificial intelligence) is the most important word of the year 2023, according to the Collins dictionary (Esther ,2023). We would like to draw research attention to the cultural potential of IT, intentions to introduce and expand automation and computerization, onlineization and digitization, digitization and virtualization, obvious interest in the latter is felt by representatives of almost all professions. Modern culture has an expression, including in technology: virtually all of human cultural life, everything created by it, is online, so the modifications of modern culture in society are expressed mainly in social networks and blogosphere.

Art is present in Internet, and online and offline reality are relevantly compared and intersecting. Because of the pandemic and the Russian-Ukrainian war, art for Ukrainians has largely moved online: if you mention show business, you can see how many representative of it have left Ukraine - their art has become available only in Internet. If culture marks and includes all kinds of social relationships, it is axiomatic that culture is present in nature, man and society, here you can mention Bollywood, with which you can see how technological innovations create a new state of fine art. Art by definition is the most virtual, and it is possible to formulate the general task of Internet - to satisfy the interests of society in the person of its team, organization or individual, everyone is interested in the question: how will Internet cope with them and how does it respond to this challenge? The potential response will be an increase in speed, number of sites, applications and their availability, intensification of state intervention and regulation, conflict between the interests of users and states, awareness of the possibility of Internet to bypass these prohibitions of attempts to circumvent them.

Within the framework of reflections on the future of Internet, the role of artificial intelligence is growing, around which discussions are being held - there is already a real threat from AI in the field of cultural education, when AI can write essays for students, become user contributing to the suppression of natural intelligence. On the other hand, AI is probably a very promising technology, it can be in the form of ChatGPT and Microsoft Bing, Jasper Chat and ChatSonic, Bard AI and YouChat, etc. Particularly interesting in the specified context the latter - it is an alternative chat GPT with some improvements and additions, can communicate in different languages, support different modes of communication, balanced, creative and accurate, and even create graphic works of art at the user's request.

Analysis of recent research and publications. First of all, it should be noted that the idea of artificial intelligence was first expressed by J. McCarthy in 1956 at a conference of Dartmouth College. In 1950, A. Turing published an article entitled "Computing Machinery and Intelligence", in which he first proposed the Turing test to assess the level of intellectual behavior of a computer. Reflection of the topics considered includes consideration of critical theory of new media (V. Benjamin, M. Castels, J. Bodriyar), up to the analysis of cyber culture. The main distinctive feature of the present time is the expansion of digital technologies and the creation of interdisciplinary projects such as Digital Humanities. It would also be possible to refer to the post-structuralist strategy in relation to the text, presented in the works of R. Bart, J. Derrida, M. Fuko, which has consolidated in philosophy such ideas as the diversity of discourse practices, the impossibility of human existence outside the texts, the deconstruction of the text and the totality of language. Many works created by practitioners are devoted to the use of artificial intelligence

in art. They share their own experience and analyze the process of working with technologies (S. Ethon, K. Abchoglu, E. Perlman, etc.). Ukrainian researcher Yu. Trach considers artificial intelligence as a component of artistic creativity, one of the tasks of which is to introduce technical innovations into the sphere of human culture; A. ChibalaŞvili – methods of involving artificial intelligences in artistic practices; T. Sobhyra – the specificity and uniqueness of visual works created using AI-technologies. We can also mention several authors who covered various aspects of the studied issues: for example, Cecotti (2022), Volynets (2018) and Denysiuk(2016).

The purpose of the article. The purpose of the article is to explore digitalization as a socio-cultural phenomenon and to analyze its philosophical reflections.

Presentation of the main material. The actualization of the discourse of the phenomenon of digitalization is associated with an explosion of interest in high-tech, robotization and automation, informatization and computerization. The digitization of all spheres of life has reached a new level, which allows the use of AI - its intensive use has begun: at the same time, the dangers threatened by the application of AI have been revealed. For example, this is the washing out of the average professional link, due to the fact that it is the average by profession most covered by this AI and it shows better results than the average worker - this is demonstrated by strikes in Hollywood, where subordinate to automation professions were representatives of professions, where there is no need for high originality. The average indicator has already been reached by the AI, in the possible near future it will become a source of creative searches, and what is happening to it now can be interpreted as good results for any middle class, but there are fears that it will exceed this, thereby leading to the appearance of "black" and "white swans". As we know, the fears were unfounded: if before there was a threat of nuclear war, it was replaced by the danger of careless use of AI.

The soulless rationality of the modern epoch of his time was pointed out by Oswald Spengler, noting in a well-known aforism that the brain takes over because the soul has retired. Non-reflexively using nuclear energy, space technologies, etc., man became the author of global cataclysms, putting himself on the brink of global disaster. It is important to record the rapidly growing technical capabilities and learning tools that modify our understanding of the educational process and technology. In the situation of the coronavirus pandemic and the current military circumstances are obviously dangerous for communication large audiences, as a result of this cultural learning from full-time and offline becomes, respectively, online and virtual, remote and digital. The proposals of universities in distance learning have been and remain relevant, meaning remote management and differentiated level of access, disciplinary and professional groups by interests, communities in messengers and social networks (Fidas & Sylaiou ,2021).

AI can attract students to online art webinars, resulting in education being completely online. By the way, during the covid there was a significant outflow of citizens in general from visiting almost all cultural and art monuments - for example, museums; mass forms of modern art suffered also damage due to Covid-19. On the other hand, it is possible to observe the interaction of Internet with cultural events taking place in society - the opening and functioning of exhibitions and theatres, museums and circuses, which naturally intensified due to the pandemic and the Russian-Ukrainian war. It should be

remembered that the very concept of "presentation" is also taken from art; there is also a form of modern art – flashmobs, when orchestras go out on the street.

In Internet there are online washers, there are works of art created with the help of Internet programs in every sphere of culture – a significant role here is assigned to electronics. In the field of architecture, houses are already being built thanks to the use of 3D printer technology, in the medical and sports, educational and scientific, economic and environmental spheres of human activity – everywhere are examples of use of digitization and artificial intelligence, for example, in urban planning (Virtual historical cities, 2024). In Internet, we can observe and explore the virtual world of destroyed cultural monuments and find out the conditions of their availability online Kondel-Perminova(2016)

We will give the most relevant, in our view, examples of the spread of technologies in the sphere of culture and art, which have become, however, practically the norm for all museums of the globe. National galleries and art collections of museums have gathered millions of world works of different epochs, many of which are digitized and available for familiarization on the official sites, among these exhibits are many famous masterpieces of painting, sculptures, jewelry, manuscripts and dishes, on the sites of the museums virtual tours are conducted. In the online mode you can see the works of famous masters of the world, get into the processes of restoration and conservation of cultural heritage objects, online galleries support the function of virtual tours to the pavilions, each tour is accompanied by recorded lectures in audio format. Using the sorting function, you can sort works by themes, by ages and techniques, by countries and by the names of the masters who created the work of art. On the sites of museums can be detailed and illuminated the creative path of artists: materials with biography, interesting facts, stories of writing many famous paintings, with a lot of personal things of the artist.

Digitalization and artificial intelligence are general in nature and interact with all spheres of human life, which in their combination can be interpreted as culture in its extended sense. Art involves new technologies, AI can compose literary works and sermons, carry out all kinds of scientific communications and reports, referrals and essays. AI can exhibit its creativity in different styles of painting, graphics, sculpture and architecture and all derivatives - whether it is modernism, romanticism, Gothic, Baroque, Rococo, Empire, AI reveals itself in the fields of theatre, ballet, circus, architecture, music, the art of drama, storytelling, novel, novels, poems, which open the possibilities of AI in a new way. From our point of view, while the possibilities of AI are at the level of the average work of art, yet there are no brilliant samples or even outstanding, written AI, although more and more original and competitive. So, the painting "Theatre D'opéra Spatial", created by the neural network Midjourney under the guidance of programmer Jason Allen, in August 2022 won the competition of fine arts in Colorado (Roose ,2022).

While we are only talking about the possibilities that can be realized in the near future and in our eyes, there is competition between the creators of AI systems, which leads to the acceleration of the result, at least, at the moment. From the point of view of computer science, AI is image recognition, but now it can create samples itself. Given that art in general - is the creation of images, then this is the possibility of the development of AI, when he becomes the creator of the images, because he complements the picture of those images that have already developed and are taken into account when creating new images (Cecotti ,2022).

Now the AI not only repeats, but also creates these images, multiplying them and in the tendency to conceal and even supersede by them all the diversity of human experience and human culture, not fully realizing how dangerous it is for human creativity, let us assume that the materialization of this can resist only human creativity. The experience of past millennia shows that creativity was sufficient for the survival of mankind, although there are known losses of works of art of ancient civilizations, among which the ancient Persians and Hittites, Babylonians and Scythians, Chinese and Indians, the vast majority of the works of culture of which have not reached us.

In today's IT environment, it is possible to preserve the main cultural achievements of mankind, so we can only look at how AI will evaluate all previous human experience. Whether the AI will look for inspiration in it, as we did, or deny it, or simply remain beyond the possibilities that it opens, of course, with different consequences for human culture, but the possibility that humanity will lose the monopoly on culture is also not excluded. AI can obviously change our views, including on ourselves, on its nature and culture (Rothman,2020).

We look to the future with hope, despite the fears that a world war could begin, associated with the use of AI – a war of robots and intelligent weapons. Of course, the most desirable option would be for mankind to prepare for the implementation of the AI project – multilaterally try to see and predict at least the most important of us Consequences, and in connection with contemporary events so that the process of creation of AI does not interfere with the Russian-Ukrainian war, which hypothetically can grow into the third world war, in a nuclear disaster.

Researching military themes and commemorative practices as values of the present and as factors of national identity formation in view of their interactive potential created by social media, we see how a culture of historical memory manifests, how culture is lost due to the destruction of cultural monuments, how and how we ourselves want to leave a memory of all this. Thus (Kulynyak et al.,2023)"The European Union largely coordinates activities on the preservation of cultural heritage objects, the creation of digital access to the cultural treasures of European countries. Thus, as a result of the cooperation of various international organizations, such as UNESCO, IRA (International Council of Archives), IFLA (The International Federation of Library Associations and Institutions), international forums were held, recommendations were developed and approved on the principles of the development of culture as a determining factor of influence on the spiritual and economic progress of society" (p.63).

According to some studies, the virtualization of culture and art reaches approximately 30-40% in Ukraine (Trach ,2018) . This means that about a third or a quarter of all cultural and artistic products and services in Ukraine are created, stored, distributed or consumed in digital form. However, this indicator may vary depending on the area of culture and art, as well as on the region, age, education and other factors of the audience. In the summer of 2022, the Ukrainian Cultural Foundation created an interactive "Map of cultural losses", analysing which, culturologists reflect that we are losing or that we in the future can reproduce as a result of the struggle of the Ukrainians against the Russian invasion (Krechetova, 2022) . An example can be Iraq, which with the help of VR restores the monuments that were lost (Mann ,2022).

Conclusions. Thus, the process of virtualization and automation, computerization and onlineization, digitization and robotization is unified and is global in nature. At present, Internet is presented to consumers, including as an integrator of all spheres of social reproduction and from our point of view, it is possible to record different forms of convergence and interaction of culture in the Global Web. Cultural issues can also study the integration and interdependence, convergence and divergence of art in Internet, especially in arts such as literature and theatre, painting and cinema, sculpture and architecture, music and entertainment.

There are many interesting creative projects on the Global Web: 3D excursions through art museums and online broadcasts from world exhibitions, personal sites of artists with their works, online galleries of painting. All of these innovations, of course, will not replace the "live visit" effect, but thanks to digital progress and widespread digitization as a result of constantly evolving 3D-technologies and the consumer of content has the opportunity to see the world's masterpieces of art without leaving home. Most famous, ancient and respected museums of the world offer their sites with free and personalized access, where you can get comprehensive information for the most curious mind.

Axiomatic need to study digitalization in terms of the formation of information culture of the person, in particular: computer culture, information aesthetics and culture of virtual communication. Since a person increasingly spends most of his life in virtual reality, it is his specificity that determines most changes in the system of cultural values. Digitalization can be considered as a new technique of representation, which in the near future will largely determine the aesthetic experience of mankind. Social networks and blogosphere appear as one of the most common and essential cultural artifacts of modernity, so it is worth stressing the demand for consistent and systematic cultural analysis of the phenomenon of digitality.

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Modern approaches to teaching logic and formation of critical thinking: methodological aspects

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ABSTRACT

An integral approach to the theory and practice of the implementation of the innovation process involves consideration of possible ways and existing contradictions in its development, as well as the generalization of the results of educational experiments in the form of specific patterns. The creation of a new education system, oriented at the international level, requires a review of innovative approaches to the training of future specialists. The main concept of the improvement of the higher education system is to improve the possibilities of assimilation of knowledge in the university environment by using modern technologies and educational systems. The foundation for the innovative educational process is the development and dissemination of advanced achievements in the field of education, as well as the implementation of the obtained educational achievements in practice.

Interest in educational innovations arises from teachers' awareness of the separation of pedagogical theory from practice. Technology is a mechanism that guides the learning process and the entire education system, turning it into a driving mechanism. A practice-oriented scientific foundation is what determines the direction of this transformation. The principle of variability is relevant in the educational system. It allows teachers to choose and develop a variety of learning models, including authoring approaches. The use of innovative methods has increased. Educational technology is a structured system of actions that contributes to the achievement of educational goals. The teaching methodology is connected with various ways of implementing theoretical principles.

A promising direction in the development strategy of the educational system is the implementation of the principle of person-oriented education aimed at cognitive activity. The development of critical thinking becomes a necessary condition for social progress and is an incentive for personal improvement and support of self-realization. Innovative learning technology is a system of clearly defined actions aimed at achieving educational goals.

KEYWORDS: critical thinking, mental processes, educational technology, innovation strategy.
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1. Formulation of the problem. Improving the education system requires research on innovation as a separate field of interdisciplinary scientific knowledge. The intensive development of the innovation process in modern conditions forces us to review approaches to pedagogical technologies. A comprehensive understanding of the theory and practice of designing and implementing the innovation process involves revealing the main trends and contradictions in its development and formalizing the results of these studies in the form of laws, regularities and principles. The creation of an updated education system, focused on interaction with the global educational space, requires significant changes in the direction of innovations in the professional training of future specialists.

The use of pedagogical technologies in teaching logic and critical thinking is important for the development of students' intellectual and analytical abilities. This contributes not only to personal growth, but also to the realization of national interests through the formation of an educational process that actively affects the development of society. The use of interactive methods, such as group work and pedagogical games, promotes the development of logical thinking. Critical thinking and analysis are developed through critical analysis of texts and conducting debates. Additionally, the national context can be taken into account through the study of the country's history and culture. Adapting tasks to national characteristics helps students better understand and discuss national interests. All this contributes to the creation of an effective learning environment and corresponds to national educational goals.

2. Analysis of recent research and publications. Modern approaches in pedagogy about educational technologies are: contextual learning (V.I. Hordienko, O.G. Karpenko, M.D. Kasyanenko); dialogue and modular training (L.N. Herasina, V.G. Alkema, etc.); training using innovations (P.I. Pidkasisty, M.V. Artyushina, I.M. Dychkivska); constructive project training (T.V. Lavrykova, V. M. Sofronova, O.V. Bezpalko, etc.); problem-based modular learning (I.M. Bohdanova, V.I. Orlenko, N.F. Maslova, V.V. Popov, etc.); learning through solving educational problems (V.A. Kovalchuk, V.O. Slastyonin, G.O. Boll, etc.) and game modeling (S.Y. Shashenko, O.V. Ponomarenko, etc.).

3. The purpose of the article. The purpose of this article is to study techniques and methods used in modern educational technologies for teaching logic and critical thinking, as well as the peculiarities of their detection during the professional training of future specialists.

4. Presenting main material. Note that the central idea of the modernization of the higher education system is that increasing the efficiency of acquiring knowledge in a higher educational institution is possible through the introduction of the latest educational technologies and systems.

As O. Dubaseniuk notes, the need for innovative direction of pedagogical activity in the development of education and society in modern conditions is due to several aspects. According to the first circumstance, the entry of Ukraine into the European space requires the renewal of the higher education system, in particular, it concerns the methodology, technology, and methods of organizing the educational process in higher education. It is important to note that the innovative orientation of the activities of teachers and students involves the creation, development and use of pedagogical innovations not only of domestic, but also of foreign scientists and teachers.

The need for continuous introduction of the latest technologies and forms of education organization stems from the need to strengthen the humanization of educational content, change the scope and structure of educational subjects, and introduce new specialties and disciplines. Thus, there is a need to increase the role of the teacher to introduce and implement a more modern and improved approach. Let's emphasize that today innovative activity is becoming more and more selective and nature research. The teacher has greater opportunities to implement his own approaches to the specifics of learning. Because of the new conditions of competition in the educational sector, the question of the competitiveness of higher educational institutions becomes relevant (Dubasenyuk, 2015, p. 74).

Also, the researcher determines the criteria of pedagogical innovation, with the help of which innovative orientation is formed. It is through them that you can assess the effectiveness of a specific innovation. In particular, these criteria include novelty (determining the level of novelty of the experience); optimality (contributes to achieving high results with minimal time spent); the possibility of creative use of innovations in mass experience (presupposes the suitability of tested experience for wide implementation in higher education institutions) (Dubasenyuk, 2015, p. 75).

The expression "critical thinking" indicates the use of cognitive skills or techniques that increase the probability of achieving the desired result. The results of critical thinkers will be better than those of "non-critical" thinkers (Nor&Sihes, 2021, p. 199).

Therefore, the main essence of the educational innovation process consists, firstly, in the assimilation, popularization, and dissemination of advanced pedagogical experience, and secondly, in the implementation of psychological and pedagogical achievements in practice. Solving these two tasks requires an integrated approach.

The reflective aspect is a necessary component of critical thinking, different from a one-sided approach. The main goal is cognitive development, and therefore critical thinking is activated only when a person carefully examines his thought processes. An important place for this type of thinking is assigned to the establishment of standards of mental activity. By developing his own standard of thinking, a person adapts his approach to social problems. Thus, all educational programs promote the development of critical thinking of students who shape the future society (Bekiroğlu&Güllühan, 2022).

It is important to note that theoretical knowledge requires specific tools for practical implementation. And, as a rule, these tools are technologies. It is obvious that the choice of teaching methods always involves the determination of priorities, interactive systems, teaching and education strategies, as well as the work style of teachers and students.

As a higher cognitive skill, critical thinking is essential for decision-making in professional, personal, and public spheres. For students, critical thinking skills not only contribute to their understanding of the subjects they study, but also stay with them long after the specific knowledge has been forgotten (Niu et al., 2013).

Critical thinking helps a person to determine his priorities in his personal and professional life, involves taking individual responsibility for the choice made, increases the level of culture of working with information, forms skills of analysis and formulation of independent conclusions, involves forecasting the

consequences of his decisions and their responsible adoption, allows developing a culture of dialogue in joint activities (Sultanova, 2021, p.45).

Teachers' interest in pedagogical technologies arises from the awareness of the border between pedagogical science and practice. Identifying a scientific theory of learning is not enough in itself. The theory should closely interact with life situations. The key mechanism that should govern the reality of learning and the education system as a whole, to make it a transformational movement, is technology. The engine of this transformation is scientific and practical orientation (Lebedyk et al., 2020, p.18).

Professional training of teachers of higher educational institutions should meet the requirements of technical progress. Educational activity should improve, becoming technological. Currently, the main criterion of pedagogical skill should not be how much educational material the teacher provides, but how he teaches students to independently learn the subject content and adapt to life situations based on social experience. World achievements show that the educational process is considered a learning technology, turning learning into a production-technological process with a certain positive result (Kazak, 2018, p. 27).

Explanations of pedagogical technologies are different, including seeing them as methods, techniques, tools, principles, models of learning and education, previously known as methods of learning and education; special organization of learning content and selection of creative tasks for it; pedagogical technique; algorithm for achieving planned results; designing the process of forming the student's personality; approach to the description of the pedagogical process; a field of knowledge that includes methods, means of learning and the theory of their use to achieve the goals of education (Anishchenko, &Yakovets, 2007, p. 11).

It should be noted that in practice, the term "educational technologies" is used at different levels. First, the general pedagogical level (includes general didactic and general educational technologies that describe a holistic educational process in the region and educational institution). Secondly, the subject-methodical level, where educational technology acts as a "separate method" (a set of methods and means for implementing the specific content of education and training within the framework of one subject or class). Third, the local level (focused on the technology of individual elements of the educational process, such as the cultivation of personal and professional qualities, the formation of concepts, the assimilation of new knowledge, independent work, control, and correction) (Dubasenyuk, 2015, p. 82).

The structure of educational technology includes methods, techniques and ways of planning training, as well as organization and management of educational and cognitive activities of students aimed at forming a culture of educational activity. The content of educational technology consists of scientifically based and rationally selected educational materials and conditions for stimulating the educational and cognitive activity of students (Dubasenyuk, 2015, p. 84).

When organizing the educational process, interactive methods are used, in particular, problem-based learning, work in small groups, project methods, business game, role-playing game, case method, training, information and communication technologies, and others.

For example, the basis of the project method is a person-oriented educational technology, which is aimed at the development of such competencies as independent thinking, cognitive abilities, creative

initiative, the ability to solve problems, predict and critically evaluate the results of one's activities, as well as orientation in the information space.

Regarding the generation of ideas for solving problems and stimulating cognitive activity, the method of "brainstorming" is used, which promotes the active participation of the maximum number of students and forms their creative abilities and skills of expressing their own position.

The pedagogical technology of the case method is based on modeling real situations in order to identify problems, make optimal decisions, and find alternatives. Practically, this method is implemented through the analysis of specific situations that not only challenge students to solve a certain problem, but also activate the knowledge necessary to successfully overcome this problem.

The translation of knowledge into the context of activity can be considered as the use of a business game that focuses on the subject and social content of professional activity. It models systems of social relations and promotes the development of teamwork skills, culture of decision-making, communication, and organizational skills, as well as critical thinking and tolerance.

A current pedagogical strategy that allows all students to be involved is work in small groups. It promotes the development of cooperation skills, communication skills, the ability to resolve conflicts, developing the ability to work as a team and a sense of collective responsibility.

The organization of language communication through role-playing games is a special form that helps to distribute social roles in game plots. Participants of the role-playing game master different manners and ways of behavior, according to different roles in the future profession, polishing psychological techniques and rhetorical skills.

The method of interactive learning, aimed at the development of skills, knowledge, skills, and social attitudes, is presented by the training. In this context, it can be considered training aimed at working out and, accordingly, the formation of certain skills and abilities. It is important to note that training also acts as a psychological means of forming the mental structures of an individual, as a result of which personal experience regarding professional activity appears, motivational and behavioral attitudes are created, and self-confidence and positive self-esteem are formed.

An important aspect in the field of educational technologies is the role of the student in the educational process and the attitude of teachers towards him. There are various types of technologies here, but the main one is a person-oriented approach, which is aimed at putting the student at the forefront of the university's educational system and providing him with comfortable and safe conditions for the development and realization of his natural abilities.

In particular, personal-oriented technologies are defined by an anthropocentric and humanistic focus on the diverse and creative development of the individual. Educational technologies should also contribute to the development of professional and social mobility of future specialists, positively influence their competitiveness in the labor market and help them quickly adapt to educational needs.

The ability of students to formulate a problem is a key element for starting research activities. This ability involves identification, verbalization and discussion. The research orientation of the study takes into account the student's own experience, which is organized by the teacher. The goal is to provide students with the opportunity to creatively master new experiences based on purposeful formation of creative and critical thinking, mastery of educational and research tools, as well as the search and

determination of personal values and value relationships. This approach makes the learning process and its results individual, reflecting the uniqueness of each individual (Strelnikov, 2013, p. 129).

The course "Logic" contributes to the formation of a clear style of thinking, and develops the discipline of thinking and creative abilities in theoretical and practical activities (Yerushevich, 2004, p. 22). It examines the philosophical problems of logical analysis of scientific knowledge, various aspects of teaching logic and the disciplines of the logical cycle, the modern theory of argumentation and the history of logical thinking in Ukraine (Kostytskyi, 2014, p. 7). The study of logic is a simplified way of understanding the principles of creating and using knowledge about various modern technologies (Kuznetsova, 2006, p. 56). A specialist must possess the skills of effective criticism, conduct constructive discussions, substantiate and defend his point of view (Hudzenko, 2020, p. 81].

The use of interactive technologies in the virtual classroom during classes in the discipline "Logic" expands the teacher's ability to present new material in real-time, easily use multimedia technologies, and monitor the work of the group as a whole and each student individually. It also enables students to remotely present their projects on the teacher's computer, express their opinions and participate in collective discussions (Kovalchuk&Ivanytskyi, 2021, p. 96).

The use of critical thinking strategies contributes to the transition from learning methods aimed at memorization to forms of mentoring aimed at the development of students' conscious thinking. In addition, it contributes to the formation of the child's readiness for life in the information society, where it is necessary to be able to distinguish the essential, critically evaluate information, and interact with others (Tyaglo, 2002, p. 32).

Critical thinking techniques are designed to develop a variety of skills, such as distinguishing facts from opinion, determining directions for obtaining information, analyzing and evaluating arguments in texts and statements, formulating different types of questions and answering them according to the source of information or the specifics of the situation, creating your arguments and their evaluation by using refutation, writing different types of texts in oral and written form, effective participation in discussions and debates, development of communication and team skills, ability to critically evaluate information, use of psychological operations during information processing, logical and conscious thinking, identification of causes, prerequisites, and consequences of existing problems, as well as readiness to make efforts to solve them (Hudzenko-Aleksandruk, 2010, p. 147).

An interesting point of view is the pedagogy of critical thinking, which is used in the field of English language learning. In particular, the authors recommend specific lesson plans with elements of critical thinking, looking at techniques, methods, and strategies that can be used to create practical tasks for students to develop their critical thinking skills in the process of learning English as a foreign language (Xue Yin et al., 2023, p. 15).

It is necessary to provide teachers with a scientifically based basis for teaching the principles of scientific thinking. These principles should be combined with evidence-based methods to avoid potential errors in reasoning and belief. When introducing students to the world of science, it is important to familiarize them with the basic principles of scientific thinking. Courses that focus on the development of scientific thinking, as well as those that examine cognitive biases, logical fallacies, and other aspects of the scientific approach, tailored to each grade level, can be effective. Providing students with the basics of scientific thinking will enable them to better formulate and evaluate arguments, and to extend these skills in other areas of study. To determine the best method of introducing scientific thinking into the curriculum, it is important to evaluate the effectiveness of such courses, combining it with scientific research (Schmaltz et al., 2017).

The use of critical thinking methods not only stimulates interest in learning but also contributes to the effective assimilation of the material by students. They also learn to apply new knowledge based on previously learned material, develop the ability to make decisions and resolve conflicts independently or in a group, search, filter and apply information from various sources using modern technologies, as well as effectively perform specific tasks. The development of critical thinking is based on partnership pedagogy and has a universal and interactive character.

Clear explanations that include examples for each thinking skill from different domains are an application of a cognitive principle known as encoding variability (Marin&Halpern, 2011).

Therefore, the development of critical thinking is a complex, systematic, and long-term educational process for students. It includes purposeful, organized and staged psychological activities conducted under the guidance of teachers. It is important to note that mastering the basics and operations of logical thinking allows students to develop a new way of critical thinking, which contributes to the analysis of problems and the search for optimal solutions in various spheres of life (Facione, 1990, p. 8).

5. Conclusions. Summing up, it is worth noting that the principle of variability is actively being introduced into the educational system, which allows teachers to choose and develop various models of educational processes, including author's approaches. Various teaching methods and innovative approaches are widely used.

Therefore, learning technology is a system of clear actions that guarantees the achievement of defined goals; the teaching method is connected with the variety of application of theoretical principles.

The main strategic direction of the development of the educational system all over the world is the solution of issues related to person-oriented education, which focuses on cognitive activity.

It is important to note that the development of critical thinking is necessary not only for the individual but also for social progress. This becomes a necessary condition for moving forward and an incentive for self-realization.

Pedagogical technologies in teaching logic and critical thinking are a key tool for the formation of competent citizens capable of making a significant contribution to the development of their country. The use of innovative methods, such as the use of information technologies and the active implementation

of practical tasks, contributes not only to the assimilation of theoretical knowledge, but also to the development of practical skills.

Pedagogical technologies make it possible to adapt the content of education to modern challenges and realities of the national education system. They contribute to the education of a critical view of events in society and form in students the ability to reasonably analyze and evaluate various aspects affecting national interests.

An important part of teaching logic and critical thinking is the integration of knowledge from other fields such as politics, economics, and culture. It helps students gain a deeper understanding of complex problems and use this knowledge to solve real-world problems.

Thus, pedagogical technologies in the context of teaching logic and critical thinking play a strategic role in the formation of intellectual resources necessary to overcome modern challenges and achieve national interests.

Regarding the prospects of research in this area, they include a deeper study of the peculiarities of improving the methods and techniques used in teaching logic and critical thinking.

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รายนามผู้ทรงคุณวุฒิพิจารณาบทความ(Peer Review)

Professor . Dr. Oksana Polinkevych,Lutsk National Technical University(Lutsk, Ukraine)
Professor . Dr. Dobrodum Olga ,State University of Commerce and Economics(Kyiv, Ukraine)
Assoc. Professor.Ganna Duginets , Kyiv National University of Trades and Economics (Kyiv ,Ukraine)
Associate Professor . Olena Hudzenko ,Volyn National University named after Lesya Ukrainka (Lutsk, Ukraine)
Assistant Professor.Ivan Savchuk , senior researcher, UMR 8504 Géographie-cités (Paris, France)
Sofiia Dombrovska ,PhD .Odesa National Economic University(Odesa, Ukraine)
Dr. Jakkrit Siririn, Technology Promotion Association (Thailand-Japan) , Thailand

บทความทุกเรื่องที่ตีพิมพ์เผยแพร่ได้ผ่านการพิจารณาทางวิชาการโดยผู้ทรงคุณวุฒิในสาขาวิชา (Peer review) ในรูปแบบไม่มีชื่อผู้เขียน (Double-blind peer review) 3ท่าน บทความที่ตีพิมพ์เป็นข้อค้นพบ ข้อคิดเห็นและความรับผิดชอบของผู้เขียนเจ้าของผลงาน และผู้เขียนเจ้าของผลงาน ต้องรับผิดชอบต่อผลที่อาจเกิดขึ้นจากบทความและงานวิจัยนั้นต้นฉบับที่ตีพิมพ์ได้ผ่านการตรวจสอบคำพิมพ์และเครื่องหมายต่าง ๆ โดยผู้เขียนเจ้าของบทความก่อนการรวมเล่ม

Title

Name1

E-mail

Name or Academic position, Institute, Address

Name2

E-mail

Name or Academic position, Institute, Address

Name3

E-mail

Name or Academic position, Institute, Address

ABSTRACT

Abstract is a summary of a research work in which each of its component must be briefly. The contents of an abstract are extracted from the main research work. The components of the abstract in order are 1) Statement of problem 2) Aim / Objective of the study 3) scientific novelty 4) Results . In all abstract could contains 250 words

KEYWORDS:geopolitic,geoeconomic,innovation 3-5words

(Introduction)(Text).....

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(Literature Review)(Text).....

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(Methodology))(Text).....**.....**

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Institute	Russtrat Institute (2020, November 2)*The strategic survival of the Russian economy will ensure the creation of a closed* https://zen.yandex.ru /media/russtrat /strategicheskoe-vyjivanie-rossiiskoi-ekonomiki-obespechit-sozdanie-zakrytogo-klastera-5f9fa45fb09e797cebbd07de
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Example figure

Figure ***1****.Figure title*

large chart (JasmineUPC 12) medium chart (JasmineUPC 14)

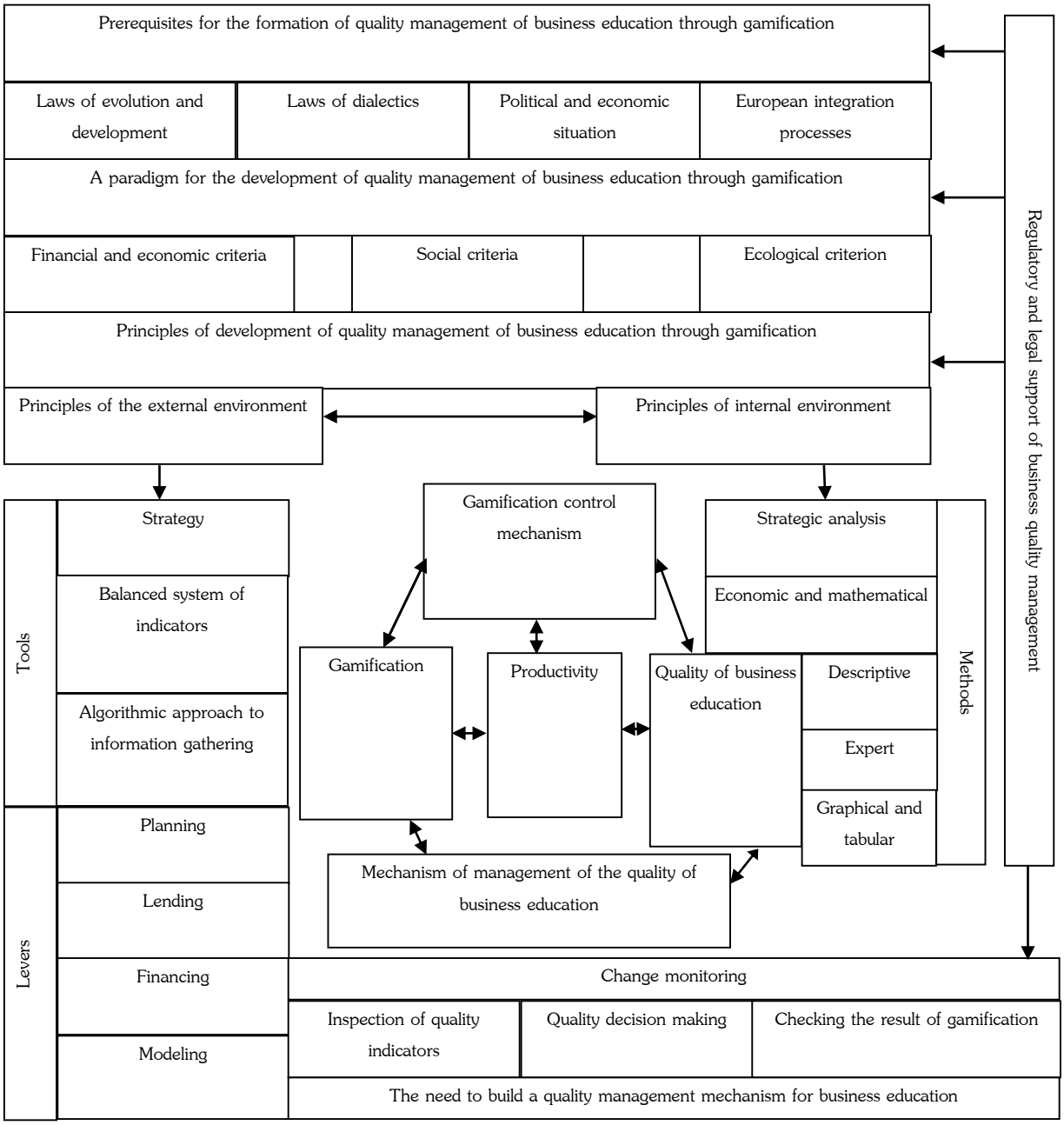

Fig. 2. *Mechanism of quality management of business education through gamification* (Polinkevych & Kuzmak, 2023, p. 35).

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ABSTRACT

The study's aims and objectives.The main novelty of the concepts the author suggests

KEYWORDS:geopolitic,geoeconomic,innovation 3-5words

(Introduction)(Text).....

.....

(Main part)(Text).....

.....

(last part)(Text).....**.....**

.....

(Conclusion and Discussion)(Text).....

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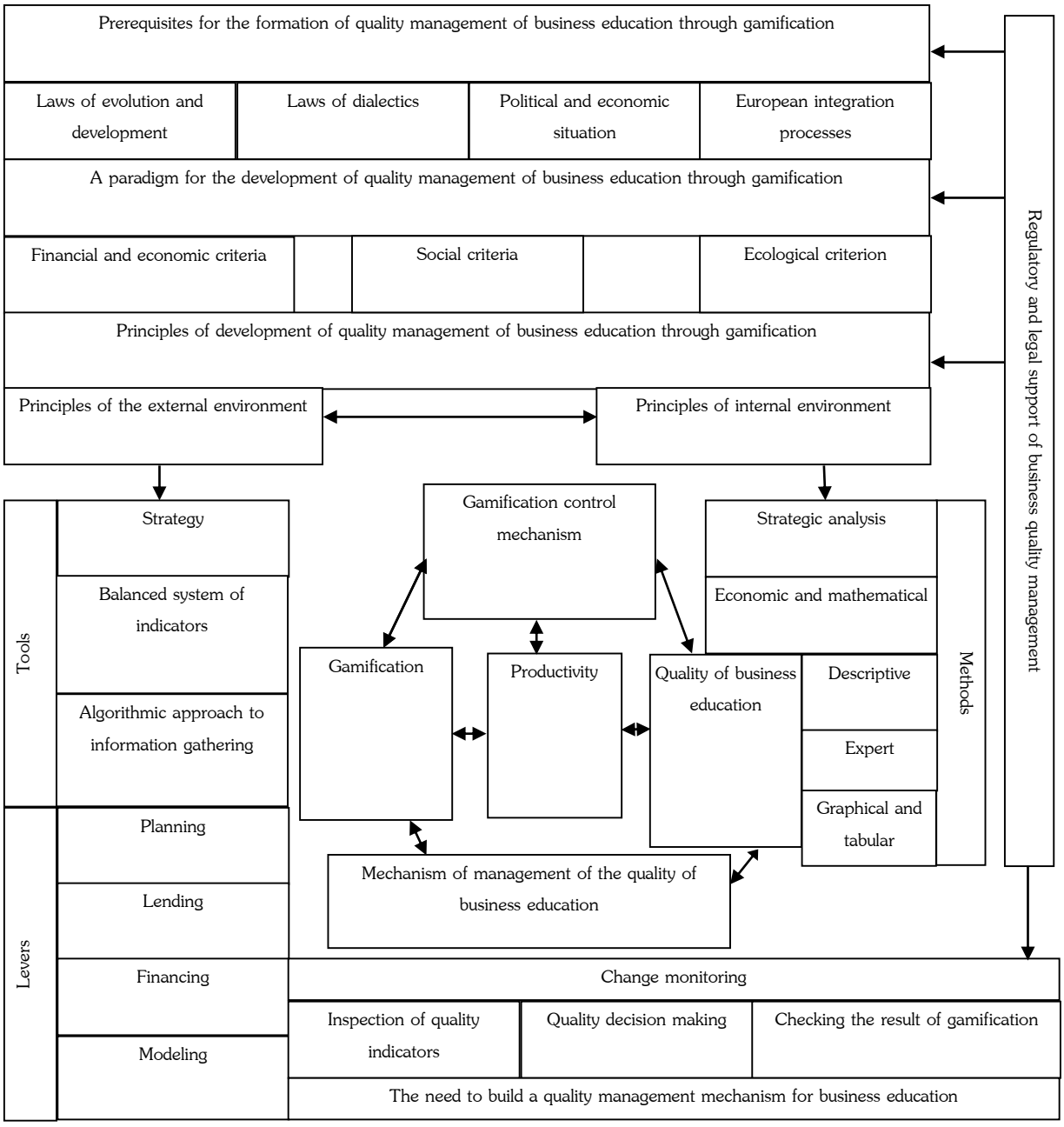

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