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## SECURITY OF ECONOMIC AGENTS UNDER CONDITIONS OF DIGITALIZATION: METHODOLOGICAL BASIS AND APPLIED CONTEXTS

*The article examines the conceptual and categorical apparatus of «digitalization» and the algorithm of digitalization process of economic agents in the context of security conditions. A practical toolkit of methods and algorithms (SADT, IDEF, UML, BPMN) that ensure the automation of work flow management using web technologies has been substantiated. As a result of scientific research, the main vectors of ensuring the safety of economic agents in the modern conditions of the digitalization of economic processes have been identified. On the basis of which, the key forms of implementation of digital processes are characterized on the state and development possibilities of strengthening the security of economic agents. The peculiarities of providing the appropriate security components in the conditions of active processes of economic relations digitalization have been studied.*

*Key words: digitalization, security of economic agents, ensuring the security of economic agents, synergistic effect, digitalization of economic processes.*

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## БЕЗПЕКА ЕКОНОМІЧНИХ АГЕНТІВ В УМОВАХ ДІДЖИТАЛІЗАЦІЇ: МЕТОДОЛОГІЧНИЙ БАЗИС ТА ПРИКЛАДНІ КОНТЕКСТИ

*У статті досліджено понятійно-категоріальний апарат «діджиталізація» та алгоритм процесу діджиталізації економічних агентів в контексті безпекознавчих умов. Обґрунтовано практичний інструментарій методик і алгоритмів (SADT, IDEF, UML, BPMN), які забезпечують автоматизацію управління потоками робіт із використання web-технологій. Як результат наукових досліджень, ідентифіковано основні вектори забезпечення безпеки економічних агентів в сучасних умовах цифровізації економічних процесів. На основі чого охарактеризовано ключові форми реалізації цифрових процесів на стан та можливості розвитку зміцнення безпеки економічних агентів. Досліджено особливості забезпечення відповідних безпекових компонент в умовах активних процесів цифровізації економічних відносин.*

*Ключові слова: діджиталізація, безпека економічних агентів, забезпечення безпеки економічних агентів, синергетичний ефект, цифровізації економічних процесів.*

### Problem formulation

In the modern conditions of economic processes turbulence, the relevance of digitization in the system of ensuring the security of economic agents is steadily growing. This topic becomes especially relevant against the background of the COVID-19 pandemic, in conditions when the resources of business structures may change in the focus of applied aspects and direct their activities to projects for the development of internal efficiency and the provision of a security component. Based on the conducted research, it was established that digital tools for strengthening the security of economic agencies create new risks and challenges, including threats to cyber security, facilitating illegal economic activity, etc.

After all, digitalization is the factor that provides significant advantages for development in this direction. Economic growth and transformation are driven by means of expansion and greater accessibility of digital technologies. Therefore, rapid changes for the development and competitiveness of economic agents towards the use of digital transformations are inevitable. Scientific research makes it possible to assert that digitization acts as a catalyst for innovative development; technological changes have led to the emergence of such opportunities as flexibility, reactivity and individualization of products, but at the same time new challenges and threats have appeared, such as rapid technological transformations, high level of complexity, changing customer preferences and legislative requirements.

### Recent research and publications analysis

The study of modern issues related to the security of economic agents under conditions of digitalization is highlighted by such leading scientists as: B. Andrushkiv, Z. Varnalii, O. Vivchar, A. Baranovskyi, V. Boyko, V. Heits, O. Hoichuk, B. Hubsnyi, M. Koretskyi, O. Kyrychenko, T. Kovalchuk, O. Korystin, B. Paskhaver, Yu. Pakhomov, P. Sabluk, O. Skydan, V. Shlemko, L. Yaremko, and foreign scientists: A. Altukhova, K. Barret, I. Bohdanov, S. Glazyev, A. Gorodetskyi, Yu. Odum, G. Stoloyarov, N. Furs and others.

### Article goals formulation

The purpose of the article is to substantiate the essential characteristic of «digitalization», as well as to study the influence of the digitalization processes of economic agents and tools for ensuring economic security.

### Presenting main material

From the standpoint of an economic determinant, scientific findings point to the fact that digitalization represents the formulation of the definition of this concept, which is a set of processes of innovative development, which find their expression in the relevant technical and technological innovations, focused on the implementation of digitalization of key economic processes and phenomena (i.e. ensuring their maximum automation and bringing the human factor out of the management focus in order to reduce the need to monitor the control of such processes and avoid errors created by this factor), which by their content usually represent a certain set of repeated iterations, within which the personnel potential acquires a mechanical process, which is devoid of an intellectual component, creating an additional reserve for the growth of labor productivity.

Digitalization creates important advantages for enterprises in terms of implementing the chosen strategy, strengthening their economic security, and achieving transparency in business management [3, p. 71].

It is undeniable that the activation of digitization processes has a positive effect on the financial and economic results of economic agents involved in the use of its certain tools and the innovative potential of the state in general. However, equal in importance to the effectiveness of such processes is the issue of ensuring the security aspects of the functioning of both business entities and the state institutional and legal infrastructure under conditions of aggravation of information protection problems, cyber terrorism, complete uncontrollability of certain information zones of the global network (and interactions that take place within their limits, including those of a criminal nature), etc.

Therefore, the current state of affairs shows that it creates a range of challenges related to the need for a thorough analysis of the digitalization processes impact on the capabilities of economic agents to maintain a sufficient level of economic security. It is worth adding that such problems are intensified in the context of the general actualization of the issues of economic agents safe functioning in the conditions of financial, economic and business conditions instability and the era of the post-Covid economy, namely: how these problem contexts should be reflected in the system of ensuring the safety of economic agents.

It should be noted that, based on its functional purpose, the security system of economic agents represents an organized set of interconnected elements (subjects, objects, functional components, conditions and criteria) of an enterprise management infrastructure aimed at realizing the main goal of economic security management of business structures, expressed in ensuring stable and effective development of economic agents, neutralization and elimination of key threats of internal and external sources of origin. It is impossible to ignore the fact that digitalization processes have not bypassed this functional area, actively influencing human resource management tools and generally increasing the economic value of intellectual potential [8].

It has been established that the key effects of digitization within the framework of human resource potential improvement include the following:

- firstly, the emergence of electronic human resource management systems (E-HRM);
- secondly, changes in the labor market situation in the context of intellectualization of requirements for employees and strengthening competitive interactions, both among employers and employees;
- thirdly, increasing the influence of specialized social networks and recruiting platforms; transformation of traditional forms of employment towards a combination of offline employment and remote work;
- fourth, the intensification of intellectual work, the growth of appropriate forms of workload for employees;
- fifth, expansion of opportunities to use the intellectual potential of the organization;
- sixth, actualization of the issue of protecting intellectual property rights [4, p. 740].

It is justified that the practical toolkit includes methods and algorithms (SADT, IDEF, UML, BPMN) that provide automation of work flow management using web technologies. In addition, a graphical recording of the work flow based on the BPMN specification for visual display of work flow models is included, and a software complex for managing automated work flows based on the latest technologies, such as the integration of distributed information systems using web services is noted. This enables the automation of complex distributed processes. The use of work flow management systems helped to develop a complex of software tools necessary for the automation of complex distributed business processes using human resources potential and software systems, as well as to ensure interaction with information and analytical systems and data repositories.

Scientists note that the implementation of economic agents, which comprehensively perform all types of accounting, makes it possible to carry out effective administration of operational and strategic management at the expense of reliable, objective, complete and timely information. It means that it opens up the following opportunities: saving accounting information for all processes in one database; creating any type of reporting in accordance with the needs of management of socio-economic and ecological components of economic activity; optimization of all processes, accounting systems, and therefore, an increase in the level of control; increasing the efficiency of personnel and reducing the costs for administrative and management apparatus; rational use of funds, optimization of operating costs, which as a result ensures the use of financial indicators. The paper argues a sufficient number of facts that confirm: the use of IT, in which all accounting subsystems are used comprehensively, opens up innovative prospects for the enterprise in terms of content and functionality. Based on the experience of ERP systems implemented abroad, it is claimed that domestic software products are improved every year and increase both the list of their capabilities and the results of their use. This undoubtedly improves the process of managing economic agents at all levels.

It has been studied that in modern conditions the economy of Ukraine has both a theoretical, applied and legislative basis in order to strengthen its position among the countries of the world. However, its digitization is still mainly innovative in nature. Therefore, a mandatory requirement for the national economy is the combination of theoretical research with the modern needs and opportunities of stakeholders. Thus, in the focus of new economic processes challenges, during fierce competition, rapid aging of technologies, professions, ideas, penetration of the Internet into all parts of the economy, digitalization has reached a new level of importance for business organizations. In order to support the competitiveness of economic agents, it is necessary to use the possibilities of digitalization in all possible directions and forms: client experience; partnership and collaboration; working with data; implementation of innovations; HR strategy and culture; value management, etc. [7, p.185].

According to scientific studies, it has been established that the concept of digitalization should be considered as a systematic approach to digital transformation, the formation of human resource potential and ensuring the process of digitalization transformation. It is proved that the factors influencing the development of digitalization must be divided into those formed under the influence of macro- and individual factors. Macro factors include: improvement of the legislative and regulatory framework for the development of digitalization; a change in state policy regarding the support and development of certain types of activities. Particular importance in the formation of a successful digitization trend belongs to individual factors, namely: creation of new values, properties of goods; formation of new needs and requests of consumers (focus on saving time, searching and purchasing goods according to clear parameters); the emergence of the latest digital technologies. It has been proven that today's challenges in terms of human resource potential in the conditions of digitalization are formed under the influence of changes in the components of public health care, education reform, science stagnation, social policy, significant influence of migration processes. It has been determined that management based on the principles of digitization is necessarily based on perfect digital strategy planning, assessment of the feasibility of implementing practical digital initiatives, determination of prospective courses of action, selection of an effective model of digitization, forecasting of the expected effect of digitization, comparison of innovative initiatives [2, 57].

Thus, from a practical point of view, it has been proven that the main areas of management systems development under conditions of digitalization in the context of strengthening economic agents security should be: facilitating the accelerated implementation of innovative initiatives, prognostic monitoring of the market environment, assessment of factors affecting the company's competitiveness, development of road maps based on industry priorities and customer experience. At the same time, the formation of human resource potential, the development of the culture and competences of information exchange, and the modernization of IT systems should take place. The listed directions become a necessary condition when creating a corporate digital infrastructure and stimulating the company's innovative appeal. The development of digitalization in the context of ensuring the security of economic agents requires applying the experience of foreign countries focused on business optimization and ensuring the quality of goods and services. The latest ideas, initiatives and programs should be integrated into the strategy of business structures and increase the innovative attractiveness of business [1, 85].

On the basis of the conducted research, it is worth noting a special emphasis on the key aspects of the development of logistics based on the use of information technologies. It is noted that the introduction of modern digital technologies in logistics will lead to changes in the business models of economic agents and strategic plans; will improve interaction between all participants of the logistics process; will improve labor productivity, thereby increasing the competitiveness of logistics companies in the market. It is also stated that the digitalization system in the field of logistics should be considered in the form of a community formed through the use of digital platforms and their applications, by developers, providers and users of logistics services, agents who have experience in the field of logistics and possess certain skills obtained through the use of digital information technologies. The need to create a logistics form that combines logistics principles and modern innovative methods of doing business is substantiated. The basis for these changes should be the introduction of digitalization into the system of financial and economic activity in the context of ensuring the security component. Thus, based on the implementation of digital processes, the quality of the company's activities will improve by automating and optimizing work processes, which will make them more competitive in the logistics services market.

According to scientific studies, it is worth identifying the methodology according to which the project of digitalization of economic agents in the context of security conditions is divided into the following stages:

1) studying current business processes and their transformation (change). At this stage, some processes and technologies are singled out, which, in the opinion of the company's management, are considered relevant for their digitalization. Next, weaknesses are studied and a list of shortcomings and ways to eliminate them is formed during the transformation of the system;

2) implementation of digitalization elements in the organization's activities. First of all, the authors pay due attention to improving the qualifications of personnel who will work in this direction, then business processes in the entire structure are activated, work groups are formed. In the future, it becomes necessary to launch a pilot implementation in one of the structural divisions or to invite an experienced specialist who will test and verify new digital technologies and resources. Such actions will make it possible to open new promising areas of development, which will bring practical experience to the company;

3) strategic stage of digitization. At this stage, the strategic directions of digital transformation of both individual business processes and the organization as a whole are being formed. The effectiveness and productivity of working groups are evaluated. Investments for the digitalization of business processes are allocated and distributed, responsible persons are appointed, deadlines and the standard level of results are determined;

4) digital convergence. Within this stage, the formed working groups develop strategies and operational models of digital transformation taking into account the new infrastructure with its roles, business processes, knowledge and models. Priority technologies, a model of behavior in the digital space, taking into account the specifics of the company's activities, are selected and approved for use;

5) innovative and adaptive stage. It is intended to set the goal of continuous development of the company's potential for the company's management, therefore new technologies appear and they are tested in practice and regular modification and modeling of business processes take place [5, p. 170].

In our opinion, it is worth highlighting that the main development vectors of electronic communications of economic agents combine a wide range of communication technologies, including e-mail, fax, electronic data interchange EDI and electronic funds transfer EFT, the Internet, intranet (corporate Internet), extranet (electronic exchange of information with the outside world) etc. That is why, among the global trends of their development, it is worth noting:

- transfer of business information into digital form;
- joint use of business information, computerization of office management on the Internet;
- removal of physical restrictions in connection with the use of electronic networks;
- construction of the entire production infrastructure based on the use of computers as information devices;
- displacement of the cash method of payment for goods and services, transmission of information about electronic plastic card numbers through telephone networks or by e-mail;
- opening and expansion of opportunities for a new type of mediation: electronic communication begins to perform analytical functions, providing buyers with information about the nature of markets and trades, changes in supply and demand, the appearance of unique or rare goods [6].

It has been established that the digital transformation of the security of economic agents has become not only one of the key trends, but also a market necessity in the era of the information society. The speed of implementation of digital tools and the use of an integrated approach in the development of a digital strategy of business structures are the key to the success of modern business. Therefore, only those enterprises that take the risk of implementing digital innovations first can gain a significant competitive advantage. Actualization of the complexity of digitalization, rather than the fragmentary use of digital marketing tools, is connected with the possibility of achieving systematicity in the process of digital transformation and is able to ensure a synergistic effect.

### Conclusions

Having summarized the above, it should be noted that considering the issue of the influence of digitalization processes on ensuring the security parameters of economic agents must be implemented in the directions – potential threats produced by the active development of digital technologies and in the direction of the opportunities created by them, at the same time, the security of economic agents can be ensured only under the condition of balancing, the specified aspects, which finds its practical implementation in the construction of an effective dynamic system of information protection of the enterprise (starting with the issues of virtual security, terminating with image aspects in the field of PR) together with the formation of a system for monitoring the market of digital innovations for potential effectiveness and opportunities for their implementation into the economy practice of business structures.

It has been established that the growth of the digital economy contributes to the emergence of many new economic opportunities. Digital data can be used for the development purposes as well as for solving social problems. Thus, they can contribute to the improvement of economic and social indicators, development of innovations and increase of productivity. Digital platforms simplify transactions, networking and information

sharing. From the point of view of economic agents, the transformation of all spheres and markets under the influence of digitalization can help improve the quality of goods and services while reducing costs. In addition, digitalization is transforming the value chain in a variety of ways, opening up new opportunities for increased added value and broader structural changes based on the economic security mechanism. Therefore, future research in this direction has a high scientific value. Considering the rapid pace of development of IT technologies, models and methods of digitalization projects in the context of ensuring the security of economic agents require further continuous development.

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