

# INTEGRATION OF ARTIFICIAL INTELLIGENCE INTO THE CORPORATE MANAGEMENT SYSTEM

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**Abstract.** The article examines the potential of Artificial Intelligence (AI), with a focus on Machine Learning (ML) and Deep Learning (DL), in the domain of corporate management. A review of the literature and existing practices reveals that AI has the potential to significantly transform traditional business processes, enhance decision-making efficiency, and provide corporations with substantial competitive advantages in the market. The main goal of this study is to analyse some options for integrating artificial intelligence into the corporate management system, to explore the impact on the quality of management decisions, and to identify the main disadvantages and threats of using artificial intelligence models in corporate management. The following methods were used in the research process: literature review and systematization of knowledge, empirical analysis, case study and optimization method. The study in question provides a detailed examination of the application of Machine Learning (ML) and Deep Learning (DL) in a number of key areas of corporate management, including shareholder relations, forecasting, process optimization, risk management, and human resources management. A key finding of the study is that AI enables companies to gain deeper insights into their customers, markets, and internal processes through data analysis. This, in turn, facilitates the development of personalized products and services, optimization of marketing campaigns, and enhancement of customer loyalty and stakeholder understanding. However, the authors of the article also highlight several challenges associated with the implementation of AI, including: data quality (the effectiveness of an AI system directly depends on the quality and quantity of data used for training the models); transparency of algorithms: (the complexity of Machine Learning and Deep Learning models often complicates the understanding of the reasons behind specific outcomes, which can lead to skepticism about the reliability of artificial intelligence systems). The social implications of AI are multifaceted and warrant further investigation. The use of AI may give rise to moral issues, including discrimination, bias, and job displacement. For the successful implementation of AI in corporate management, the authors offer a number of recommendations, including investing in the development of data infrastructure, attracting qualified specialists, developing clear strategies and policies for the use of AI, as well as constant monitoring and evaluation of the effectiveness of AI systems.

**Keywords:** Artificial intelligence; governance solutions; corporate management; Machine learning; Deep learning; Big data; business process automation.

**JEL Classification:** G34, O33, M15, L21, D22

**Formulas:** 0; **fig.:** 2; **table:** 0; **bibl.:** 25

**Introduction.** The article is devoted to the research of integration of certain types of artificial intelligence into the corporate management system, their impact on the quality of governance solutions and overall efficiency of corporations. The integration of artificial intelligence into corporate management is becoming an increasingly relevant topic in the context of rapid technological development, digitalisation and modernisation of business processes. It not only transforms traditional governance models but also opens up new opportunities for process optimisation, decision-making, and increasing the efficiency of production and operation of the corporation.

The systematic use of artificial intelligence in corporate management can significantly improve decision-making processes at the level of the company's management. The use of machine learning and data analytics algorithms allows us to obtain in-depth analytical insights and reports that contribute to more informed decisions when forecasting trends in the development of markets and economic systems. Analysing large volumes of data helps to identify patterns and trends that affect business and shape market conditions. In addition, the use of artificial intelligence to automate business processes can significantly reduce the time and other resource costs for their implementation.

**Literature Review.** The problem of applying artificial intelligence in corporate management is in the focus of research by scholars from many countries who analyse various aspects of this issue. The main ones are the research of the authors: N. Locke, H. Bird (2020), on the impact of AI on enhancing cognitive functions in the management and regulation of companies in the context of strategic decision-making.

A. Volosova, E. Matiukhina (2020) explore the use of artificial intelligence to reduce uncertainty and make informed decisions in corporate management. M. Hilb (2020) proposes an integrated approach to governance, in which AI has both regulatory and auxiliary functions for management structures. X. Cui, B. Xu, A. Razzaq (2022). They explore the possibilities of improving corporate governance through the use of AI, which helps to optimize the processes of reducing operational risks.

P. Cihon, J. Schuett, SD. Baum (2021). Discusses the regulatory aspects of AI governance in order to preserve the interests of society and ensure its compliance with social values. NL. Rane, SP. Choudhary, J. Rane, in many joint studies, consider the benefits of AI for improving corporate finance efficiency through machine learning, natural language processing, and process automation.

**Aims.** The main goal of this study is to analyse some options for integrating artificial intelligence into the corporate management system, to explore the impact on the quality of management decisions, and to identify the main disadvantages and threats of using artificial intelligence models in corporate management.

**Methodology.** The following methods were used in the research process: literature review and systematization of knowledge, empirical analysis, case study and optimization method.

**Results.** There are many definitions of artificial intelligence, the formulation of which depends on the views and research areas of specific scientists or the context of the definition. A generalised definition of artificial intelligence that is not related to the specifics of the subject matter and the angle of its consideration can be formulated as follows: 'it is a branch of computer science that focuses on the development of

machines and systems capable of performing tasks that typically require human intelligence, such as learning, problem solving, and decision making' [6]. In a somewhat simplified version, artificial intelligence can be defined as the imitation of human intelligence processes by machines, especially computer systems [7]. These definitions provide only a superficial understanding of the nature of artificial intelligence, and the essence of this phenomenon should be revealed through the study of its main models or types that are currently most widespread.

Given the rather diverse approaches to defining types of artificial intelligence, it is worth highlighting only a few of the main ones that are relevant to the focus of our study. The main types of artificial intelligence that can be integrated into the corporate governance system are Machine Learning, Deep Learning, Expert Systems, Natural Language Processing (NLP) [8]. In our study, we will consider in more detail the properties of Machine Learning and Deep Learning in order to be able to justify the possibility of their integration into the corporate governance system.

Machine Learning is a type of artificial intelligence that focuses on developing algorithms and models that allow computers to 'learn' from data and improve their results without explicit programming for each specific task. Instead of using hard-coded rules, machine learning allows computers to detect patterns and make predictions by analysing large amounts of data [8]. Unlike traditional programs that perform tasks according to predefined rules, ML systems adapt and improve their performance based on previous results [8]. The principle of machine learning is to execute the following algorithm: data collection, data processing, model selection, training, evaluation, use, and improvement [8]. Let us consider each stage of this algorithm in more detail.

Data collection is one of the most important stages in machine learning, as the accuracy and stability of the model depends on the quality and amount of data. In order for the model to learn how to solve the tasks, it is necessary to collect data that has relevant information and reflects the real world well [9]. It is also worth noting that this is a multi-stage and complex process that includes identifying sources, preparing, annotating and managing data. The further success of the model depends on this stage, as even the best algorithm will not be able to produce good results with poor quality data [9].

The next stage of machine learning is data processing, which includes preparing data for analysis and training. This process ensures high data quality and improves the accuracy of models, as it determines how well algorithms can 'understand' and process data [10]. This stage includes data cleaning, normalisation, selection and creation of features, coding, balancing and transformation. The correct data processing determines how well the model can 'learn' and achieve high accuracy and stability in real-world conditions [10]. Depending on the processed data, the machine learning system selects the model of the machine learning algorithm that is best suited to solve a particular task. Different models have their own strengths and weaknesses, and choosing the right model depends on many factors, such as the type of data, size of the dataset, speed and accuracy requirements, and availability of computing resources [11]. When choosing a model, a combination of analysis of the type of problem, data characteristics, interpretability, accuracy, speed, available computing resources, and learning complexity is involved. Each of these aspects must be taken into account in

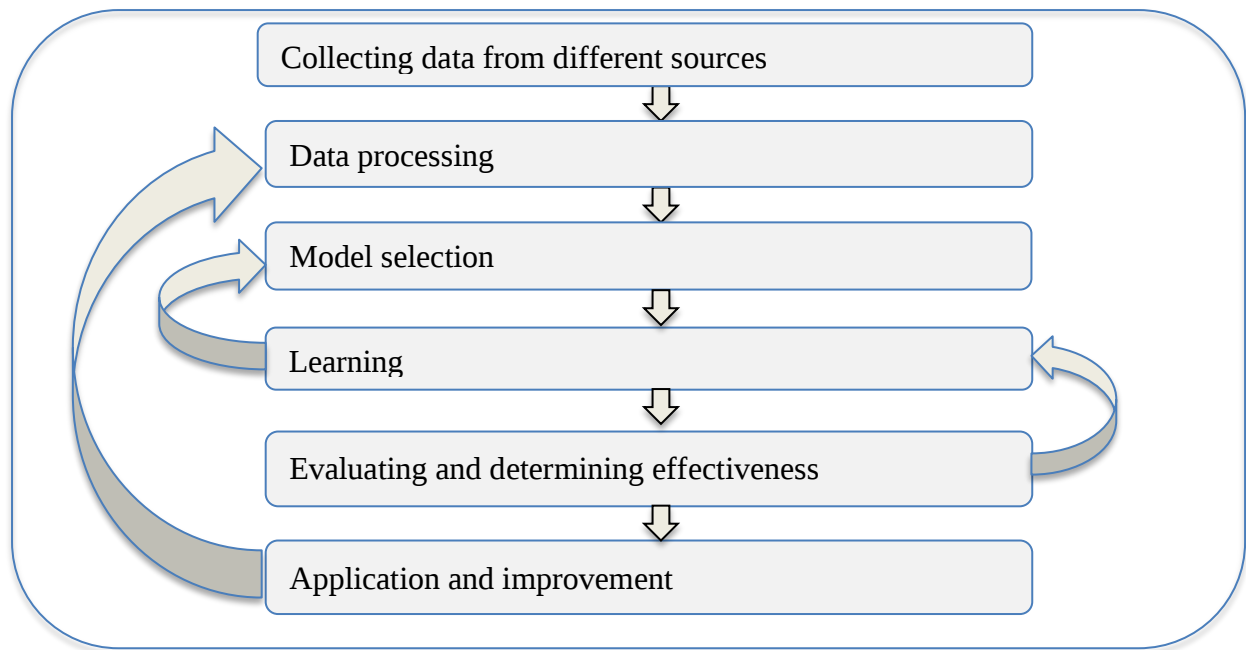
order to obtain a model that not only learns well from the available data, but also retains the ability to generalise to new examples [11]. After selecting the most appropriate model, the AI system conducts ‘model training’, during which it adjusts its parameters to predict the data-driven outcomes as accurately as possible. During training, the system optimises model parameters, adjusts hyperparameters, selects a loss function, selects gradient descent methods, and avoids over- and under-training problems. The ultimate goal is to create a model capable of accurately predicting outcomes for new data, striking a balance between accuracy and generalisation [12].

The next stage of machine learning is evaluation to determine its effectiveness and ability to generalise knowledge on new data. Evaluation helps to understand how well the model can predict the results for a given task, and also allows you to compare different models and tune their parameters. Evaluation is performed using a variety of methods and metrics selected according to the type of task (classification, regression, etc.). to determine its performance and ability to generalise knowledge to new data. Evaluation helps to understand how well the model can predict the results for a given task, and allows you to compare different models and tune their parameters. Evaluation is performed using various methods and metrics selected according to the type of task (classification, regression, etc.), which allows finding the optimal model that not only shows high accuracy on training data, but also is able to correctly predict the results for new data. [12].

The final stage of the machine learning process is usage and improvement, where the model is deployed in a real-world environment for use and is regularly optimised to achieve better results. Implementing a model in a production environment involves integrating it with other systems and ensuring its stable operation, while improvement is a process of continuous monitoring, updating, and tuning to keep its performance at a high level [13]. The process of using and improving a model requires a systematic approach. Deploying, monitoring, updating, automating, and adapting to changes in data ensures stable and accurate model performance. Improving the model helps to keep it relevant, increasing its accuracy and generalisability to achieve business goals and ensure stable performance in real-world conditions [13].

The general scheme of machine learning can be represented as the figure 1.

A different type of artificial intelligence that can be integrated into a corporate management system is Deep Learning, which differs from traditional machine learning approaches by using multi-layered neural networks that have the ability to learn from raw data (e.g. images, audio or text). This eliminates the need for manual feature engineering and allows models to discover important features on their own that they will use for prediction. Deep learning works through hierarchical data processing, where each level of the network learns to identify specific features, from simple to more complex [14]. Other stages of model building are also inherent. Training deep neural networks is a complex process consisting of key stages: Forward Pass, Loss Function, Backpropagation, model optimisation, epochs, and battles. Forward pass involves analysing the input data that passes through the network layers, and each neuron calculates its output based on the input values and its parameters. The output of the last layer is used for prediction [14].



**Figure 1. Machine learning algorithm**

*Source: developed by the author*

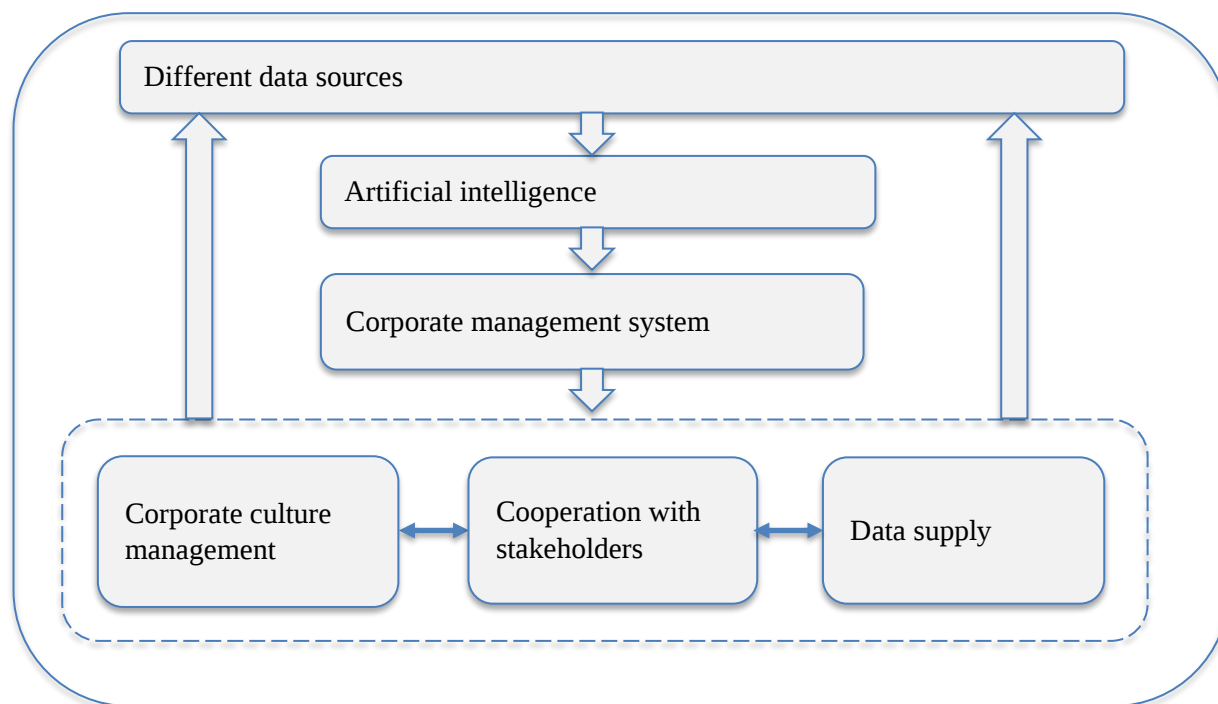
The next stage, the Loss Function, calculates the differences between the predicted values and the actual results. This allows us to assess how accurate the model's predictions are. The Backpropagation stage calculates the derivatives of the loss function for each network parameter to determine how they should be changed to reduce the error. Using an optimisation algorithm (the most common is gradient descent), the weights and offsets are updated to minimise the value of the loss function. Adaptive optimisation methods such as Adam, RMSprop, etc. are often used in deep learning [15]. At the final stage of this model, training is performed on batches (subsets of data) to reduce computational costs, and on multiple epochs, analysing the full cycle of all data. The more epochs, the better the model is trained, but there is a risk of overtraining [15].

Based on the analysed types of artificial intelligence, we will analyse the possibilities of its integration into the corporate management system. It is worth noting that corporate management is a rather broad concept that depends on the individual aspects and functions that are assigned to it. In general, there are several key aspects through which corporate management is manifested and characterised: the system of corporate governance and the organisation of interaction between shareholders and management, the decision-making and planning process, risk and resource management [17]. Given the different characteristic features and properties of corporate management depending on these aspects, the possibility of integrating artificial intelligence into the corporate management system should be considered separately for each area, taking into account their key features and functions.

The top-level manifestation of corporate management is the construction and functioning of the company's internal management system, which includes the

structures and procedures used to manage and control the corporation, and also covers the interaction between the corporation's stakeholders.

The main areas of artificial intelligence integration in this area are the provision of information, interaction with the company's stakeholders, and corporate culture management. A top-level visualisation of the integration of artificial intelligence into the corporate governance system in Figure 2.



**Figure 2. Integration of AI into the corporate governance system**

*Source: developed by the author*

Supplying stakeholders with data is a critical aspect of corporate management that ensures transparency, effective interaction between stakeholders (management, small and large investors, auditors, partners, media, etc.) and enhances social responsibility.

The use of artificial intelligence in supplying data to stakeholders can be implemented through the construction of automated financial reports of the company, which will be generated from various sources and verified based on the established algorithms, and through the calculation of certain financial indicators [17].

The key benefits of integrating artificial intelligence in supplying data to stakeholders are as follows:

1. Personalisation of reports
2. Use of various sources of information
3. Additional verification and error detection
4. Creation of forecasting and planning models
5. Identification of possible fraud
6. Interactivity of data updates

Take a more detailed look at the benefits and the corporate management implications of their implementation

Personalisation of reports for different stakeholders is associated with an automated process of adapting the processing and presentation of data, depending on the requirements of their individual groups.

For the company's management, customisation of reports can be aimed at providing general information describing the company's status and key performance indicators. The key requirement is to form a strategic vision of the market position and development trends of the corporation. As a rule, these reports are generated in the form of dashboards, infographics and other data visualisation methods.

For operational management, reports are generated from the angle of greater detail of operational indicators by type of activity, organisational structure and other levels of detail. They are presented in the form of analytical tables, calculated indicators and detailed graphs. The requirement for the preparation of these reports is to provide specific operational information on specific areas of operation.

Reports for shareholders are prepared taking into account their alleged lack of expertise to assess the current state of the corporation. In such conditions, artificial intelligence, when generating reports, provides an assessment and explanation of the impact on the corporation's development trends in certain areas: profitability, liquidity, planned dividend payments, etc.

When preparing reports for government agencies and regulators, artificial intelligence not only groups and calculates the relevant performance results, but also verifies data and identifies errors in reporting, which reduces the risk of fines and negative audit assessments.

In addition to personalising corporate reporting, artificial intelligence significantly improves the quality of information for management decisions. The advantage is the speed of processing large amounts of data used for analysis. Using machine learning and deep learning algorithms, artificial intelligence significantly speeds up the process of data analysis by sorting and structuring data sets from different sources. It is also worth noting that artificial intelligence significantly increases accuracy and eliminates the human factor as a cause of errors [18]. The ability to detect anomalies in data processing and verification allows avoiding their impact on the results of analysis and recommended decisions, which significantly improves the accuracy of forecasts and risk identification, as well as the quality of management decision-making.

In addition to the impact on information provision, artificial intelligence opens up new opportunities for improving communication between corporations and stakeholders, providing a personalised approach and increasing the overall efficiency and effectiveness of communication with them. By analysing previous stakeholder behaviour and preferences, AI helps to create an individual approach to each client, chatbots and AI-powered assistants can provide round-the-clock feedback to stakeholders and increase their satisfaction while reducing the workload of the company's customer support and inquiries.

The use of artificial intelligence assists in automating logistics and communication processes between individual corporations and partners, ensuring efficiency, reliability and transparency of such cooperation. The development of communication systems based on artificial intelligence allows exchanging,

highlighting the most relevant information, recommending necessary actions, and monitoring changes in the general state of relations [19]. In addition, the introduction of artificial intelligence into the logistics system between partners allows for prompt information about possible delays and breaks in the logistics chains between them.

An unobvious but rather important area of stakeholder engagement is the relationship with the company's employees. Artificial intelligence allows you to better understand the problems and moods of employees through questionnaires or other methods of collecting information, using machine learning and deep learning algorithms. When analysing HR data, artificial intelligence has the ability to cluster and identify certain groups of employees, focusing on both the needs of individual employees and the collective needs of certain groups. The use of artificial intelligence in working with the team allows creating personalised employee motivation programmes to respond to individual requests for better working conditions, build an effective staff development system, and reduce staff turnover [20]. In addition, artificial intelligence takes into account the inclusiveness and diversity of the team, which have become integral components of modern corporate culture.

**Discussion.** The above provisions allow artificial intelligence to effectively influence corporate processes and increase the efficiency of corporate management.

To summarise the above statements, the main advantages of integrating artificial intelligence into the corporate management system can be summarised as follows.

1. Quality and validity of decisions based on the complex impact of artificial intelligence in the process of its integration into the corporate governance system.
2. Forecasting internal and external risks by processing large amounts of data and identifying development patterns.
3. Supporting strategic planning by building long-term development models with their adaptation using machine learning algorithms.
4. Improving the efficiency of decision-making due to the automation of business processes and accelerated data processing
5. Minimising the influence of human factors in the company's management process by eliminating the possibility of subjectivity and bias of individual employees.

In addition to the obvious advantages of using artificial intelligence in corporate management, there are a number of caveats and disadvantages of its use that require detailed consideration and analysis of the impact on decision-making, which will allow developing recommendations to reduce their negative impact on forecasting management decisions.

1. No flexibility and intuitiveness in data processing. Although artificial intelligence is built on the properties of continuous learning, its algorithms are not able to quickly incorporate updated information. This problem is particularly acute during sharp and dramatic changes in market conditions and other external factors. The inability of algorithms to quickly incorporate new data into their algorithms can lead to erroneous interpretations and management decisions [21]. Therefore, one of the key problems of artificial intelligence is the constant updating of its algorithms in accordance with the current situation.

2. Non-transparent decision-making and ethical risks. Since the calculations and decision-making algorithms of artificial intelligence are hidden and cannot be analysed, it

is difficult to understand how artificial intelligence arrives at a particular decision, which significantly limits the possibility of reviewing and justifying it. In addition, artificial intelligence is based on algorithms aimed at finding the most effective and efficient solutions, and does not take into account ethical and discriminatory factors (unless their impact is incorporated into the algorithm) in the process of information processing [22]. Accordingly, the conclusions and recommendations provided by artificial intelligence may be unfair and biased towards certain socio-economic groups (by age, gender, education, etc.), which may lead to reputational losses and legal liability for discrimination.

3. Dependence on core data. One of the key advantages of artificial intelligence is the ability to process large amounts of data, but this also poses one of the main problems related to the quality and relevance of the data used for analysis. Incomplete or poor quality data leads to erroneous conclusions and incorrect recommendations. A separate problem is the historical nature of the data, the analysis of which, without taking into account current factors and trends, also leads to erroneous conclusions and forecasts. In the process of processing, the share of historical data is usually much higher than that of current trends, and artificial intelligence will consider it more reliable and meaningful for processing and analysis [23].

4. A significant negative factor in the integration of artificial intelligence into the corporate management system is the impact on certain categories of employees. While increasing staff productivity, the active use of artificial intelligence can also lead to a decrease in staff morale and motivation due to the diminished role of humans in the management and production process. It is also worth noting that the transfer of simple, monotonous and everyday tasks to artificial intelligence leads to a decrease in the desire of employees to develop themselves, be innovative and creative in their work, which ultimately negatively affects the emergence of new ideas for improving products, prospects and directions of the company's development [24].

5. Another disadvantage of using artificial intelligence is the increase in information vulnerability and the level of cyber attacks. In addition to the fact that cybercriminals can use artificial intelligence to develop new adaptive forms of threats and attacks (deepfakes, mass spam and viruses, etc.), there is also a threat of direct integration of malware into artificial intelligence algorithms, which will allow attackers not only to gain access to company data but also to influence the generation of analytical reports and forecasts, and management decision-making [25].

6. Implementation and support costs. Although the increase in costs cannot be directly attributed to a threat or disadvantage of artificial intelligence implementation, companies should take this factor into account before integrating artificial intelligence into the corporate management system. In addition to the costs of direct implementation, artificial intelligence algorithms require constant improvement and updating, as well as additional cyber security protection mechanisms.

Based on the above comments, the corporation's management should take a balanced approach to the integration of artificial intelligence into the corporate management system. It is worth noting that, subject to the implementation of a number of measures, the impact of negative factors can be significantly reduced, which will

allow positive factors to outweigh the possible disadvantages and risks of introducing artificial intelligence.

The major areas of reducing the risks of negative consequences of the introduction of artificial intelligence should be:

1. Involvement of machine learning and data analytics engineers to develop and maintain artificial intelligence algorithms up to date.
2. Permanent administration of the relevant databases, their updating and verification of information relevance
3. Include the stage of additional verification of analytical reports and recommended solutions with the participation of experts in the analysed area.
4. Developing a human resources management system aimed at supporting the motivation, advancement and self-improvement of employees.
5. Engage additional cybersecurity specialists and implement relevant security systems.

Implementation of these measures will significantly reduce the impact of negative factors from the integration of artificial intelligence into the corporate management system and allow to fully use its benefits for the development of the corporation.

**Conclusions.** Summing up the material presented above, we can conclude that artificial intelligence is becoming a powerful tool for improving the corporate management system. This is due to the automation of business processes, analysis of large amounts of data and the use of machine learning algorithms. Artificial intelligence makes management decisions more predictable and efficient, and ensures transparent relationships with stakeholders. However, the integration of artificial intelligence into the corporate management system requires a comprehensive and cautious approach, given the existence of caveats and drawbacks of its use, which can significantly affect the results of its implementation. Nevertheless, there are a number of methods that can reduce the level of negative factors and increase the efficiency of artificial intelligence.

The use of artificial intelligence requires balancing its ability to automate and process data with manual monitoring of the results of its algorithms to achieve sustainable development of the corporation in economic, social and innovative directions. In the future, the effective integration of artificial intelligence into corporate management is likely to become an important component of corporate success strategies.

After considering only a few types of artificial intelligence in this article and exploring their impact on the most important components of corporate management, there are still many open questions and directions for further scientific and practical research in this area.

To summarise, the integration of artificial intelligence into the corporate management system is an extremely relevant topic that requires a comprehensive approach to addressing social, regulatory and practical challenges. This opens new prospects for business and creates conditions for its sustainable development in the digital transformation.

**Author contributions.** The author contributed fully.

**Disclosure statement.** The author do not have any conflict of interest.

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