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Aleksandra KUZIOR[1], Olena AREFIEVA[2], Zarina POBEREZHNA[3], Serhii AREFIEV[4]

DIGITALIZATION OF BUSINESS PROCESSES IN THE INTEGRATED CONCEPT OF "INDUSTRY 5.0" IN ENSURING INVESTMENT AND SECURITY MANAGEMENT OF TRANSPORT ENTERPRISES

Summary. The article considers the possibilities of integrating the basic principles of Industry 5.0 into the business processes of transport enterprises. Particular attention is paid to the general issues of the essence of Industry 5.0 and determining its genesis. It is established that the digitalization of business processes of transport enterprises on the principles of Industry 5.0 contributes to the formation of new goals, objectives and helps to meet customer needs and expand the capabilities of enterprises through the introduction of digital products. In this context, the main principles of Industry 5.0 include additive manufacturing, transparent production process, hyper-customization and cyber-physical cognitive systems, etc. The author outlines a number of characteristic features inherent in

[1] Faculty of Organization and Management, Silesian University of Technology, 26 Roosevelt Str., 41-800 Zabrze, Poland. Email: aleksandra.kuzior@polsl.pl. ORCID: https://orcid.org/0000-0001-9764-5320
[2] Department of Economics, Faculty of Economics and Business Administration, State University "Kyiv Aviation Institute", 1, Liubomyra Huzara ave., 03058 Kyiv, Ukraine. Email: lena-2009-19@ukr.net. ORCID: https://orcid.org/0000-0001-5157-9970
[3] Department of Economics and Business Technologies, Faculty of Economics and Business Administration, State University "Kyiv Aviation Institute", 1, Liubomyra Huzara ave., 03058 Kyiv, Ukraine. Email: zarina_www@ukr.net. ORCID: https://orcid.org/0000-0001-6245-038X
[4] Hochschule Rhein Main, 18 Kurt-Schumacher-Ring, Wiesbaden, 65197, Germany. Email: arefievso@gmail.com. ORCID: https://orcid.org/0000-0003-2184-458X

Industry 5.0, namely: customer focus, social responsibility, integration of advanced technologies, creation of innovative solutions in the field of flexible production systems, human capital development, and widespread use of digital technologies, which allow the creation of lean, sustainable and innovative production systems. The possibilities of integrating the basic principles of this concept of Industry 5.0 into the business processes of transport enterprises to ensure investment and security management are considered, and a number of advantages that enterprises will receive are identified, namely: improving the level of safety and maintenance; optimization of routes and flights; improving customer service; and reducing emissions into the atmosphere. It is proven that solving the tasks of resource management in the business processes of transport enterprises on the principles of Industry 5.0 in real time is ensured by the use of multi-agent systems, which are built on the basis of a network of small agents and parallel operations. A model for determining the level of implementation of digital technologies in the business processes of transport enterprises is proposed, and the coefficient of return on investment in digitalization is determined, which allows for establishing the level of net income and gross profit received by transport enterprises from increasing the use of digital technologies in their business processes.

Keywords: transport enterprise, Industry 4.0, Industry 5.0, business processes, digitalization of services, digitalization, investment and security management

1. INTRODUCTION

The new technological revolution, Industry 5.0, is based on the combination of virtual and material states in cyber-physical complexes, on the basis of which a single digital ecosystem is created. The development of the concept of informatization of business processes of transport enterprises in conditions of complexity, dynamics and uncertainty should be based on the prospects for the introduction of elements and tools of Industry 5.0. The factors that drive technological transformation are primarily consumer requirements, the need to increase efficiency, and competitive pressure [1].

In the current conditions of economic transformations taking place at the macroeconomic level and covering the microeconomic level, it is appropriate to focus on creating the basis for the sustainable development of transport enterprises. In view of this, the investment and security aspects are becoming increasingly important, contributing to the stability of business activities of business entities, as well as the effective management of the economic security of the enterprise as a whole. One of the basic components of the investment and security management of transport enterprises in the context of Industry 5.0 is the process of preventing losses from negative internal and external influences on economic activity, efficient use of resources, and ensuring the automation of business processes, which is achieved through the introduction of digital technologies.

The application of the general principles of this concept will make it possible to ensure an open, decentralized, digital functioning of business processes of transport enterprises, which will allow making prompt and accurate decisions in the event of unforeseen situations with a quick revision of work plans, solving resource and other problems, which in turn emphasizes the relevance of the study.

The needs of the changing labor market, the prospects for the development of Industry 4.0, and the demand for new competencies required to work with modern technologies allow us to

be quite optimistic about the future [2]. In practice, only a few SMEs are still interested in truly implementing Industry 4.0 technologies. Although the vast majority of large enterprises started using Industry 4.0 technologies almost immediately, most SMEs have optimized, but without a coherent strategy [3, 4]. Clusters can be characterized as a useful tool for Industry 4.0 implementation policy. It can be noted that the attributes of clusters are ideally suited to the tasks of Industry 4.0, and the properties of clusters can become drivers of Industry 5.0 development.

New business models characteristic of Industry 5.0, such as connected organizations with disappearing boundaries and the emergence of digital business ecosystems, can be seen in cluster-related mechanisms. Clusters can provide a favorable environment for the creation and dissemination of knowledge, for the implementation of advanced projects, and for the architecture of platforms or networks in general [5, 6].

2. LITERATURE REVIEW

Although the concept of Industry 5.0 is quite new and was not widespread until 2020, there are currently a number of scientific works on this issue, among which it is worth highlighting in the paper [7], whose research draws a parallel between Industries 4.0 and 5.0 and identifies the general principles of the transition to a sustainable and human-centered industry. In paper [8] analyzed the dominance of Industry 5.0 values in the progressive business models of our time was analyzed. The prerequisites for the emergence of Industry 5.0 are highlighted in paper [9], and the conditions for the implementation of Industry 5.0 in terms of financial support, management and security aspects, as well as approaches to performance evaluation are analyzed the authors in paper [10]. Thus, Industry 5.0 pays attention to the human aspects of production and aims to create human-centered production systems that would ensure the sustainability of the working environment and contribute to the harmonious development of society, it is not only a challenge but also a reasonable continuation of Industry 4.0, which, according to papers [11, 12], although it ensured mass production and accessibility, did not pay attention to the development of human capital in the economy, which in turn led to the outflow of human capital to intangible sectors of the economy.

Despite the fact that there is already a large number of scientific developments in the field of Industry 5.0, the issues of integrating its conceptual foundations into the business processes of transport enterprises require further clarification.

The purpose of the study is to determine the general principles of digitalization of business processes in the integrated concept of Industry 5.0 in ensuring investment and security management of transport enterprises. This contributes to improving the efficiency of transport enterprises with a focus on sustainable development, environmentalization, human-centeredness and resource efficiency.

3. MATERIALS AND METHODS

Today, Industry 5.0 covers more and more areas of society, production, and products. The development of the Internet, robotics, artificial intelligence, and large databases will determine the development of Industry 5.0. Let's consider the evolution of Industry 4.0 through its complement and the development of digital technologies into Industry 5.0:

1. Additive manufacturing using lean elements is an approach in which the production of products is a step-by-step production algorithm. This makes it possible to produce lighter but stronger parts using 3D and 5D printing technology. Such production involves energy savings and rational use of material resources, which increases the environmental friendliness of various industries [13].
2. Transparent production service, with the help of which enterprises can identify and assess uncertainties in the implementation of production plans and equipment operation. The use of the Internet of Things (IoT) enables the use of smart technologies and indicators. The basis of transparent service technologies is an intelligent computing mechanism that provides preventive modeling and management of business processes based on software [14].
3. Hypercustomization is a production system that uses advanced technologies (artificial intelligence (AI), e-learning, cognitive systems, virtual reality (VR)) to train professional consumers who are actively involved in supplementing and improving the final product of the enterprise. This makes it possible to move to more flexible business processes and value chains [15].
4. Cyber-physical cognitive systems, the development of which occurs through the joint cognition of laws, patterns and certain phenomena by people in combination with computers through the implementation of a sequence of actions defined by digital decision-making platforms. The result of the combination of technology and people is modeled in real time

While noting that the general principles of Industry 5.0 development are a logical continuation of Industry 4.0, to understand its essence, identify the root causes and peculiarities of its formation, it is worth considering the entire chain of genesis of Industry 5.0 in the context of the evolution of industry, which has gone through a number of the following stages, Fig. 1.

It is worth noting that this is the difference between Industry 5.0 and Industry 4.0, which moves further and develops digitalization, turning it into a collaboration of human creativity with technology, which makes it possible to create unique products that are as close as possible to the tastes and financial capabilities of consumers. The use of digital technologies allows a company to maintain centralized control at all stages of the life cycle of a product (or service). These include digital design and modeling, digital manufacturing, digital supply chain, logistics, and digital adaptation for the consumer after delivery [16].

Thus, let us outline a number of characteristic features inherent in Industry 5.0:

- customer focus is a key feature that involves the cooperation of human labor with technology, where control over business processes is carried out that are consumer-oriented;
- social responsibility, which aims to achieve sustainable development by reducing the negative impact on the environment, ensuring social justice, and directing business processes to reduce resource use and recycling;
- integration of advanced technologies, such as artificial intelligence, augmented reality, blockchain, and the Internet of Things, to create intelligent and flexible production systems;
- creation of innovative solutions in the development of flexible production systems that quickly adapt to changes in the internal and external environment;
- development of human capital, which means that everyone should use their own unique capabilities in the process of achieving common goals, applying a creative approach to the enterprise, etc.;
- widespread use of digital technologies to optimize existing business processes and create new ones.

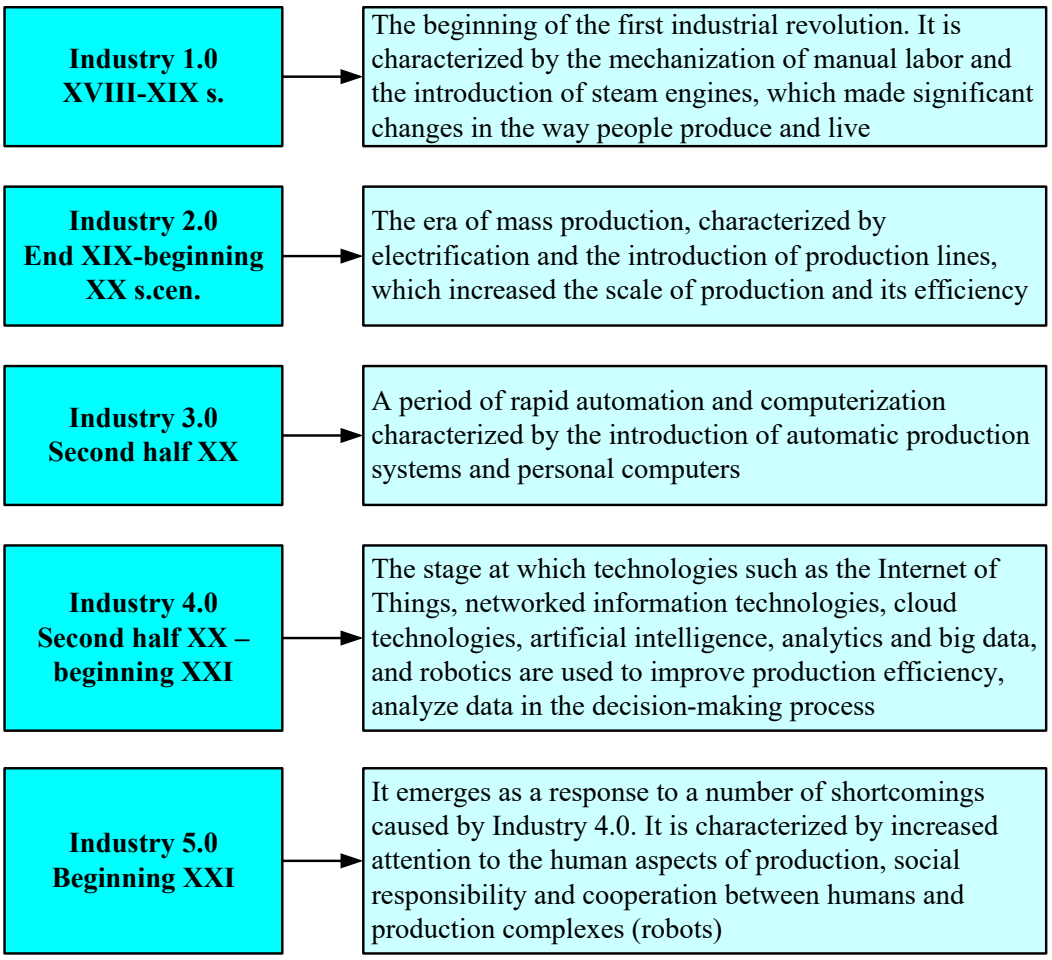

Fig. 1. Genesis of Industry 5.0 in the context of industrial evolution

It is also advisable to highlight the trends in the development of technologies within Industry 4.0, which is increasingly relevant to the problem of creating the prerequisites for maintaining economic security when using high-tech processes [17].

These features make it possible to define Industry 5.0 as a development direction aimed at creating lean, sustainable and innovative production systems. Given the essence and main characteristics of Industry 5.0, we consider it expedient to consider the possibilities of digitalizing business processes in the integrated concept of Industry 5.0 in ensuring investment-secure management of transport enterprises. In our opinion, this can be useful in terms of improving both production business processes and customer interaction.

It is worth noting the main hypotheses of the study:

H_0 - insignificant relationship of the indicator investments in digitization of business process $C_{ID}(t)$ indicator (t) with the volumes of gross profit (GP) and net income (NI) of enterprises;

H_1 - significant relationship of the indicator investments in digitization of business process $C_{ID}(t)$ indicator (t) with the volumes of gross profit (GP) and net income (NI) of enterprises.

Digitalization of business processes of transport enterprises in ensuring financial and information security should be defined as a set of results of turnover with general economic benefits. This implies the active functioning and positioning of enterprises in the market niche, taking into account material and intangible costs [18].

The need to integrate the concept of Industry 5.0 into the business processes of transport enterprises is due to the following shortcomings in their organization and management, including: planning the labor intensity of operations in business processes at enterprises is actually carried out once a year; existing methods and management tools do not allow management to see real progress in individual business processes or operations; the principles of "cost economy" make it impossible to plan and evaluate real profits for individual business projects, management approaches used by the management do not provide the necessary transparency, controllability, efficiency and flexibility in the use of resources; lack of information systems that would provide real-time support for forecasting possible bottlenecks in business processes, which leads to delays in decision-making; corporate systems data are not systematized, so they cannot fully reflect a correct, reliable and accurate picture of business processes.

At the same time, the introduction of innovations in the enterprise should be continuous. In addition, when developing and commercializing new products, it is necessary to focus on the needs of the market, investors and the needs of buyers of goods and services [19]. Enterprises that constantly use innovations and are actively engaged in investment activities have great advantages in the market compared to competitors. This is manifested in increasing the efficiency of activities and helps to successfully withstand all the challenges of the external environment faced by the enterprise [20, 21].

The main advantages and ways to integrate the Industry 5.0 concept into the business processes of transport enterprises in ensuring financial and information security include:

- improving the level of safety and maintenance through the use of intelligent monitoring and forecasting systems will make it possible to identify problems with equipment in advance, which will help avoid accidents and improve safety;
- comprehensive use of data analytics and artificial intelligence in route and flight optimization, planning and resource utilization will help reduce fuel costs and increase efficiency;
- the introduction of innovative technologies, chatbots, automated booking systems and personalized services will help improve customer (passenger) service and ensure greater satisfaction with the use of transport services;
- the development of artificial intelligence systems and analytical tools for decision-making will enable the management of enterprises to make effective strategic and operational decisions;
- introduction of environmentally friendly technologies, reduction of harmful emissions into the atmosphere and optimization of fuel use will ensure environmental sustainability of transport enterprises and help to respond to challenges related to environmental protection, etc.

This necessitates a rethinking of classical approaches to strategic enterprise management, where financial indicators are no longer a key success factor. Within the framework of the Industry 5.0 concept, the business model of a transport enterprise is transformed into a complex ecosystem, where digitalization is not an end in itself, but a foundation for building sustainable and strategic business processes. The central element of such transformation is the creation of conditions for increasing the investment attractiveness of enterprises. Digitalization of business processes in this context allows for the automation of activities, which ensures full transparency of financial and operational flows for potential investors. Digitalization of business processes is designed in such a way that digital tools free employees from routine operations, allowing them to focus on solving non-standard tasks. Therefore, the integration of digital technologies within Industry 5.0 creates a unique synergistic effect. It allows transport companies not only

to achieve technological advantage, but also to create a safe, environmentally responsible and investment-attractive environment.

In this context, the main components of the Industry 5.0 concept in the investment and security management system of transport enterprises can be identified, Fig. 2.

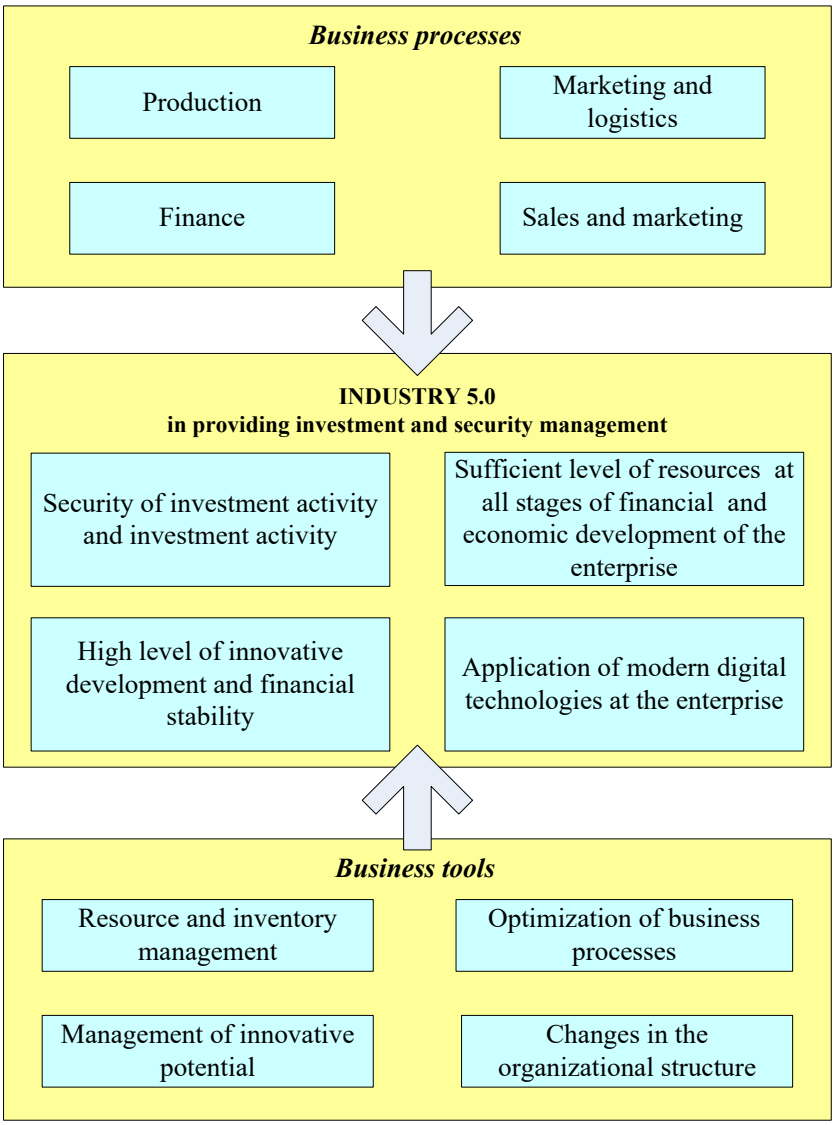

Fig. 2. The concept of "Industry 5.0" in the system of investment and security management of transport enterprises

That is why the development of business models of transport enterprises should take into account the social, environmental and economic aspects of Industry 5.0, which encourages the introduction of digital technologies and automation of business processes, which in turn contributes to their digitalization while ensuring investment and security management. The basic principles of integrating the Industry 5.0 concept into a single outline of the architecture of digitalization of business processes of transport enterprises, Fig. 3.

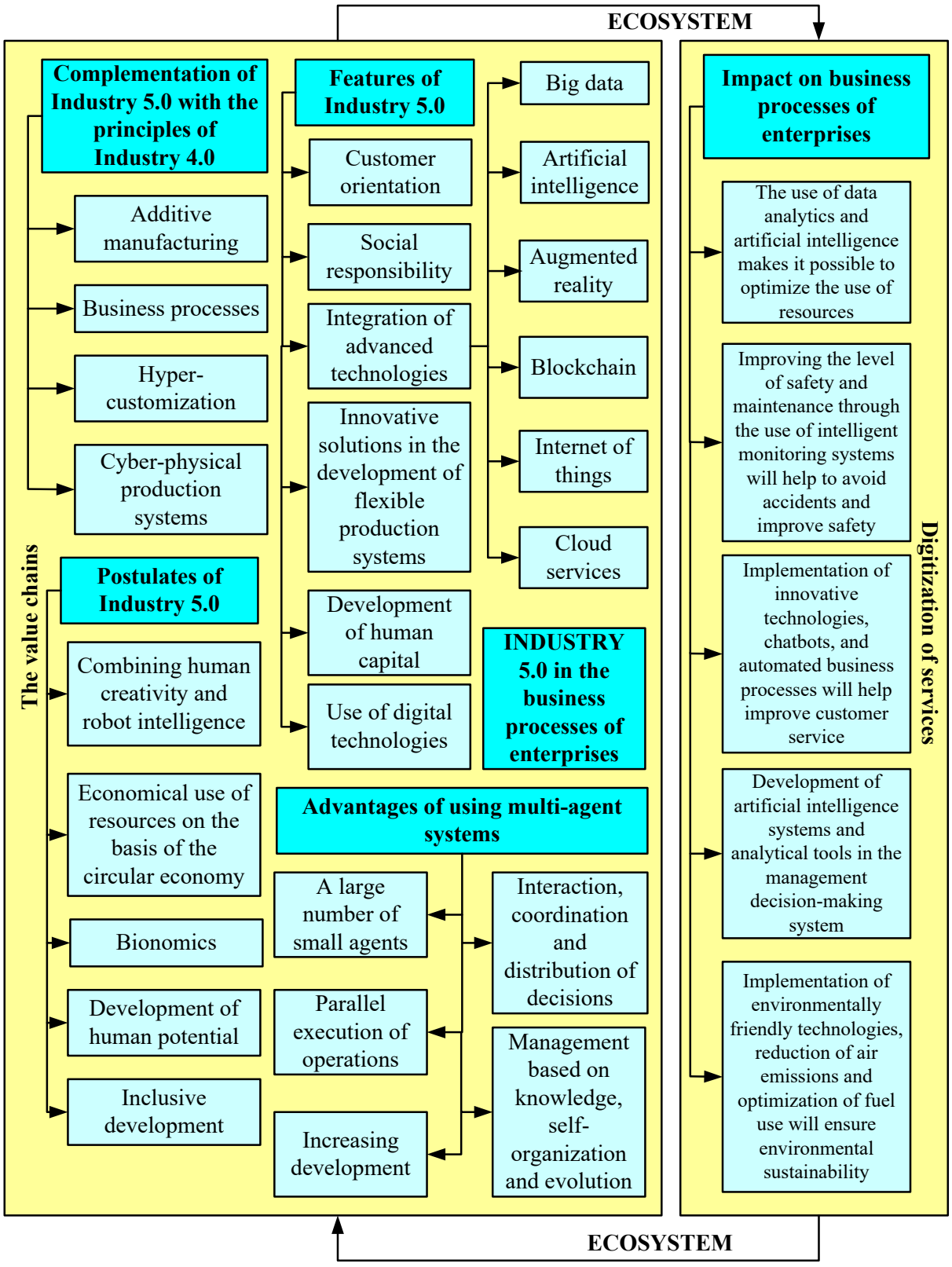

Fig. 3. Principles of integrating the Industry 5.0 concept into a single architecture contour for the digitalization of business processes of transport enterprises

Thus, the main postulates on which the digitalization of business processes of transport enterprises within the framework of Industry 5.0 should be based in ensuring investment and security management include:

1. Combining the creative approach of human labor and robots to create a customized product that best meets consumer demand in terms of price and value for consumers.
2. Comprehensive and maximum use of biological resources in the business processes of an enterprise to achieve a balance between the economy, environment, production, and society, which is ultimately described by the science of bionomics. Bionomics involves solving humanity's problems, such as reducing waste, increasing productivity and ensuring sustainable development through adaptation to change, optimizing efficiency, using renewable resources, recycling, interacting with the environment and using natural models to develop new technologies and innovations.
3. Economical use of resources on the basis of the circular economy, which aims to reduce waste and maximize the use of resources by creating a closed cycle of production, consumption and recovery of resources. The main idea is to produce, use and recycle resources in such a way that they remain in the economy as long as possible, which contributes to sustainable development, reducing environmental impact and conserving natural resources.
4. Developing human potential by investing in human capital, which is aimed at expanding opportunities and improving the quality of life of people by maximizing the use of their abilities, skills, knowledge and creativity. Human potential development is a key factor for sustainable social, economic and cultural development of the society, as it contributes to increased productivity, innovation and quality of life for all people.
5. Ensure inclusive development aimed at creating a just, equal and democratic society in which everyone has the opportunity to realize their potential and contribute to the common good. Inclusive development aims to ensure the participation of all population groups in the development process and equal access to opportunities and resources.

The author proposes a mathematical model for determining the level of digitalization of business processes of transport enterprises, which allows determining the profitability of investments in digitalization and shows a direct relationship with such indicators as net profit and gross profit. The model allows testing the hypotheses proposed by the author: H_0 and the alternative H_1.

To evaluate and forecast the efficiency of using digital business tools, the rate of return on investments in digitization was calculated:

$$C_{ID}(t) = \frac{AP_D(t)}{S_D(t)}, \quad (1)$$

where S_D - digitization costs, t – year,
AP_D - additional profit from the introduction of digital tools.

The relationship of the $C_{ID}(t)$ indicator (t) with the volumes of gross profit (GP) and net income (NI) of enterprises was analyzed.

Pearson's correlation coefficient $P_{(C_{ID})}$:

$$P_{(C_{ID})} = \frac{E(C_{ID}(t)NI(t)) - E(C_{ID}(t))E(NI(t))}{\sqrt{E({C_{ID}}^2(t)) - (E(C_{ID}(t))^2} \cdot \sqrt{E(NI^2(t)) - \left(E\left(NI(t)\right)\right)^2}}, \quad (2)$$

where $E(...)$ is the operation of finding the mathematical expectation.

Let the hypothesis H_0 be an insignificant connection, and the alternative H_1 be a significant connection. To solve the problem of hypothesis testing, we calculate the decisive statistics:

$$u = \frac{|r_{C_{ID}.NI}|\sqrt{n-2}}{\sqrt{1-r_{C_{ID}.NI}{}^2}}, \tag{3}$$

where n is the sample size.

For the significance level $\alpha = 1\text{-}p$, we find the critical value $u_{C_{ID}}(n-2,\ \alpha)$.
If $u < u_{C_{ID}}(n-2,\ \alpha)$, then H_0 is accepted, otherwise the alternative H_1 is accepted. On the other hand, if $u = u^*$ is accepted, then the probability of the significance of the statistical relationship p can be found using the corresponding χ^2 distribution table.

We will use regression analysis to model the relationship. To build the model, we will use a linear regression relationship. At the same time, $NI(t) = c_1 C_{ID}(t) + c_2$:

where c_1 and c_2 - linear and free coefficients that need to be estimated. In the case of the assumption of a normal density of the error distribution, you can use the mean square regression, for which:

$$\begin{cases} \sum NI(t_i) = \sum c_1 C_{ID}(t_i) + \sum c_2\,; \\ \sum NI(t_i) C_{ID}(t_i) = \sum c_1 C^2{}_{ID}(t_i) + \sum c_2 C_{ID}(t_i) \end{cases} \tag{4}$$

From:

$$c_2 = \frac{1}{n}\left(\sum NI(t_i) - c_1 \sum C_{ID}(t_i)\right), \tag{5}$$

Then:

$$\sum NI(t_i) C_{ID}(t_i) = c_1 \sum C^2{}_{ID}(t_i) + \frac{1}{n}\left(\sum NI(t_i) - c_1 \sum C_{ID}(t_i)\right) \sum C_{ID}(t_i)$$

$$c_1 \sum C^2{}_{ID}(t_i) - c_1 \frac{1}{n} \sum C_{ID}(t_i) \sum C_{ID}(t_i) = \sum NI(t_i) C_{ID}(t_i) - \frac{1}{n} \sum NI(t_i) \sum C_{ID}(t_i) \tag{6}$$

$$c_1 = \frac{n \sum NI(t_i) C_{ID}(t_i) - \sum NI(t_i) \sum C_{ID}(t_i)}{n \sum C^2{}_{ID}(t_i) - \left(\sum C_{ID}(t_i)\right)^2} \tag{7}$$

Given that: $c_2 = \frac{1}{n}\left(\sum NI(t_i) - c_1 \sum C_{ID}(t_i)\right)$, we get:

$$c_2 = \frac{\sum C_{ID}(t_i) \sum NI(t_i) C_{ID}(t_i) - \sum NI(t_i) \sum C^2{}_{ID}(t_i)}{\sum C^2{}_{ID}(t_i) - \left(\sum C_{ID}(t_i)\right)^2} \tag{8}$$

The results of correlation and regression analysis indicate that the development of transport enterprises should be based on the use of innovations and digitalization of business processes. The model confirmed the validity of hypothesis H_1 about the significant relationship between the indicator of investments in digitalization of the business process $C_{ID}(t)$ indicator (t) with the volumes of gross profit (GP) and net income (NI) of enterprises. There are certain limitations of the proposed model, which consist of the availability of financial data of enterprises, especially regarding the amount of investment and indicators of gross profit and net income. The scientific novelty lies in substantiating the importance of using digital technologies in business processes of enterprises in order to ensure financial and information security. Digitalization has a positive effect on updating the organizational structure, applying

end-to-end investment and security management methods, modularity of business processes and relevant business tools, rationalization of energy and material support of business processes by complying with regulatory requirements, and applying digital technologies in business processes of enterprises.

4. RESULTS AND DISCUSSION

Businesses that invest in digital technologies can differentiate themselves from their competitors, leading to increased market share and increased profits [22, 23].

To test the proposed proposals regarding the effectiveness of using digital technologies in the business processes of airline companies, we analyzed 5 airline companies: PE "TRANS LOGISTICS", PJSC "DHL INTERNATIONAL UKRAINE", LLC "MERSK UKRAINE LTD", LLC "GOOD LOGISTICS", LLC "SIVA" LOGISTICS UKRAINE" based on data characterizing their activities during 2021-2024 [24-28].

The results of the calculations are given in Tab. 1.

Tab. 1

Results of the correlation analysis of the indicator of return on investment in digitization and net and gross profit

Enterprise	Correlation between $C_{ID}(t)$ and $NI(t)$		Correlation between $C_{ID}(t)$ and $GP(t)$	
	The value of the Pearson correlation coefficient $P_{(C_{ID})}$	p	The value of the Pearson correlation coefficient $P_{(C_{ID})}$	p
PE "TRANS LOGISTICS"	0,9093	0,9940	0,9215	0,9955
PJSC "DHL INTERNATIONAL UKRAINE"	0,2611	0,6914	0,4265	0,8005
LLC "MERSK Ukraine LTD"	0,5915	0,8919	0,5625	0,8774
GOOD LOGISTICS LLC	0,6723	0,9283	0,4911	0,8387
LLC "SIVA LOGISTICS UKRAINE"	0,8976	0,9924	0,8544	0,9849

So, we can conclude that for all 5 enterprises there is a relationship between the profitability index of digitization costs and the main performance indicators - net income and gross profit.

Tab. 2 shows the results of the regression equation for each type of connection, as well as the value of the coefficient of determination R^2.

Tab.2

Results of the regression analysis of the dependence of net income $NI(t)$ and gross profit $GP(t)$ on the indicator of return on investment in digitization $C_{ID}(t)$

Enterprise	Relationship between $C_{ID}(t)$ and $NI(t)$	Relationship between $C_{ID}(t)$ and $GP(t)$
PE "TRANS LOGISTICS"	$NI(t) = 3515550 \cdot C_{ID}(t) - 0{,}2002,$ $R^2 = 0{,}8269.$	$GP(t) = 97109 \cdot C_{ID}(t) - 986312,$ $R^2 = 0{,}8491.$
PJSC "DHL INTERNATIONAL UKRAINE"	$NI(t) = 29634 \cdot C_{ID}(t) + 35625,$ $R^2 = 0{,}0682.$	$GP(t) = 2853{,}3 \cdot C_{ID}(t) + 78609,$ $R^2 = 0{,}1819.$
LLC "MERSK Ukraine LTD"	$NI(t) = 57125 \cdot C_{ID}(t) - 90423,$ $R^2 = 0{,}3499.$	$GP(t) = 25285 \cdot C_{ID}(t) + 627494,$ $R^2 = 0{,}0032.$
GOOD LOGISTICS LLC	$NI(t) = 50455 \cdot C_{ID}(t) - 1423,$ $R^2 = 0{,}2345.$	$GP(t) = 19985 \cdot C_{ID}(t) + 7494,$ $R^2 = 0{,}1002.$
LLC "SIVA LOGISTICS UKRAINE"	$NI(t) = 348755 \cdot C_{ID}(t) + 1233,$ $R^2 = 0{,}6345.$	$GP(t) = 21122 \cdot C_{ID}(t) + 10749,$ $R^2 = 0{,}7289.$

For a visual display of the presented calculations, they are shown in Fig. 4-5.

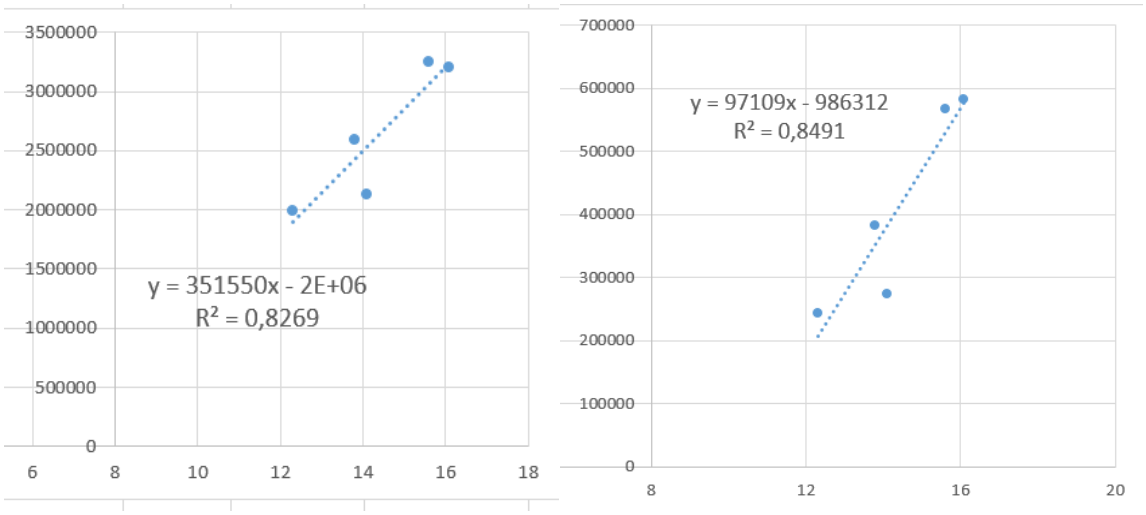

Fig. 4. Modeling the dependence of net income $NI(t)$ and gross profit $GP(t)$ on the indicator of return on investment in digitization $C_{ID}(t)$ for PE "TRANS LOGISTICS"

Based on the simulation results (Fig.4-5), the following conclusions can be drawn:

1. For all enterprises, the value of the indicator of return on investment in digitization $C_{ID}(t)$ has a significant direct relationship with such indicators as net income $NI(t)$ and gross profit $GP(t)$, which speaks of the potential effectiveness of digitalization of business processes at aviation enterprises.

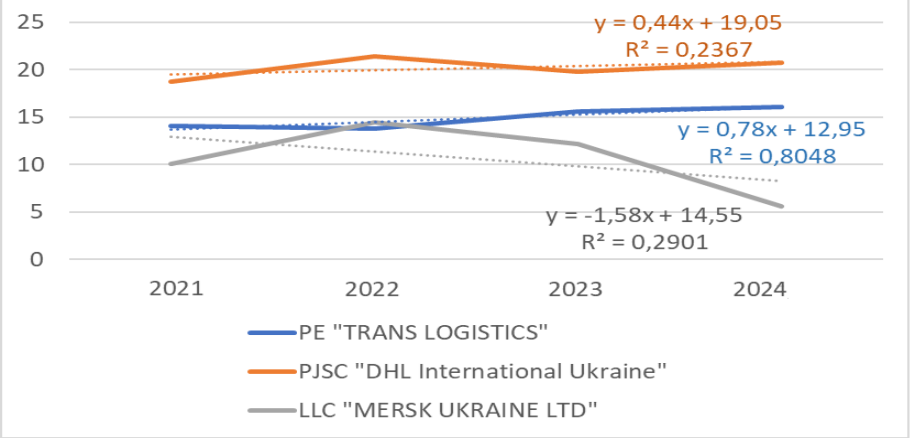

Fig.5. Modeling the dynamics of the $C_{ID}(t)$ indicator for enterprises: PE "TRANS LOGISTICS", PJSC "DHL INTERNATIONAL UKRAINE", LLC "MERSK Ukraine LTD"

2. Based on the results of modeling the dependence of net income $NI(t)$ and gross profit $GP(t)$ on the indicator of return on investment in digitization $C_{ID}(t)$, it can be concluded that with an increase in $C_{ID}(t)$ by 1%, the expected increase in net income $NI(t)$ and gross profit $GP(t)$ with 95% reliability for each of the enterprises will lie within (forecasting income and profit), Tab.3.

Tab.3

Results of modeling

Enterprises	Net income $NI(t)$, thousand *UAH*	Gross profit $GP(t)$, thousand *UAH*
PE "TRANS LOGISTICS"	From 3216785 to 3814315	From 88344 to 105874
PJSC "DHL INTERNATIONAL UKRAINE"	From 10658 to 48610	From 868,3 to 4838,3
LLC "MERSK Ukraine LTD"	From 33149 to 81101	From 22320 to 28250
GOOD LOGISTICS LLC	From 41479 to 59431	From 16998 to 22972
LLC "SIVA LOGISTICS UKRAINE"	From 324779 to 372731	From 18247 to 23997

3. The $C_{ID}(t)$ indicator has an upward trend during 2021-2024 for two of the five enterprises: PE "TRANS LOGISTICS" and PJSC "DHL INTERNATIONAL UKRAINE", for which positive dynamics of financial and economic activity indicators are also observed.

5. CONCLUSIONS

Taking into account the above, it can be concluded that new types of business models will be formed in the global economic system of the future, the business processes of which will take into account the conceptual principles of Industry 5.0, and accordingly, will be based on knowledge, innovations and information aimed at the values determined by the principles of sustainable development. Those transport enterprises that can quickly adapt their business

model to the imperatives of Industry 5.0 and the implementation of digital technologies will win the competition. That is why the primary task facing enterprises is the digitization of business processes, in which human intelligence and cybernetic systems combined with the comprehensive capabilities of artificial intelligence will be successfully combined. This will make it possible to receive effective and individual investment-security management solutions aimed at saving resources and sustainable development.

Digitization of business processes in the integrated concept of Industry 5.0 while ensuring investment and security management of transport enterprises will allow to increase the efficiency of activities, production and provision of services due to the implementation of real-time economic principles in decision-making, adaptive planning of resources at all stages of the product life cycle, intelligent systems for resource management based on multi-agent technologies, enterprise knowledge bases for making security decisions by intelligent systems and performers, restructuring of management principles in order to reduce costs in project management, implementation of the Internet of Things and the constant process of training employees. At the same time, there should be a transition to a network enterprise based on the decentralization of business process functions using multi-agent networks and knowledge bases.

Prospects for further research include the issue of ensuring sustainable competitive advantages of transport enterprises due to the formation of modern business models, taking into account the principles of sustainable development, greening and thrift based on the use of Industry 5.0 tools.

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