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DIGITALIZATION OF INVESTMENT PROCESSES: RISK-MANAGEMENT AND ECONOMIC SECURITY¹

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Introduction. The modern world is undergoing a continuous transformation, where the development of digital technologies plays a special role. The digital era has a significant impact on all sectors of the economy, including investment activity. Digitalization of investment processes opens up new opportunities for efficient capital investment, ensuring flexibility and efficiency of asset management, as well as expanding the geography of investments. However, along with the benefits, digital transformation also carries new risks. Thanks to technological innovations, the investment market is becoming more accessible, but at the same time more vulnerable to cybercrime, technical failures and other negative factors. In addition, the incomprehensibility and unpredictability of some technological decisions can lead to incorrect investment decision-making. In this context, ensuring economic security in the field of investment is becoming a key priority. It is important to develop strategies and mechanisms that would help minimize the risks associated with digitalization and ensure the stability and reliability of investment processes.

Also, it is impossible to ignore the fact that the global economy is undergoing significant changes as a result of global challenges such as the COVID-19 pandemic, political instability, military conflict and climate change. In light of these challenges, digitalization can serve as an effective tool for adapting investment strategies to changing conditions.

In view of the above, it becomes clear that this topic is extremely relevant and requires in-depth scientific research, which would help determine the optimal ways of development and regulation of investment activity in the context of digital transformation.

Analysis of recent research and publications. Digitalization has influenced the development of many business areas Mayer-Schönberger V. & Cukier K. [1], Porter M.E. & Heppelmann J.E. [2], Setiawan I., Kartajaya H. & Kotler P. [3]. Digital globalization makes international companies more dependent on others, making them more exposed to the risks they face and partner units Lund S., Manyika J., Woetzel J., Barriball E. & Krishnan M. [4].

Scientists Luo Y. [5], Schwab K. [6], Tropmann-Frick, M. [7] identify risks that range from over-reliance to cyberthreats. The impact of digitalization on investment while transmitting a valuable stream of ideas and

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innovations around the world have been explored in the papers egroponte, Negroponte N., Flusser V., Gouveia T., Wright A., Tapia A., Chambel M.I., Gilieson K. (ed.) [8], Solis, B. [9], Baoill A.Ó. [10]. However, questions about making managerial decisions on investments in the context of digitalization remain open.

Objectives of the article. Main task is to study and analyze the digitalization process in the investment sector, identify the main risks and identify strategies for ensuring economic security in the context of digital investment. The study uses descriptive analysis to describe the main trends and changes in the field of investment processes due to digitalization, to the ace stage for a detailed analysis of specific examples of companies or investment projects that use digitalization in their investment processes, qualitative analysis methods for a comprehensive understanding of the impact of technology on the investment sector, to obtain primary data and a deep understanding of the problem being studied. These methods together will allow us to cover both theoretical and practical perspectives of this problem, which will contribute to a deep and comprehensive analysis.

The main material of the study. First of all, a study was conducted on the basic concepts and trends associated with the digitalization of investment processes. The result is presented in the form of table 1. The table provides basic concepts and trends related to the digitalization of investment processes, including the definition of digitalization and examples of the application of these concepts in the real world:

Table 1

Definition of "Digitalization"

The essence of the concept of digitalization	Author	Examples
Digitalization as a process of transition from analog to digital technologies	Nick Negroponte	E-commerce, digital platforms, mobile apps
Digitalization as the introduction of information and communication technologies in various spheres of life	Klaus Schwab	Internet of Things, artificial intelligence, virtual reality
Digitalization as a change in business models and investment processes	Philip Kotler and Hermavan Kartajaya	Fintech, cryptocurrencies, blockchain
Digitalization as a strategic perspective of investment activity	Michael Porter and James Hepelman	Smart contracts, robot advisors, automated asset management
Digitalization as integration of traditional and digital communication channels	Brian Solis	Omnichannel, Social Media, Content Marketing
Digitalization as the use of large amounts of data for decision-making	Viktor Mayer-Schönberger and Kenneth Kukier	Data drive marketing, analytics, machine learning
Digitalization as changing the role of users and consumers	Henry Jenkins	Co-creation processes, user-generated content, consumer feedback
Digitalization as the development of global networks	Manuel Castells	Global networks, decentralization, virtual communities

Source: structured by the author based on [1–3; 6; 8–11]

On the basis of scientific publications, it is established that the digitalization of investment processes means the use of digital technologies for managing investment portfolios, conducting trade, market analysis and other related processes. This may include the use of algorithmic trading, robo-based advisors, digital investment platforms, etc. Blockchain technology and cryptocurrencies have become significant elements of modern investment landscape. They offer new opportunities such as decentralized finance (DeFi), but also bring new risks such as cryptocurrency price volatility and security risks.

And the analysis of the causes and consequences of the widespread use of digital technologies in the field of investment led to the conclusion that these technologies have gained great popularity in the investment sphere, and this has its causes and consequences.

Reason:

Efficiency and speed: Digital technology allows operations to be carried out significantly faster than traditional methods.

Accessibility: The Internet makes investments accessible to a wide range of people, not just professional investors.

Automation: The development of robotic systems and algorithmic trading makes it possible to automate the investment process, reducing human error.

Big data for analysis: Digital technology allows large amounts of data to be processed, enabling more accurate market analysis.

Consequences:

Increased trading volume: The ease of access to investment platforms has increased the number of investors and trading volume.

Lower cost of investing: Digital platforms have reduced the cost of investment by making it more accessible.

Impact on market volatility: Speed and automation can contribute to market volatility, especially with the massive use of algorithmic trading.

Cyberattack risk: As in other areas where digital technologies are used, the investment sector has become more vulnerable to cyberattacks.

Need for regulation: The widespread adoption of digital technologies requires new regulation to ensure transparency, safety and protection of investors.

Democratization of investment: Previously, the investment sphere was available mainly to large investors or financial institutions. Thanks to digital technology, more people have the opportunity to invest, which in turn stimulates economic growth.

Fintech startup development: The demand for digital investment solutions is fueling the growth of fintech startups offering new products and services, including the development of cryptocurrencies and blockchain technologies.

Increased risk of financial fraud: Digital technologies, while providing greater transparency, can also be used for financial fraud or market manipulation.

Change in vocational training: The demand for new skills and knowledge in the field of digital technologies leads to a revision of curricula in universities and vocational courses.

Quick response to market changes: Digital technology allows you to quickly respond to market changes, which can be useful in rapidly rotating situations.

Overall, digital technologies in the investment sector bring many benefits, but they also create new risks and challenges that require attention and regulation.

The study of trends related to the digitalization of investment processes allowed us to reveal how the process of making managerial decisions on investment has changed and to provide general trends in changes in the direction and sphere of investment.

The main dependencies are:

Using big data and analytics: Modern investment processes are increasingly based on the use of big data and analytics to make effective management decisions. This allows managers to better understand market trends, identify opportunities and risks, and develop investment strategies taking into account market dynamics.

Automation and robotics: Investment processes are becoming more automated and robotic through the use of algorithmic trading, robot advisors and other technologies. This helps reduce transaction costs, increase efficiency and reduce human-related risks.

Changes in investment areas: Thanks to digitalization and new technologies such as fintech, cryptocurrencies, blockchain, new areas of investment have become available. This opens up new opportunities for investors and also requires adaptation to new risks and challenges.

Globalization of investment processes: Investment processes are increasingly integrated globally due to the availability of international markets, digital platforms and networks. This enables investors to expand the geography of investments, but also requires an understanding of international risks and regulatory requirements.

Changes in the process of making management decisions on investment: From traditional to data-driven approach: Previously, investment decision-making was mostly based on the intuition and experience of managers. Thanks to digitalization and big data analytics, managers can now make more informed decisions because they are based on real data, forecasts and models.

Integration of different sources of information: In the investment decision-making process, managers can now use various sources of real-time information such as news, social media, market data, and others. This allows them to respond faster to changes in market conditions.

Using technology to optimize processes: Technologies such as artificial intelligence, machine learning, and automation enable you to optimize decision-making processes, increasing speed, accuracy, and efficiency. It also allows companies to focus on strategic aspects of investment activities.

Changes in directions and areas of investment:

– Fintech startups and companies are actively attracting investments to develop new products and services that differ from traditional financial models such as mobile payments, peer lending and robot advisors.

– Investments in cryptocurrency assets and blockchain technologies continue to grow. These innovative technologies are used to create new types of assets, decentralized platforms and financial services.

– Growing environmental awareness and increased regulation are driving investment in green technologies such as renewables, water treatment and resource conservation.

– In recent years, there has been an increase in investment in biotechnology and medical innovations such as genetic engineering, personalized medicine, and telemedicine. This reflects growing scientific capabilities and increased public health requirements.

– Investments in educational technologies such as online learning, adaptive learning, and virtual reality are growing as they can transform the educational process and increase access to education.

These changes reflect how digitalization affects investment processes, changing the way we make decisions, as well as directions and areas of investment. In the future, we can expect these trends to continue to develop, leading to a further transformation of the investment landscape.

Investments in the development of the Internet of Things and artificial intelligence continue to grow as these technologies have the potential to revolutionize a range of industries, from manufacturing to medicine and transportation.

New communication technologies, such as 5G, require significant investment to deploy networks and develop new applications. This could open up new opportunities for investors as 5G transforms various industries, including autonomous vehicles, telecommunications, and e-commerce.

With the increasing number of cyberattacks and data breaches, cybersecurity investments are becoming increasingly important. Cybersecurity companies are developing new solutions to protect data, networks, and infrastructures from intruders.

Space investment and aerospace innovation are on the rise thanks to private sector efforts such as SpaceX and Blue Origin. These companies are developing new technologies to explore space, which can open up new opportunities for investors.

Investments in consumer technology and entertainment continue to grow, particularly in virtual and augmented reality, streaming services and mobile gaming.

Trends related to the digitalization of investment processes indicate the strengthening of the role of data and analytics in investment management, as well as changes in investment directions (Table 2). Investors should keep an eye on these trends and ensure their ability to adapt to change to maximize profits in an ongoing transformation.

Table 2

Trends related to the digitalization of investment processes

Period	Causes and consequences of the widespread use of digital technologies in investment	Digital investment decision-making tools	Sphere (directions) of investments	Global trends
2000–2010	Internet spread, globalization, access to mass data	Algorithmic trading, electronic platforms	IT, fintech, energy	Internet, mobility, renewable energy
2010–2015	Development of social networks, mobile applications, expansion of information channels	Robo-consultants, investment applications	Ecommerce, startups, energy	Social networks, mobile applications, sustainable development
2015–2020	Widespread applications of artificial intelligence, machine learning, and analytics	Artificial intelligence, machine learning	Biotechnology, green technologies, cybersecurity	Artificial intelligence, machine learning, cybersecurity
2020–2025	The growth of cryptocurrencies, blockchain, the development of 5G and the Internet of Things	Blockchain, cryptocurrency platforms	Cryptocurrency Assets, 5G, Internet of Things	Cryptocurrencies, 5G, Internet of Things

Source: structured by the author based on [4; 5; 7; 10; 12]

The study proves the main trends associated with the digitalization of investment processes over the past decades. It includes the causes and consequences of the widespread use of digital technologies in investment, digital investment decision-making tools, investment areas (directions) and global trends. Please note that these trends can overlap and interact, as well as have an impact on other areas and areas of investment.

In the future, digitalization will continue to influence investment processes, allowing companies to use new technologies to increase efficiency and reduce risk. It can also be expected that new industries that are closely linked to digital technologies will continue to grow and provide investors with new opportunities.

The next period 2025–2030 may include trends related to the development of quantum computers, the growth of autonomous vehicles, the development of the metaverse, and the continued integration of artificial intelligence and machine learning into all areas of life. These new technological directions can lead to changes in digital decision-making tools and provide new investment opportunities.

Going forward, investors should keep an eye on these trends and ensure their ability to adapt to change to maximize returns in an ever-transforming environment. Researching global trends and developing digital investment decision-making tools will help identify new opportunities and ensure sustainable development.

Conclusions. Digitalization significantly transforms investment processes, promoting automation, reducing costs and increasing efficiency, but at the same time generates new risks, such as cybercrime. Cybersecurity, regulatory support, and risk analysis are becoming critical elements in ensuring economic security in the context of active digitalization of investment processes. Blockchain and cryptocurrencies present new opportunities for investors, but at the same time require a cautious approach due to the high volatility and uncertainty of the regulatory environment. Investment companies must adapt to the new digital reality, developing strategies that focus on minimizing risks and optimizing the use of digital technologies. Since the technological environment is constantly evolving, it is important to constantly monitor and analyze changes in the field of digitalization of investments, as well as provide training and development of personnel. Further research with a focus on regulatory changes, innovative technologies and risk management strategies aimed at ensuring economic security in the context of digitalization of investments.

REFERENCES:

1. Mayer-Schönberger V. & Cukier K. (2013) Big data: A revolution that will transform how we live, work, and think. Houghton Mifflin Harcourt.
2. Porter M.E. & Heppelmann J.E. (2014) November 2014 How smart, connected products are transforming competition. Harvard Business Review, pp. 65–88.
3. Setiawan I., Kartajaya H. & Kotler P. (2016) Marketing 4.0: Moving from Traditional to Digital. Wiley.
4. Lund S., Manyika J., Woetzel J., Barriball E. & Krishnan M. (2020) Risk, resilience, and rebalancing in global value chains.
5. Luo Y. (2022) A general framework of digitization risks in international business. *Journal of international business studies*, no. 53(2), pp. 344–361.
6. Schwab K. (2017) The fourth industrial revolution. Currency.
7. Tropmann-Frick M. (2023) The Analysis of Reliability and Objectivity of Information That Can Be Found on the Internet. *Information Modelling and Knowledge Bases XXXIV*, vol. 364, p. 183.
8. Negroponte N., Flusser V., Gouveia T., Wright A., Tapia A., Chambel M.I.,... & Gilieson K. (1995) Being Digital Nicholas Negroponte, p. 4.
9. Solis B. (2015) X: The experience when business meets design. John Wiley & Sons.
10. Jenkins H. (2006) Convergence Culture: Where Old and New Media Collide. *Social Science Computer Review*. New York: New York University Press, no. 26(2), pp. 252–254. DOI: <https://doi.org/10.1177/0894439307306088>
11. Castells M. & Blackwell C. (1998) The information age: economy, society and culture. Volume 1. The rise of the network society. Environment and Planning B: Planning and Design. No. 25, pp. 631–636.
12. Kalinin O., Gonchar V. (2022) Management of Investment Security of Enterprises in the Context of Digitalization and Transformation. Management: challenges in global world: monograph / Edited by Mykhailo Sahaidak and Tetiana Sobolieva. Kyiv National Economic University named after Vadym Hetman, pp. 43–67.

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Oleksandr Kalinin, Doctor of Economics, Professor, Kyiv National Economic University Named After Vadym Hetman; Scientific Fellow, Mykolas Romeris University. **Viktoriya Gonchar**, Doctor of Economics, Professor, Kyiv National Economic University named after Vadym Hetman. **Digitalization of investment processes: risk-management and economic security.**

The article discusses the risks and economic security associated with the digitalization of investment processes, including the use of blockchain technologies, smart contracts and robot advisors. The process of digitalization in the investment sphere is analyzed, the main risks are identified. Analysis of the causes and consequences of the widespread use of digital technologies in the field of investment led to the conclusion that digital technologies have

gained great popularity in the investment sphere. The paper identifies strategies for ensuring economic security in the context of digital investments, as well as regulatory aspects and regulatory requirements. A study of trends related to digitalization of investment processes has been carried out, which has revealed changes in the process of making managerial decisions on investment and provides general trends in changes in directions and spheres of investments.

Key words: digitalization, investment processes, risk, economic security, digital technologies

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Діджиталізація інвестиційних процесів: ризик-менеджмент та економічна безпека.

У статті розглядаються ризики та економічна безпека, пов'язані з діджиталізацією інвестиційних процесів, включаючи використання технологій блокчейн, інтелектуальних контрактів та робот-радників. Проведено дослідження основних понять та тенденцій, пов'язаних з діджиталізацією інвестиційних процесів, включаючи визначення діджиталізації та приклади застосування цих понять у реальному світі. Оцінено рівень та характеристика діджиталізації в інвестиційній сфері на сучасному етапі. На основі ідентифікації ризиків доведено, що основними є ризики кібербезпеки, ризики волатильності, ризики фінансових махінацій. Аналіз причин та наслідків широкого застосування цифрових технологій у сфері інвестицій дозволив виокремити загальні причини: ефективність та швидкість, доступність, автоматизація, можливість аналізу великого масиву даних. Серед головних наслідків діджиталізації виокремлено: збільшення обсягу торгівлі, зниження вартості інвестування, вплив на ринкову волатильність, демократизація інвестицій, розвиток фінтех стартапів, збільшення ризику фінансових махінацій. Проаналізовано вплив діджиталізації на інвестиційні процеси та надано тенденції, які призводять до трансформації інвестиційного ландшафту. Аналіз проведено за період 2000–2025 рр. Досліджено цифрові інструменти прийняття рішень щодо інвестування, сфера інвестицій та глобальні тренди. Доведено, що діджиталізація продовжить впливати на інвестиційні процеси. В сучасному періоді основними напрямками інвестицій є біотехнології, зелені технології, кібербезпека, криптовалютні активи та інтернет речей. Прогнозується стрімкий розвиток галузей, які тісно пов'язані з цифровими технологіями. Наступний період 2025–2030 може включати тенденції, пов'язані з розвитком квантових комп'ютерів, зростанням автономних транспортних засобів, розвитком метавесвіту та продовженням інтеграції штучного інтелекту та машинного навчання в усі сфери життя. Ці нові технологічні напрями можуть привести до змін у цифрових інструментах прийняття рішень та забезпечити нові можливості для інвестування.

Ключові слова: діджиталізація, інвестиційні процеси, ризи, економічна безпека, цифрові технології.