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Digital Transformation of Insurance Industry: Implications of AI Tools Integration

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ABSTRACT

The relevance of the issue under consideration is driven not only by the rapid development of technology but also by the growing need for automation and personalization of insurance products. The main purpose of this article is to analyze the prospects and problems of integrating AI into insurance services. The article aims to identify the main directions of implementing AI technologies in risk management, optimizing insurance products, as well as studying the legal, ethical and technical aspects of this transformation. During this study, the following general scientific methods of cognition were used: literature synthesis, statistical data analysis, expert assessment, systematization and generalization for segmentation, dynamics assessment, factor classification and formation of a comprehensive vision of the integration of artificial intelligence into insurance services. The results of the expert survey and analysis of the obtained ratings on the integration of artificial intelligence into insurance services showed that for Group I the most significant factors are improved underwriting (Total A2 = 1.35) and predictive analytics (Total A5 = 1.35), while Group 2 prefers automation of repetitive tasks (Total AI = 1.35) and optimization of claims management (Total A3 = 1.0). Among the main problems for Group 1 are regulatory restrictions (Total D3 = 1.5) and data quality (Total DI = 1.8), while Group 2 highlights privacy risks (Total D6 = 1.35) and high implementation costs (Total D8 = 1.0). The integration of artificial intelligence into the insurance sector opens up new opportunities for modernizing processes and improving the efficiency of insurance companies. The results of the study confirm that AI is the main tool for optimizing the management aspects of insurance activities. Therefore, the successful integration of artificial intelligence into insurance activities requires a systematic approach to current challenges, which will allow to maximize the potential of AI within the insurance industry.

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Artificial Intelligence (AI) is now an integral part of the development of many industries, including financial services and insurance. The volume of global artificial intelligence (AI) in the insurance market amounted to USD 4.59 billion in 2021. In 2022, it is projected to reach approximately USD 79.86 billion. By 2032, growing at a compound annual growth rate (CAGR) of 33.06% from 2022 to 2032 (Zhuravel, 2024). This indicates great prospects for the integration of AI technologies in this area and their ability to transform traditional insurance services. The KPMG Insurance CEO Outlook 2023 also emphasizes a significant degree of confidence in AI, with 58% of insurance executives confident in achieving a return on investment within five years (Scattaglia et al., 2023) (Figure 1).

Figure 1

Prospects for Achieving a Return on Investment in AI in Insurance Over the Next Five Years, According to a KPMG Survey



Source: Scattaglia et al. (2023)

Given this, the integration of AI into insurance services presents both significant potential for process optimization and numerous challenges that require detailed analysis. The relevance of this issue is driven not only by the rapid development of technology but also by the growing need for automation and personalization of insurance products. AI has the potential to significantly change approaches to risk management, data analysis, application processing, and customer experience. At the same time, such a transformation involves addressing a number of ethical, legal, and technical issues related to the implementation of AI in the insurance sector. Accordingly, researching the prospects and challenges of integrating AI into the insurance industry is relevant from the point of view of forming sustainable, effective, and safe mechanisms for providing insurance services in the near term.

The purpose of this scientific article is to provide a comprehensive analysis of the prospects and challenges of integrating artificial intelligence into insurance services. The article aims to characterize the main directions of implementing AI technologies in risk management, identify ways to optimize insurance products, as well as analyze the legal, ethical and technical aspects of this transformation.

Literature Review

In the modern era, the integration of Artificial Intelligence (AI) technologies into insurance services is revolutionizing the industry by increasing operational efficiency, improving customer service, and providing personalized offers. Such shifts are steadily developing due

to the insurance industry's tendency to qualitative transformations, as an example, the creation of Insur-Tech has encouraged insurance business representatives to use fundamentally new technological solutions in the insurance sector to enhance competitiveness, qualitative implementation of innovative products, increase customer satisfaction, and improve business activity (Marangwanda et al., 2025; Widyani, 2023). Ahmad et al. (2025) note that Insur-Tech has many potential applications throughout the full product life cycle, from initial research and development to post-contract administration, back-office processes, and risk management. AI applications span various insurance sectors, including health, automobile, and property, fundamentally changing risk assessment, claims processing, and fraud detection (Kuppan et al., 2024). AI provides automated analysis of large data sets, underwriting optimization, accelerated claims settlement, and increased accuracy of actuarial calculations (Parveen, 2024). Intelligent algorithms and machine learning reduce information asymmetry, minimize fraud risks, and increase the efficiency of insurance portfolio management, which contributes to the sustainable development of the industry (Eling et al., 2022). However, outdated regulatory requirements and the complexity of insurance systems impede the digitalization of the industry, in particular due to confusing policy terms, numerous exclusions, and unstructured information, which can be solved by using Natural Language Processing (NLP) and semantic analysis technologies that automate the processing of insurance documents, eliminate ambiguity, detect fraud, and optimize processes, increasing the efficiency of policy management (Kolambe & Kaur, 2024). It should be noted that the AI insurance market is currently segmented by different programs, each of which brings certain benefits and transforms various aspects of the insurance industry (Wilkinson et al., 2024). Therefore, to determine the role of artificial intelligence technologies in the insurance market, Table 1 classifies and categorizes key technological advances based on a synthesis of the literature.

Table 1

Segmentation Criteria	Categories	Description	Examples		
	Underwriting	AI analyzes vast amounts of data quickly, improving risk assessment accuracy and speed	Predictive analytics, risk modeling, automated scoring		
By Application	Fraud Detection	Machine learning algorithms identify unusual patterns, flagging potential fraudulent activities	Anomaly detection, pattern recognition, and real-time alerts		
	Claims Processing	AI automates the claims process, reducing the time and effort needed to handle claims	Chatbots, automated documentation, instant approvals		
	Customer Service	AI enhances customer interactions, providing instant responses and personalized experiences	Virtual assistants, chatbots, personalized recommendations		
By Deployment Mode	On-Premises	AI solutions are deployed within the company's infrastructure for better control and security	Custom AI systems, dedicated		
	Cloud-Based	AI solutions are hosted on cloud platforms, offering scalability and cost-effectiveness	SaaS AI tools, cloud-hosted analytics platforms		

Segmentation of the Artificial Intelligence Insurance Market

Segmentation Criteria	Categories	Description	Examples	
By End-User	Large Enterprises	Big companies lead in AI adoption due to resources and data volume	Major insurance firms, multinational companies	
	Small and Medium Enterprises (SMEs)	SMEs leverage AI to enhance operations and compete with larger players	Regional insurers, niche market players	
By Technology	Machine Learning	Algorithms learn from data to make predictions and decisions	Predictive models, recommendation engines	
	Natural Language Processing (NLP)	AI understands and processes human language	Chatbots, sentiment analysis, automated reporting	
	Computer Vision	AI interprets and processes visual information	Image recognition for claims, and document verification	

Source: Compiled by the authors based on: Dhieb et al. (2020); Eling et al. (2022); Fajri et al. (2025); Kolambe & Kaur (2024); Kumar (2024); Kuppan et al. (2024); Mirza & Iqbal (2024); Parveen (2024); Patil et al. (2024); Qudus (2025); Singh et al. (2024); Srinivasagopalan (2022); Tumanyan & Harutyunyan (2024); Wilkinson et al. (2024)

The developed segmentation is supported by the work of many other researchers in the field of AI. Kumar (2024) notes that AI algorithms allow insurers to create more accurate risk profiles, enabling personalized pricing based on individual health and lifestyle factors. Patil et al. (2024) note that AI-powered Humanoid Chatbots improve the quality of customer service by providing human interaction. This can increase customer satisfaction and optimize processes. Furthermore, automated AI-based systems can minimize query processing time and error rates, which increases operational efficiency (Dhieb et al., 2020; Kumar, 2024; Mirza & Iqbal, 2024; Parveen, 2024; Qudus, 2025) and can identify suspicious activity, protecting insurers and policyholders from unforeseen and unauthorized financial losses (Eling et al., 2022; Kumar, 2024; Kuppan et al., 2024; Singh et al., 2024; Srinivasagopalan, 2022). Tumanyan and Harutyunyan (2024) highlight the potential for AI to drive dynamic pricing and customized insurance packages, which would improve customer acquisition and retention. Fajri et al. (2025) emphasize that AI's ability to process large amounts of data can increase access to insurance products for micro- and ultra-micro enterprises. This can increase their risk resilience and promote sustainable growth.

Given the above achievements, it is worth noting that issues such as data privacy, algorithmic bias, and regulatory compliance remain critical for the successful integration of AI into insurance services (Ibrahim et al., 2025). Umar and Reuben (2025) noted in their work that algorithmic AI-models in insurance contain structural biases that cause discriminatory treatment of certain categories of customers. According to the researchers, this raises the issue of integrating mechanisms to ensure algorithmic integrity and implies compliance with rules and ethical standards, as well as the implementation of transparent machine learning methods with strict adherence to data confidentiality. According to the conclusions of Balogun et al. (2025), the challenges of implementing AI-technologies in insurance services are determined by the urgent need to develop ethical standards and legal mechanisms, as they can ensure the transparency of algorithms, protect confidential data and prevent manipulation. These factors are, first, critically important for increasing customer trust and, secondly, for optimizing insurance processes. According to Arsyad et al. (2025), the main challenges in the modern world are threats to transparency and data security, as well as the need for regular audits of algorithms, prevention of bias in decision-making and the risk of conflict between AI and regulatory requirements, which complicates its integration into financial processes. That is,

the balance between innovation and ethical practices is of critical importance for the further sustainable development of this industry.

Method

The following methods were used in the study:

- synthesis of literature sources was used to segment the insurance market of artificial intelligence;

- analysis of statistical data was used to characterize the dynamics of the development of the artificial intelligence market in insurance services, as well as to assess the readiness of insurance companies to integrate these technologies;

- the expert evaluation method was used to quantify the current prospects and challenges of integrating artificial intelligence into insurance services;

- the method of systematization was used to organize and classify the data obtained by the criteria and weight of the factors influencing the integration of artificial intelligence into insurance services;

- the generalization method was used to process the results of expert assessments to form a general picture of the prospects and challenges of integrating artificial intelligence into the insurance industry.

Results

The intensification of digital transformations in the insurance industry necessitates the integration of advanced technologies, including AI, as a means of optimizing operational processes and increasing the competitiveness of insurance companies. Currently, AI is a key factor in modernizing underwriting, risk assessment, insurance claims processing, and personalized customer service, which contributes to a significant increase in the efficiency of the insurance market. The main areas of AI application in the insurance sector are shown in Figure 2.

Figure 2

Areas of Application of Artificial Intelligence in the Insurance Sector



The main areas of application of artificial intelligence in the insurance sector include data analytics, machine learning, natural language processing, fraud detection, legal information summarization, computer vision, regulatory compliance assessment, financial investment management, sales automation, and improved customer interaction. Thus, considerable attention is paid to document flow automation technologies, which are critical for speeding up the processing of insurance claims and increasing the efficiency of financial transaction processing. The use of artificial intelligence in loss forecasting and financial planning allows optimizing resource allocation strategies, which has a positive impact on the resilience and adaptability of insurance companies in changing economic conditions.

Thanks to its ability to analyze large amounts of data, identify patterns, and predict potential risks, artificial intelligence is shaping new approaches to management decision-making based on analytical models, which reduces the subjectivity of assessment and minimizes financial losses. Integration of AI into insurance is a strategic direction of industry development, which leads to its adaptation to a changing environment and facilitates the creation of innovative insurance products tailored to individual consumer needs. This is mainly due to the projected positive dynamics of AI technology development in the insurance market, as shown in Figure 3.

Figure 3





Source: Compiled by the authors based on Zhuravel (2024); Artificial Intelligence (AI) in Insurance Market Size, Share, and Trends 2024 to 2034 (2024)

The analysis of the insurance AI market dynamics shows its exponential growth in 2022–2034. According to these data, in 2022, the market was estimated at USD 4.59 billion. However, in 2024, this figure increased to USD 8.13 billion. This indicates a significant increase in investment and the introduction of innovative solutions. The forecast data demonstrates steady growth, reflecting the increased confidence in AI solutions in insurance, as well as their ability to optimize insurance processes. The period from 2025 to 2030 is particularly illustrative, when the market size is expected to increase from USD 10.81 billion to USD 45.11 billion. This is due to the expansion of artificial intelligence, increased automation, and the integration of advanced machine learning algorithms. Growth is expected to continue beyond 2030, reaching USD 141.44 billion in 2034. This confirms the long-term trend towards the transformation of the insurance sector under the influence of artificial intelligence. However, it should be noted that the regional structure of the insurance services market is characterized by a high concentration of AI technologies in developed countries (Figure 4). This means that the uneven distribution of technological potential between regions

currently determines the future prospects for the development of AI in the insurance sector and the need to adapt regulatory strategies to the specifics of each of these markets.



Figure 4

Regional Structure of AI Development in the Insurance Market

Source: Zhuravel (2024)

The analysis of the market structure shows that in 2022, North America held the leading position, covering 44% of the global AI insurance market, driven by the activities of key players in the insurance sector, including Prudential Financial, MetLife, and Berkshire Hathaway, as well as the high level of digitalization of the industry and the demand for innovative insurance solutions. The European region ranks second, accounting for 28% of the total volume. Its development is driven by the high level of integration of digital technologies in insurance activities, as well as legislative support for cybersecurity and digital transformation of financial services. The Asia-Pacific region shows the highest growth dynamics, covering 25% of the market. The main factors behind this development are rapid population growth, the expansion of the middle class, and the growing demand for affordable insurance products. Government support for innovative technologies in the financial sector contributes to the active implementation of AI in insurance services. Latin America (2.4%) and the Middle East and Africa (0.6%) have a relatively low market share, due to limited access to high technology, regulatory barriers, and a lower level of digital transformation in the insurance sector. At the same time, further growth is possible with increased investment and the development of regulatory frameworks in the insurance technology sector.

Considering the prospect of widespread integration of artificial intelligence into insurance services, a more localized important step in studying their strategic and operational capabilities in the context of digital transformation is to analyze the readiness of insurance companies to integrate AI technologies. In particular, Zhuravel (2024) presents the results of an assessment of insurers' readiness to integrate artificial intelligence in key aspects covering strategic orientation, investment in resources, function engineering, training, and model management (Figure 5). The assessment is based on a five-point scale that covers the degree of readiness of companies, ranging from highly prepared to initial stages of consideration or no action. The results indicate that there is moderate readiness in strategic planning and resource investment (11% and 17%, respectively), while the largest number of respondents

(37%) showed an initial stage of preparation in function engineering and model management (Zhuravel, 2024). Such statistics indicate that most organizations are currently only considering the potential of AI or are at the stage of experimentation, which confirms the gradual but necessary process of integrating technologies at different levels of the business (Figure 5). In this context, understanding the degree of readiness of organizations to implement innovative solutions allows us to assess the prospects for the industry development and identify the main factors that affect the efficiency of using AI to optimize products, services, and internal processes.

Figure 5

Degree of Readiness of Insurance Companies to Integrate Artificial Intelligence Technologies into Insurance Business Management



Source: Zhuravel (2024)

The analysis of the presented data indicates that the use of AI technologies in insurance is a fundamental factor ensuring the sustainable development of the industry. In particular, such growth in this market is driven by the development of algorithmic models, improvement of technological infrastructure, and changes in approaches to risk management, which further strengthen the position of artificial intelligence as a key driver of the insurance sector's evolution. However, current challenges, such as potential errors in data processing, including the generation of non-existent or false information, emphasize the need to engage qualified professionals to verify the results generated by AI or use other systems of deterrence and control; the possibility of discrimination arising from the bias of models based on historical data requires careful review of processes and the development of specialized tools to avoid violations of equality and ensure transparency in the provision of insurance products.

In our study, we assessed the current prospects and challenges of integrating artificial intelligence into insurance services by comparing the opinions of two groups of experts: academic researchers in the field of technology and AI (Group 1 = 17), including professors, associate professors, doctors of philosophy and doctors of science in computer science, artificial intelligence, machine learning and data analytics aged 35 to 55 with at least 5 publications on the relevant topics; insurance industry management and strategy specialists (Group 2 = 22), including directors, senior executives, middle and senior managers with management experience in insurance organizations aged 30 to 50 with at least 7 years of experience in the relevant position. Based on the quantitative data obtained, a comprehensive assessment of the insurance industry's readiness to integrate artificial intelligence was formed,

including the identification of key factors that affect the effectiveness of technology implementation, as well as proposals for strategic steps to overcome challenges and realize the potential of AI in insurance services. The main objectives of the analysis are:

I. Based on expert assessments, determine the significance of positive and negative factors influencing the integration of AI into insurance services. At the last stage, an assessment is carried out, where the value from 0 to 3 points is low efficiency; from 4 to 7 points - medium efficiency; from 8 to 10 points - high efficiency.

Based on the results of the analysis of the prospects and challenges of integrating artificial intelligence into insurance services, an expert assessment of the prospects for integrating such technologies was made by two groups of specialists (Table 2). The summary results of the assessment of the prospects for integrating AI into insurance services are shown in Figure 6.

Table 2

Assessment of the	Prospects j	for	Integrating	Al	' into	Insurance	Services
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Criteria	Weighting factor	Group 1	Group 2	Total Group 1	Total Group 2
Automation of repetitive tasks (A1)	0.15	7	9	1.05	1.35
Improve underwriting and risk management (A2)	0.15	9	8	1.35	1.2
Optimize claims management (A3)	0.1	8	10	0.8	1
Personalized customer experience (A4)	0.1	6	9	0.6	0.9
Predictive analytics and proactive outreach (A5)	0.15	9	7	1.35	1.05
Hyper-personalized product development (A6)	0.1	8	10	0.8	1
Data fragmentation and integration (A7)	0.1	10	9	1	0.9
Developing talent and capabilities (A8)	0.05	8	10	0.4	0.5
Transforming the insurance value chain (A9)	0.1	7	8	0.7	0.8

Figure 6

Results of Assessing the Prospects for Integrating AI into Insurance Services



Experts in the first group (Group 1 = 17), which includes academic staff in the field of technology and artificial intelligence, determine that the most significant factors are improved

underwriting and risk management (Total A2 = 1.35), due to the high level of algorithmic analysis and machine learning that minimize the likelihood of errors and increase the accuracy of risk assessment; Predictive analytics and proactive customer outreach (Total A5 = 1.35), which is explained by AI's ability to predict consumer behavioral patterns and automatically adjust insurance offers in accordance with changing conditions. The criteria of data fragmentation and integration (Total A7 = 1.0) and automation of repetitive tasks (Total A1 = 1.05) also received high scores, which is explained by the need to reduce operational workload and speed up the processing of insurance requests. At the same time, Group 1 has the lowest weight among the evaluated aspects in the development of staff talents and abilities (Total A8 = 0.4), due to the limited current capabilities of AI in the field of personal development and training.

In turn, representatives of the second group of experts (Group 2 = 22), including insurance industry management and strategy specialists, gave the highest scores to the criteria of automating repetitive tasks (Total A1 = 1.35), personalized customer interaction (Total A4 = 0.9), and optimizing claims management (Total A3 = 1.0), reflecting the growing importance of an individual approach in insurance products and automated communications. At the same time, the criterion of developing staff talents and abilities received the minimum weight within the second group (Total A8 = 0.5), which indicates a lower level of expectations regarding the direct impact of AI on the HR policy of insurance companies. Thus, the integration of AI technologies into insurance services is mostly positively assessed from both the technological and managerial perspectives, although the priority of certain aspects varies significantly depending on the profile of the experts.

II. To present the dynamics of the key challenges of artificial intelligence integration for the insurance market (Table 3). Visualization of the generalized results is presented in Figure 7.

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Assessment of the Challenges of Integrating AI into Insurance Services

Criteria	Weighting factor	Group 1	Group 2	Total Group 1	Total Group 2
Data quality and impact on decision accuracy (D1)	0.2	9	7	1.8	1.4
Discrimination of algorithms in insurance processes (D2)	0.1	9	8	0.9	0.8
Regulatory restrictions and their impact on AI adoption (D3)	0.15	10	6	1.5	0.9
Gaps in staff skills for AI integration (D4)	0.05	7	10	0.35	0.5
Ethical issues of non-transparent algorithms (D5)	0.1	9	6	0.9	0.6
Data security and privacy risks (D6)	0.15	8	9	1.2	1.35
Reduction of human control in decision-making processes (D7)	0.05	6	8	0.3	0.4
High costs of technology implementation and support (D8)	0.1	9	10	0.9	1
Long-term adaptation of existing systems to AI technologies (D9)	0.1	8	10	0.8	1





Based on the results of the analysis of the challenges of integrating artificial intelligence into insurance services, Group 1 experts determine that the main barriers are regulatory restrictions and their impact on the implementation of AI (Total D3 = 1.5), data quality issues that affect the accuracy of decisions (Total D1 = 1.8), and ethical aspects of the opacity of algorithms (Total D5 = 1.9). The least significant challenges, in their opinion, are the reduction of human control in decision-making processes (Total D7 = 0.7) and gaps in staff skills (Total D4 = 0.35), which is primarily due to expectations of rapid adaptation of specialists to new technologies and the ability to create interpretable decision support systems. At the same time, Group 2 experts pay the most attention to data security and privacy risks (Total D6 = 1.35), as information leaks in the insurance sector can lead to significant financial losses and legal consequences. Experts also highlight the high costs of implementing and maintaining AI solutions (Total D8 = 1.0) as a key barrier due to the need to modernize infrastructure and engage specialized specialists. The issue of the duration of adaptation of existing systems (Total D9 = 1.0) remains important, due to the complexity of integrating new algorithms into traditional insurance processes. Less attention is paid to the discrimination of algorithms (Total D2 = 0.8) and regulatory restrictions (Total D3 = 0.9), which indicates their focus on practical aspects of implementation, where operational and financial factors play a major role. The generalized results demonstrate certain differences in the views of the groups of experts due to differences in their professional approaches. Academic experts focus more on the methodological and regulatory aspects of AI integration, while insurance industry managers emphasize financial and operational challenges. Therefore, it is necessary to emphasize the need to develop a comprehensive approach to the implementation of artificial intelligence that will take into account both technical and strategic aspects of its application.

Discussion

The analysis of the results of our study on the integration of AI technologies into insurance services showed significant trends that are consistent with the scientific views reported in the literature. Comparison of the findings of the two groups of experts showed that data fragmentation and integration (Total A7 Group 1 = 1.0; Total A7 Group 2 = 0.9) were also highly rated. This is in line with the views of Kumar (2024) and Kolambe and Kaur (2024), who emphasize the importance of processing large amounts of data and eliminating

unstructured information to improve performance in insurance companies. According to our research, the use of AI technologies significantly reduces the time to process a request and the number of errors. It also optimizes the management of an insurance policy. In addition, during the analysis, we found that indicators related to the automation of repetitive tasks (total indicator A1, group 1 = 1.05; total indicator A1, group 2 = 1.35) and personalized interaction with the client (total indicator A4, group 1 = 0.6; total indicator A4, group 2 = 0.9) received high expert ratings. These findings are consistent with the study by Patil et al. (2024), which states that automated AI-powered systems significantly improve the quality of customer service and optimize the internal processes of insurance companies. The predictive ability of AI-based technologies to adapt and personalize based on individual customer needs is also a positive factor influencing the insurance activities of companies, as noted by Kumar (2024).

One of the main challenges is the issue of data privacy and algorithmic bias, which remain critical to the effective integration of AI in the insurance sector. This is also supported by the findings of studies such as Ibrahim et al. (2025), which emphasizes the need for strict adherence to privacy standards. Our peer review results also indicate low scores for algorithm transparency and bias in the group of insurance industry management and strategy professionals (Total D2 Group 2 = 0.8; Total D5 Group 2 = 0.6). In addition, structural biases in AI algorithms have been noted as a serious problem in works such as Umar and Reuben (2025), which is supported by the results, where the use of algorithmic fairness and adaptation to ethical standards is important to ensure fairness and reliability of processes. This is also reflected in the scores of the criterion of reducing human control in decision-making processes (Total D7 Group 1 = 0.3; Total D7 Group 2 = 0.4), which indicates the importance of having qualified personnel who can work with algorithmic processes without creating biases. According to Balogun et al. (2025), the need to develop ethical standards and legal mechanisms that can ensure transparency in the use of AI technologies is important to overcome barriers to the adoption of such technologies. This is confirmed by our results, where the critical aspects for Group 1 are the issues of ethical standards and legal mechanisms that contribute to improving customer trust and market stability (Total D5 = 0.9).

Data privacy and algorithm bias issues still remain the most critical for the effective integration of AI into the insurance sector. Such issues were also identified as the most critical in the work of Ibrahim et al. (2025), who emphasize the need for strict adherence to confidentiality standards. Our expert assessment results also indicate low scores for algorithm transparency and bias in the group of specialists in management and strategy of the insurance industry (overall D2, group 2 = 0.8; overall D5, group 2 = 0.6). This indicates the significant weight of these issues in the overall set of challenges faced by the insurance sector. In addition, the work of Umar and Reuben (2025) mentions the issue of structural shifts in artificial intelligence algorithms. This is reflected in our scores for the criterion of reducing human control in decision-making processes (Total D7 Group 1 = 0.3; Total D7 Group 2 = 0.4), indicating the importance of having qualified personnel who can work with algorithmic processes without creating additional biases. According to et al. (2025), the need to develop ethical standards and legal mechanisms that can ensure transparency in the use of AI technologies. Thirdly, our results confirmed the criticality of the issue of ethical standards and

legal mechanisms for Group 1, which contribute to increasing customer trust and market stability (Total D5 = 0.9).

Conclusion

AI can be used in the insurance industry to improve processes and efficiency. The study results indicate that AI is a key tool for improving insurance activities, such as underwriting, risk assessment, claims processing, and personalized customer service. The projected growth of the AI market in insurance indicates a steady increase in investment in this area, reflecting the growing trust in technology and its ability to change the way we think about financial losses. There are still significant challenges to be overcome, including the need to overcome the uneven distribution of technological potential between different regions and to adapt regulatory strategies to new conditions. An assessment of insurance companies' readiness to integrate AI revealed that most insurance companies are at the initial stages of implementing these technologies. Infrastructure development, staff training, and regulatory support are important to ensure the efficient and fair use of AI in the industry. There are several challenges, including the possibility of data processing errors, model bias, and the need to create new mechanisms to monitor the compliance of technologies with applicable laws. In a rapidly changing technological and regulatory environment, the use of AI in insurance services requires constant monitoring and adjustment. The successful integration of AI into insurance activities requires a systematic approach to addressing these challenges. This approach will maximize the potential of AI in the industry and ensure the sustainable development of the insurance industry.

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