

THE ROLE OF ARTIFICIAL INTELLIGENCE IN THE DEVELOPMENT OF THE INSURANCE MARKET

Maksym Dubyna¹, Olha Popelo², Maksym Shvets³

Abstract. Digital transformation of the insurance market is an integral part of the formation of the digital economy and the digitalization of the entire financial services sector. The utilisation of information and communication technologies has become a pivotal aspect of the innovative development of insurance companies in the contemporary era, enabling them to enhance their operational efficiency and ensure their competitive standing. A particularly promising digital technology that insurers are currently developing is artificial intelligence. According to experts in the field, this technology is poised to become a leading solution for these institutions in the near future. This assertion is substantiated by the observed growth in investment resources allocated to the advancement of this technology. This underscores the necessity for conducting scientific research to ascertain the current state of artificial intelligence technology implementation by insurance companies in their operations and to explore prospects for its integration into the broader insurance market development. The purpose of the article is to provide a comprehensive overview of the theoretical and applied provisions of artificial intelligence technologies in the development of the insurance services market. A range of general scientific and special research methods were used in the article, including the following: methods of comparison, measurement, abstraction, analysis and synthesis. The employment of statistical analysis methods enabled the substantiation of the state of artificial intelligence technology utilisation by insurance companies, and the identification of potential areas for its further application in their work. The study of the modern model of the insurance services market was conducted, which was based on substantiating the essence of this model and identifying specific features of the functioning of the specified market. In the future, this allowed to more clearly substantiate the directions of its digitalisation, the prerequisites for the digital transformation of insurance companies, the main digital technologies that they use in their own activities, and the consequences of their application for this market. The article pays significant attention to the study of the essence of artificial intelligence and its modern development in the field of financial services, as well as to the further prospects for its use in the activities of insurance companies. The consideration of specific features of their business activities enabled the formulation of consequences of using artificial intelligence technology in their further work. Advantages and disadvantages of using artificial intelligence technology in the work of insurance companies were specified, which made it possible to state available significant systemic advantages of its use and its prospects for ensuring digital transformation of these companies. In the future, this allowed to substantiate the main directions of using artificial intelligence in the further development of insurance companies and the insurance services market in general.

Keywords: InsurTech, insurance, artificial intelligence, digitalisation, digital technologies, personalisation, insurance services, insurance services market.

JEL Classification: D14, G21

¹ Chernihiv Polytechnic National University, Ukraine

E-mail: maksim-32@ukr.net

ORCID: <https://orcid.org/0000-0002-5305-7815>

Web of Science ResearcherID: F-3291-2014

² Chernihiv Polytechnic National University, Ukraine (*corresponding author*)

E-mail: popelo.olha@gmail.com

ORCID: <https://orcid.org/0000-0002-4581-5129>

Web of Science ResearcherID: I-8572-2016

³ Chernihiv Polytechnic National University, Ukraine

E-mail: msvec1998@gmail.com

ORCID: <https://orcid.org/0009-0006-3793-8408>



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1. Introduction

The development of the insurance market is an integral part of ensuring the effective functioning of the financial system in modern conditions. It is within the framework of this market that the movement of financial resources occurs, their accumulation and transformation into investment funds, which are subsequently directed to the development of the national economy. Empirical evidence from foreign countries demonstrates that the absence of effective market functioning hinders the establishment of favourable conditions for economic development. Consequently, the challenges of identifying novel domains of stimulating activities for insurance companies, attracting new clients to the insurance market, and enhancing the trust of economic entities in the specified institutions are accorded substantial attention by state authorities in developed countries.

In the contemporary era, insurance companies, akin to other financial institutions, are profoundly impacted by digital technologies and are undergoing a digital transformation. These companies are leveraging the capabilities of these technologies in their operations, enhancing the quality of insurance services and optimising the management of various risk types. This, in turn, contributes to their stable functioning and enhances their financial outcomes.

Among all the digital technologies that insurance companies use in their activities today, one of the most promising is artificial intelligence technology. These companies are actively applying elements of this technology, using it to improve the quality of insurance services, risk assessment, financial condition of customers, in the management of insurance companies, improving the quality of analysis of internal and external information. This helps to make balanced and correct management decisions. The potential use of AI in insurance companies has not yet been fully explored, since its potential use is enormous and insurance companies are gradually developing new innovative products and programmes for the application of this technology in their own work. The outlined justifies the importance of carrying out additional research by using AI in the development of the specified companies to determine directions for its development in the insurance services market.

The use of AI is already an objective process in which insurance companies are already obliged to use this technology in their own development in order to ensure their own competitiveness in the insurance services market. However, the scientific work on these issues is fragmentary and insufficient. Therefore, the issue of deepening the theoretical and applied provisions on the use of this technology, describing its role in the digital transformation of insurance companies, advantages and disadvantages of its use is relevant.

2. Literature Review

Scientific studies of domestic and foreign scientists are devoted to the study of the development of the insurance services market in the conditions of digitalisation and rapid development of artificial intelligence technologies. As part of the study (Dalla Pozza, 2024; Fedyshyn et al., 2019), a conceptual basis for the study of issues related to the creation of value for customers by service companies through multi-channel provision of insurance services is proposed. According to the authors, the analysis conducted provides a holistic and managerial view of multi-channel strategies in the context of insurance services. In their analysis, the authors (Yang et al., 2024) examined two distinct categories of social health insurance: the Basic Health Insurance Scheme for Urban Employees and the Basic Health Insurance Scheme for Urban and Rural Residents. The authors concluded that social health insurance can significantly influence the choice of residents of medical institutions. Furthermore, research undertaken by Ranjan (2024) has revealed the potential for synergistic interactions between green bonds and catastrophe insurance markets.

The objective of the present study (Odima et al., 2023) is to analyse the potential utilisation of public health insurance as a micro-medical insurance modality, with a focus on economically disadvantaged populations. The study's findings revealed that, despite limited awareness, a significant proportion of the Nigerian population, specifically 79%, is well informed about public health insurance schemes and actively utilises these services. In a related study, Litvinova et al. (2023) emphasised the importance of ensuring the effective operation and development of insurance companies in the insurance services market, particularly in the context of globalisation and intensifying international competition. In their seminal work, scholars (Zhang et al., 2022) proposed a novel insurance concept aimed at compensating cloud computing clients in the event of specific failures. The authors of the study proposed a solution to the problem of the optimal insurance plan in markets characterised by incomplete information, and conducted a detailed analysis of insurance policies in both cases.

Prokopchuk et al. (2022) conducted a study of the general trends of the functioning of the Ukrainian insurance services market in relation to its transformational features, concluding that insurance contracts, market concentration, and the level of insurance penetration are of particular significance. The authors (Pugnetti et al., 2021) demonstrate that customers have high levels of trust in insurance companies and are open to purchasing additional services, in particular for prevention and assistance.

However, analysis results demonstrate that insurance companies are currently focusing on cost reduction measures.

The objective of the present article (Melnychuk et al., 2019) is to analyse the factors that affect the activity of insurance companies on the insurance services market in the field of life insurance. The authors of the article have identified the factors that influence the development of life insurance on the insurance market. Conversely, the research by Mirko Kraft et al. (2023) focuses on the digitalisation of management accounting and controlling in insurance companies, with a particular emphasis on the influence of big data, artificial intelligence, and blockchain technologies. The present article (Abdusalomova et al., 2022) is devoted to an examination of the ways in which advanced digital technologies can be applied in the activities of insurance companies. The authors analyse the benefits of insurance companies using ICT to improve their activities.

Novović-Burić et al. (2022), Grigoras-Ichim et al. (2018) prove that modern trends in the world market lead to the need for insurance companies to have effective IT solutions in order to deepen the customer base, improve market positions and strengthen financial indicators. Scientists (Das Arijit et al., 2021) believe that the purchase of health insurance is important because medical expenses required for treatment are very expensive today. The authors suggest creating a website that will help people reduce the amount of paperwork to avoid data inconsistencies and fraud to get wrong results.

As posited by Eckert et al. (2020), digital transformation is becoming increasingly significant for the business models of insurance companies. A comprehensive review of digital technologies and their applications in the insurance industry has been conducted by scientists. An additional article (Strønen, 2020) has analysed the driving forces of digital transformation opportunities among Norway's largest banks and insurance companies. The study by Šatrevičs et al. (2019) focuses on the analysis of the digitalisation impact on customers' preferences and the development of strategies by Latvian insurance companies. The authors investigated the development of strategies by insurance companies in the digital transformation era, with a focus on the changing values of customers, employees and owners of insurance companies.

The findings of the study (Acosta-Prado et al., 2024) demonstrate that the implementation of artificial intelligence (AI) in insurance companies enables the transformation of their personal and data-intensive processes into engines of efficiency and knowledge, thereby redefining the manner in which companies in the sector offer their services. The scientific community has demonstrated the immediate benefits of AI in the

insurance sector. A scientific paper (Yahya et al., 2024) has practical implications, studying the characteristics of using artificial intelligence systems for big data analysis about insurance company customers to provide personalised experiences and improve customer interactions.

Tavares Edval da Silva et al. (2024) analyse the barriers that prevent the application of artificial intelligence (AI) and affect its use in the insurance company. Based on the barriers presented by the case and the AI initiatives, the authors explore that the company under study uses AI for automation and execution, rather than using its transformative potential to be an agent of organisational change. A noteworthy study (Resch et al., 2021) examines the impact of artificial intelligence (AI) on leadership in international insurance companies. The research demonstrates that the utilisation of artificial intelligence and its implications for leadership are closely related to the underlying structures of the industry.

A positive evaluation of extant research should acknowledge their importance and relevance. However, it is important to note that further research and thorough analysis are required on the issue of the role of artificial intelligence in the development of the insurance services market.

3. The Insurance Services Market, Peculiarities of its Functioning in the Modern Digital Economy

The insurance services market is defined as the sphere in which financial relations are established between insurance companies and their clients, with the purpose of providing insurance protection to consumers of such services. This results in the movement of funds and the emergence of obligations to provide the specified protection.

The insurance market is a complex macroeconomic system. It is characterised by the presence of a significant number of insurance companies that operate within it. These companies provide voluntary and compulsory insurance services to various categories of clients. In most countries worldwide, the activities of insurance companies are subject to rigorous regulation, given their pivotal role in ensuring the stable functioning of the country's financial system, the social security of its citizens, and the establishment of systemic trust among economic entities in financial institutions. The model of the insurance market is presented in Figure 1.

In contemporary conditions, the insurance market is undergoing development within the digital economy, a process which is determined by the active utilisation of digital technologies. Insurance companies, like the vast majority of financial institutions, play a

significant role in the development of these technologies, which contributes to the digital transformation of both the insurance market and the financial system of the state.

Thus, it can be said that the digitalisation of the insurance market has accelerated significantly in recent years, facilitated by the active participation of an increasing number of insurers in their own digital transformation, which is changing customers' approaches to receiving financial services. Thus, over the presented period, the indicator value is stable, especially for developing markets. Today, it is quite clear that digitalisation is objective for financial institutions, and they are actually forced to join it in order to maintain their own competitiveness.

Figure 2 presents information on the peculiar functioning of the insurance services market in the context of digital economy development.

Within the financial services market, the digitisation of different types of financial institutions is taking place in different ways. This is due to the specificities of their work, their place in the functioning of the financial system and the national economy.

In order to comprehend the economic activity of insurance companies, it is first necessary to consider the nature of the insurance service itself, which in the vast majority of cases is determinative. In this regard, it is recommended to identify the following features:

- Strictly regulated at the legislative level, there are relevant requirements for the financial condition of insurance companies and certain areas of their activities;
- provide a wide range of different insurance services, the specificity of which is determined by the type of insurance companies, which accordingly affects the

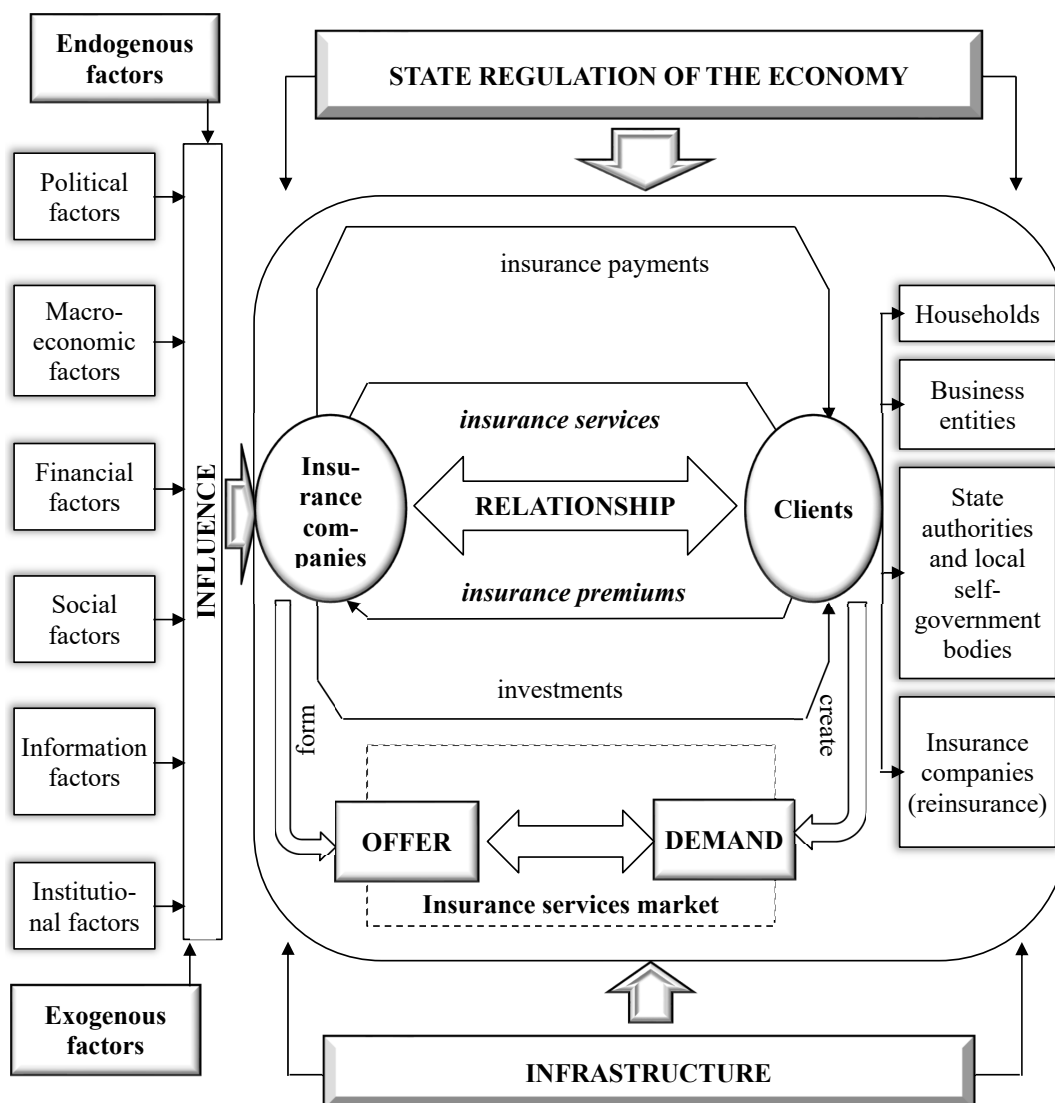


Figure 1. Model of the insurance services market

Source: compiled by the authors

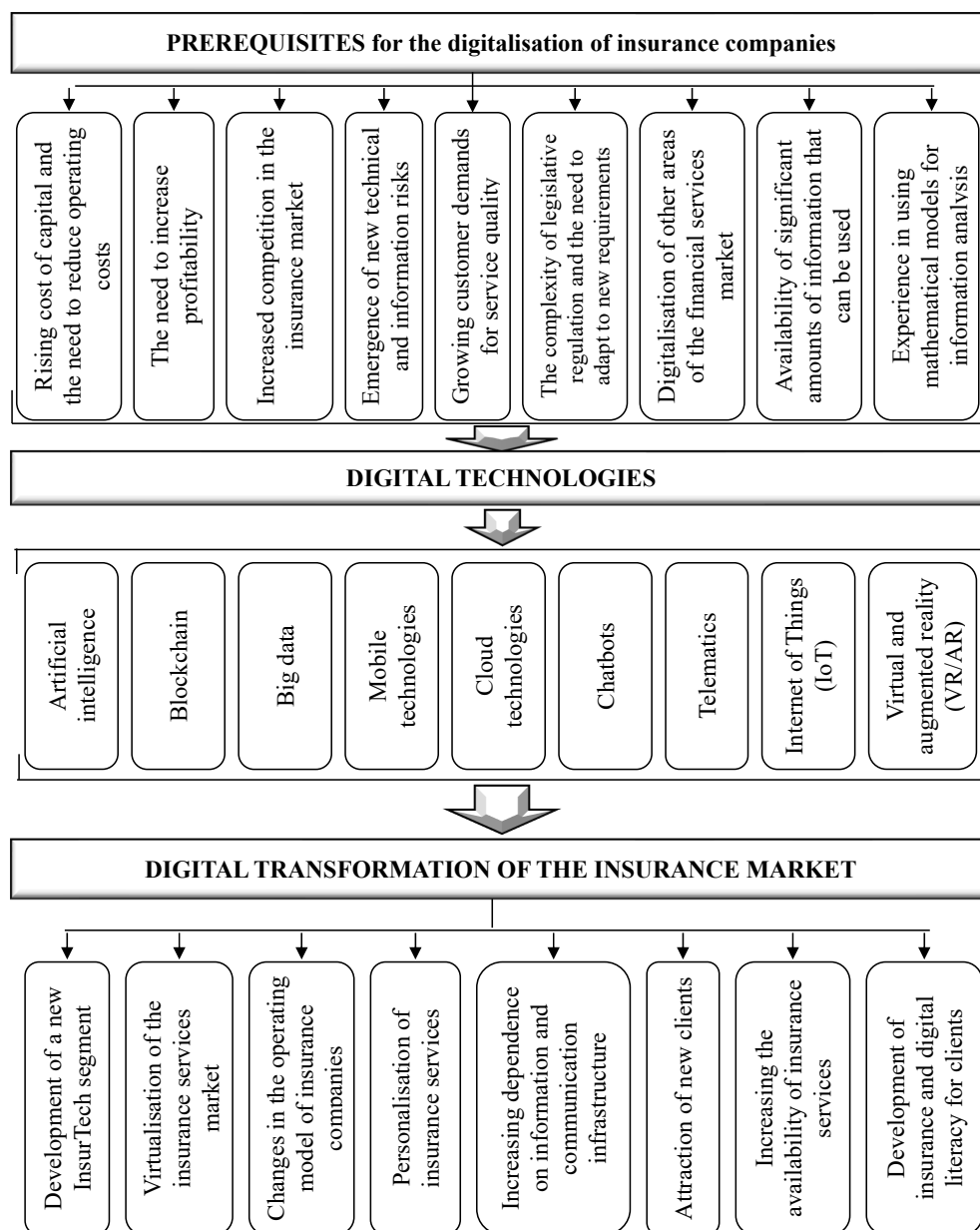


Figure 2. Insurance services market in the digital economy

Source: compiled by the authors

specifics of their economic and financial activities: non-life insurers, life insurers;

- activities involve continuous analysis of possible economic, financial and other risks, their assessment and management;
- related to the need to constantly analyse the behaviour of consumers of insurance companies' services, which is the basis for making decisions on the sale of new insurance products and their terms;
- provide both compulsory and voluntary insurance services. The functioning of insurance companies is also affected by the fact that they are monopolists in the compulsory insurance markets;

- operates in a competitive environment in which there is a significant number of insurers providing similar insurance services to customers, the list of which is determined by the applicable law;
- uses a wide range of methods to manage its own economic and financial risks, and applies reinsurance to reduce its insurance liabilities;
- obligations to invest its own funds in various financial instruments to earn income, part of which is used to form reserves;
- the need to carry out investment activities necessitates construction of appropriate operational processes and involvement of specialists to carry out these activities;

- the need to submit financial statements to the regulator;
- interaction with different types of clients determines urgency of ensuring transparency of the insurance company's activities, its openness, and the reputation formation among consumers of insurance services.

4. Artificial Intelligence: The Essence and Impact on the Development of Insurance Companies

The field of artificial intelligence (AI) encompasses technologies that utilise vast data sets for analysis and employ sophisticated algorithms to carry out tasks that were previously reliant on human intelligence, skills and cognitive processes.

In the contemporary AI landscape, the field is undergoing rapid development and possesses considerable potential for further utilisation, particularly within the domain of economics. The application of this technology is intended to accelerate the development of economic entities, thereby increasing their interest in investing in new and innovative developments and creating new information products based on this technology.

According to GitHub, in 2023, 98 million projects will be created using AI. Exactly, last year, an abrupt increase in demand for this technology was recorded. Minimal activity of developers has been observed since 2010, and a more noticeable development of AI projects began in 2016. According to the McKinsey study, by 2030 the implementation of artificial intelligence may add about 13 trillion USD to the global economy. This projection is made within a timeframe of six years (Pidhayna, 2024).

In 2022, the global AI market was valued at 10.14 billion USD and is expected to grow by 35.6% at a compound annual growth rate to 118 billion USD between 2023 and 2032 (Figure 3).

Data shows that the use of AI will only increase in the future, and its potential applications will only increase. The potential limits of the use of this technology by scientists and practitioners have not yet been determined, which is extremely difficult given that this technology is constantly developing, changing and based on the use of knowledge, the results of its analysis.

In the contemporary context, the urgency of AI is indisputable. Its role in the insurance market is already substantial, particularly in the operations of insurance companies. According to experts' forecasts, this development will only increase in the future. As posited by the Beinsure report, the size of the AI market in insurance is projected to increase from 346.3 million USD to 5.54 billion USD by 2032, growing by 32.9% over the next ten years (Parashchak, 2024; FORINSURER, 2024). It is important to note that there are a number of other forecasts that are even more optimistic. According to Binariks (2024), the global AI market in the insurance sector was valued at 4.59 billion USD in 2022 and is expected to reach 79.86 billion USD in 2032, growing at a compound annual growth rate (CAGR) of 33.06% from 2023 to 2032. Figure 4 presents information on future development of this technology in the insurance market.

However, the leadership in the use of AI will lag behind the countries of North America, where the insurance market is actively developing and insurance companies play an important role in the investment market and in the formation of financial resources for the development of the national economy. Leaders in the adoption of this technology are companies such as Prudential Financial, MetLife and Berkshire Hathaway (Binariks, 2024). European countries have also witnessed a rapid development of insurance, particularly at the expense of less developed countries, such as those in Eastern Europe.

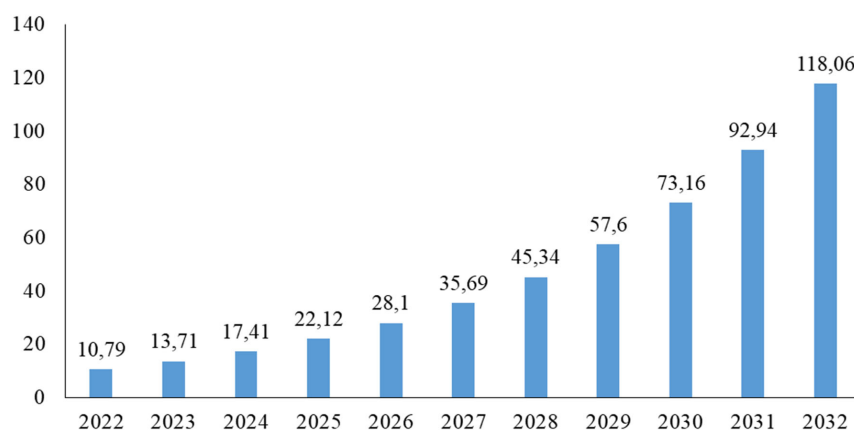


Figure 3. Size of the global market for generative artificial intelligence

Source: Parashchak (2024), FORINSURER (2024)

The forecast data on the AI development in insurance companies' activities presented in Figure 5 is substantiated, given the significant interest of insurers in this technology. Indeed, a considerable number of insurers have already invested in this technology, adapting it to their own business model. A substantial proportion of insurance companies have expressed intentions to augment the allocation of resources towards this field. In 2024, the European Insurance and Occupational Pensions Authority (EIOPA) published the results of a survey of insurers across the EU on the level of AI implementation in the insurance sector. Survey results indicate that 50% of companies providing risk insurance services and 24% of life insurance companies are already utilising AI in their own activities. Furthermore, 30% and 39% of these companies anticipate a further increase in the active development of AI in the insurance sector (EIOPA, 2024).

Insurers seek to derive maximum benefit from the implementation of AI, given the substantial

investment resources required for its integration into operational processes and subsequent support. The primary returns from investments in AI are expected to be increased productivity, increased revenue and cost savings. A substantial proportion of prominent insurance companies (with direct insurance premiums in excess of 25 billion USD) have identified enhanced productivity as the primary factor in the adoption of AI. Furthermore, 65% of insurance companies anticipate revenue growth of over 10%. Furthermore, 52% of respondents anticipate achieving cost reductions of 11-20% (Parashchak, 2024).

5. The Impact of Digitalisation on the Work of Insurance Companies

The specific features of the economic activity of insurance companies, as outlined above, also determine the features of AI use and the directions of its

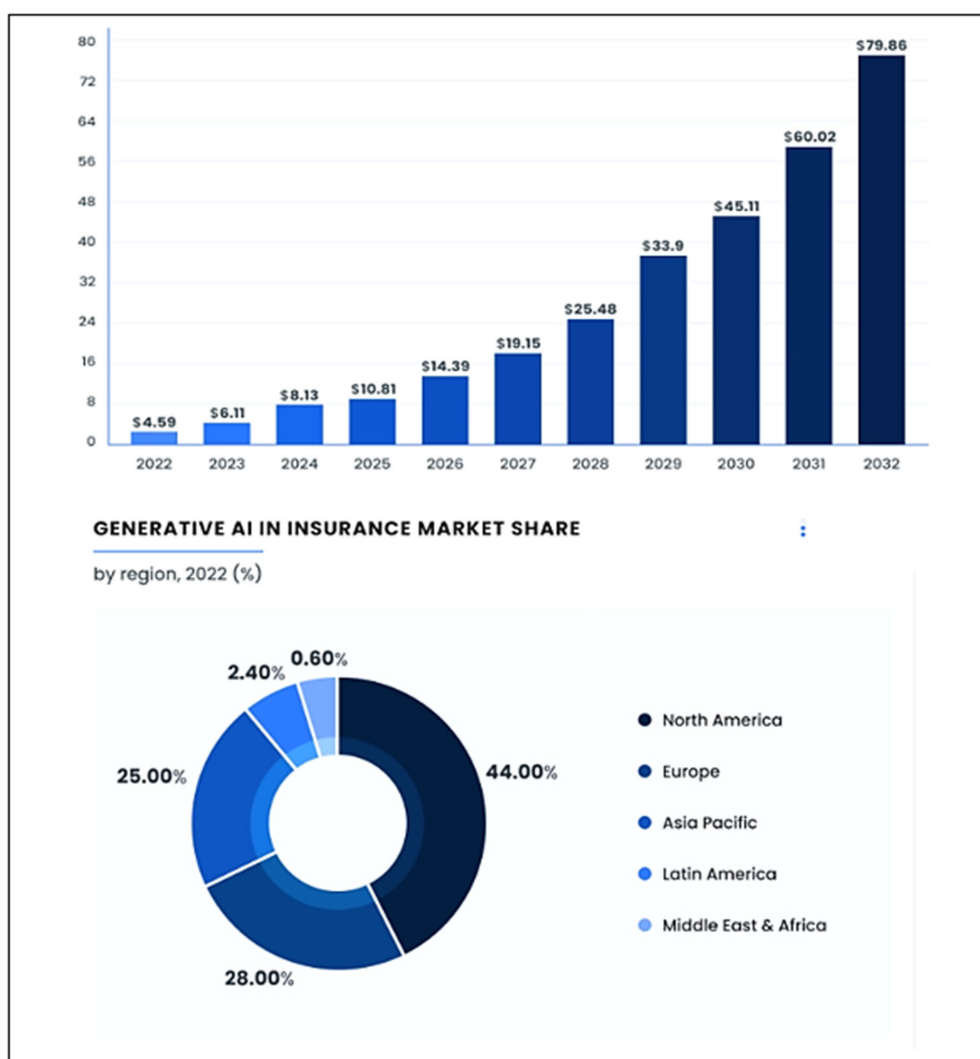


Figure 4. Development of artificial intelligence in the insurance services market

Source: (Binariks, 2024)

application in the work of these financial institutions. Among the aforementioned features, it is important to highlight the following:

- Improving the risk assessment of certain categories of customers by using AI to accumulate more information about such insurance consumers, better process it, and provide it for further decision-making;
- application of AI allows to improve the quality of insurance companies' management and improve existing risk management systems, which has a positive impact on the financial stability of these companies;
- AI allows insurance companies to develop personalised insurance products for different customers, and to interact with banking institutions to improve these products to better meet the overall financial services needs of consumers;
- applications of AI can also improve the quality of customer support, which is already being implemented through the active use of chatbots and virtual assistants;
- AI can significantly accelerate the provision of insurance services, document recognition, and the assessment of potential risks based on primary customer information;
- AI makes it possible to better detect fraudulent actions of customers, analyse the specifics of insurance events and assess the likelihood of receiving false information from insurance consumers;
- allows to better assess the level of damage to real estate and other property based on video recordings, photographs, satellite images, other documents, police reports, and to simulate the situation;
- the active use of AI, its ability to quickly assess potential risks, insured events and provide relevant information to the insurance company, speeds up the payment of insurance compensation, which is also made taking into account the previous model of insurance behaviour of customers;
- based on the individual parameters of different types of consumers, AI can help analyse their financial situation, take into account the insurance history of using the services of an insurance company and offer personalised insurance products;
- AI allows analysing the state of the insurance market in the country, studying competitors' offers, analysing them, and taking into account the information received when creating new insurance products.

As with any technology, AI has advantages and disadvantages for insurance companies. Accordingly, each insurance company must consider the approach of active engagement of this technology in its own activities. Today, no one can give any guarantees why the use of AI is always justified and the results of its applications are correct and without any doubt can be used by all financial institutions. This is due to the fact that today AI in its development is in the initial

stages of its application in insurance companies. Accordingly, in the future the quality of its use will constantly increase, since this technology is constantly being improved, learned in the process of constantly increasing information about the activities of individual insurance companies, their clients, trends in the market of insurance services, historical features of functioning of this market and its role in ensuring economic development of the country.

The purpose of this study is to provide a detailed analysis of the advantages and disadvantages of the application of artificial intelligence by insurance companies.

6. Advantages and Disadvantages of Using Artificial Intelligence in the Work of Insurance Companies

As with any technology, the implementation of AI has both advantages and disadvantages. In the context of insurance companies, the advantages are predominantly associated with enhancing operational efficiency, expanding the client base, diversifying financial services, and, consequently, increasing the volume of insurance premiums attracted. Threats are primarily caused by the specifics of the AI technology itself, so there is an urgent need to ensure the cybersecurity of insurance companies when using it, the need to be able to use it, taking into account all the necessary resources.

In agreement with Olena Zhuravel's perspective, the utilisation of AI is contingent upon the willingness of insurance companies to adopt this technology. The present study investigates the extent to which companies within the insurance industry are prepared to adopt and integrate artificial intelligence technologies. This assessment encompasses evaluating the current technological infrastructure, workforce competencies, data quality, and regulatory compliance. The implementation of AI solutions by insurers is facilitated by AI Availability, leading to enhanced efficiency and improved customer service (Binariks, 2024).

Figure 5 presents the benefits of using AI in the work of insurance companies.

In the authors' opinion, the disadvantages of using this technology in the work of insurers include the following:

- The need to improve the level of cybersecurity of insurance companies, which requires significant financial resources;
- the necessity to improve the skills of employees and train them to use AI in their work;
- the requirement to hire highly qualified personnel to develop mechanisms for implementing and supporting AI in the work of insurers, which requires additional and ongoing financial costs;

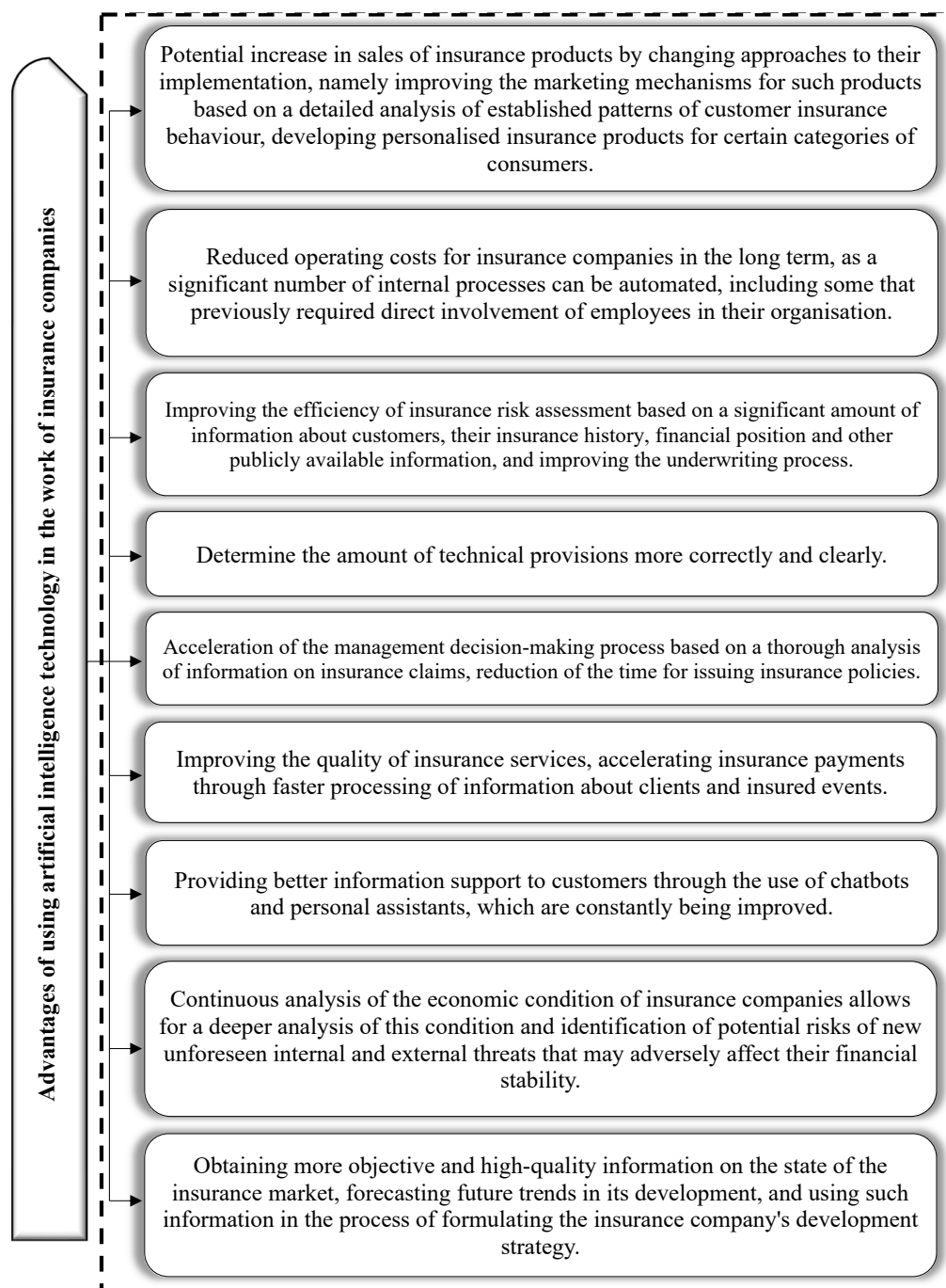


Figure 5. Advantages of using artificial intelligence technology in the work of insurance companies

Source: compiled by the authors

- the use of AI may violate the individual information security of customers, access to their personal data and confidential information, which may also affect the protection of customer rights;
- possible dependence on the use of AI, which will be difficult to minimise in the future if this technology is used inefficiently;
- technological imperfections can also affect the quality of insurance services and information support for

customers who do not trust chatbots and individual virtual assistants enough;

- the responsibility for all erroneous decisions and their consequences related to the use of AI rests solely with the insurance company, which may lead to additional financial costs;
- the development of further legislative regulation of AI in insurance companies may limit the potential for using these technologies and thus affect the

companies' plans for further digital transformation;

- AI does not have empathy and does not take into account human relations, which also affects information processing, but given these factors, informal data is important in the activities of insurance companies (EIOPA, 2021);

- it is necessary to have an appropriate level of insurance literacy among customers and improve their digital skills;

- the ability to develop surveys to obtain feedback from customers on the quality of insurance services, with subsequent automatic processing of the results of these surveys;

- possible discrimination of certain categories of clients and prohibition of selling them different types of insurance products (Lázaro Cuesta Barber, 2024).

7. Artificial Intelligence and the Future of the Insurance Market

Thus, today AI is becoming one of the leading digital technologies actively used by insurance companies to increase their own efficiency and ensure competitiveness in the complex and quite dynamic market of insurance services. In the future, as mentioned above, this technology will continue to develop and adapt to the specifics of the economic activities of insurance companies. It will be combined with other digital technologies in order to achieve the best results from the digitalisation of the specified companies.

Insurance executives noted that the largest investments have already been made in cloud technologies, which is understandable. Accordingly, they plan to invest less in these technologies in the future. At the same time, it is in AI technology that insurance companies plan to invest in the near future. Significant investments are also planned in the automation of operational processes and underwriting. However, it is clear that these areas will evolve in light of AI capabilities. Therefore, it can be argued that the development of AI in insurance companies is also confirmed by the willingness of their executives to invest their own funds in its application.

It is the considered opinion of leading experts in the field of further development insurance that the active involvement of artificial intelligence (AI) is indicative of the following global trends in its applications, as illustrated in Figure 6.

Thus, it can be argued that AI allows creating new impulses for further innovative development of insurance companies, virtualisation of their work based on adherence to principles of personalisation, individualism and transparency. Today, this technology is characterised by a number of risks and threats that can negatively affect the development and functioning of insurance companies. Nevertheless, the advantages of digitalisation, including the utilisation

of AI in the operations of these companies, are also substantial, and their potential exceeds the existing risks associated with the use of this technology. As with other components of the financial services market, AI changes the established model of operation of insurance companies, the process of providing them with insurance services, and thereby shapes directions of digital transformation of the insurance services market.

8. Conclusions

In articles theoretical and applied provisions of AI development in the insurance market services are deepened. The detailed analysis of the essence of this market, features of its functioning are presented, conclusions are drawn on the high level of competition between insurance companies in this market, their existing significant interest in digital technologies are proved, which, in summary, led to significant transformations of the specified market in the conditions of the digital economy.

The article provides a comprehensive analysis of the prerequisites for digitalisation of the insurance services market, the main digital technologies that are currently being utilised by insurance companies in their operations, and the consequences of digitalisation for this market. The analysis determines that insurance companies in modern conditions utilise a substantial range of diverse information and communication technologies, which, when combined, empower them to augment their own efficiency, expand their business, and enhance their competitiveness in the insurance services market. It has been established that in order to implement digital transformation, these companies must possess the necessary financial resources with which to invest in their own activities. Furthermore, they must have the opportunity and ability to ensure the use of digital technologies in their own work.

In the article the essence of AI is specified and participation trends of its use in activities of financial institutions are defined. It was found out that this technology is defined by experts as one of the most important for further development of these institutions and, accordingly, significant growth of investments in use of this technology, its adaptation to functioning of individual financial institutions, including insurance institutions companies is predicted. Also centres of active development of AI in action insurance companies in countries of North America and Europe are found out.

It was also found that the use of AI allows for the formation of both significant advantages for the work of insurers, and its use is accompanied by an existing set of certain threats. On the other hand, it was established that the advantages of using AI

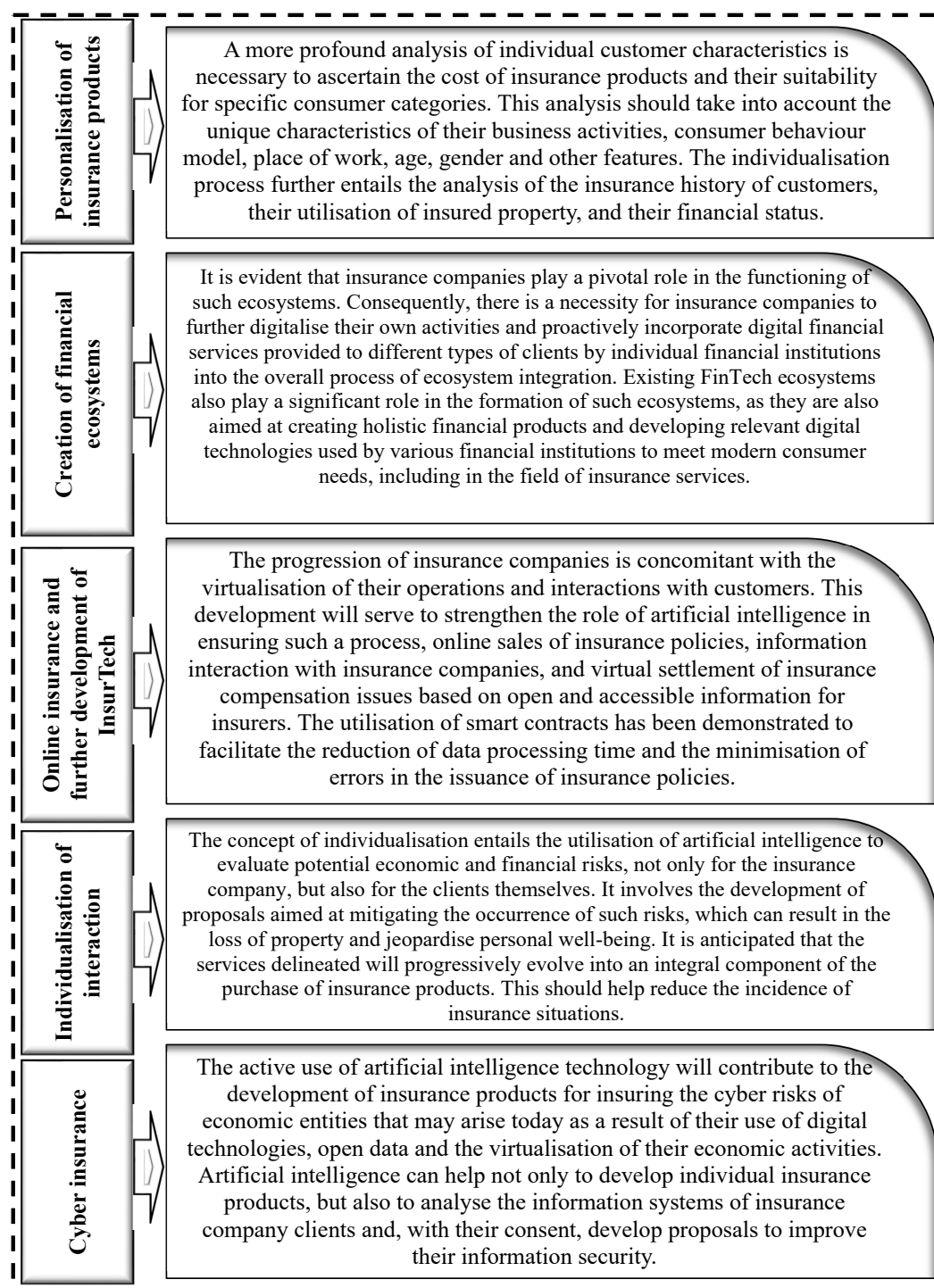


Figure 6. The role of artificial intelligence in the future development of the insurance market

Source: compiled by the authors

in the work of insurance companies exceed the existing threats, taking into account the fact that this technology, if used correctly, allows for minimising certain threats. The same position is confirmed by the opinion of experts, individual heads of insurance companies, who confirm the urgent need to invest in the development of this technology. Based on this,

the article also substantiates future promising areas of active use of AI by insurance companies, which ultimately forms the digital transformation model of the insurance services market. Among these areas, the following are highlighted: personalisation of insurance products, creation of financial ecosystems, online insurance and further development of

InsurTech, individualisation of interaction between insurance companies and their customers, cyber insurance.

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