

## IMPROVING MANAGEMENT DECISION-MAKING MECHANISMS BASED ON ARTIFICIAL INTELLIGENCE TECHNOLOGIES

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### Abstract

This article examines the theoretical and practical aspects of improving management decision-making mechanisms based on artificial intelligence technologies. In the context of rapid digital transformation, artificial intelligence has become one of the key tools for enhancing the quality, speed, and effectiveness of managerial decisions. The study analyzes the role of AI-based systems, big data analytics, predictive models, and intelligent support systems in optimizing decision-making processes in organizations. The research findings indicate that the integration of artificial intelligence into management activities contributes to more accurate forecasting, risk reduction, operational efficiency, and strategic flexibility. Based on the results, practical recommendations for improving management decision-making mechanisms through the effective use of artificial intelligence technologies are proposed.

### Keywords

artificial intelligence, management decision-making, digital transformation, intelligent systems, data analytics, organizational efficiency, strategic management.

### Introduction

In the modern digital economy, the increasing complexity of organizational environments requires management systems to adopt more adaptive, data-driven, and intelligent approaches to decision-making. Traditional decision-making methods, which often depend on human intuition, limited analytical capacity, and delayed information processing, are becoming insufficient under rapidly changing economic and technological conditions. In this context, artificial intelligence technologies are emerging as a transformative force that can significantly improve management decision-making mechanisms.

Artificial intelligence enables organizations to process large volumes of data, identify hidden patterns, generate forecasts, and support managers in choosing the most effective alternatives. These capabilities are particularly important in strategic planning, operational control, risk management, customer-oriented decisions, and resource allocation. AI-based systems not only accelerate decision-making processes but also improve their accuracy and consistency.

Globally, many advanced organizations have already integrated artificial intelligence into their management systems. AI is applied in financial analysis, supply chain optimization, marketing strategies, human resource management, and corporate risk assessment. As a result, organizations that effectively use artificial intelligence technologies are gaining stronger competitiveness, higher operational efficiency, and greater strategic resilience.

In many developing economies, however, the process of integrating artificial intelligence into management decision-making remains uneven. Although digital transformation is progressing, organizational readiness, technical infrastructure, data quality, and employee competence often limit the practical application of AI tools. Therefore,

improving management decision-making mechanisms based on artificial intelligence technologies is not only a technological issue but also an important scientific and managerial problem.

From this perspective, the main purpose of this article is to analyze the role of artificial intelligence in management decision-making, identify existing challenges in its implementation, and develop practical recommendations aimed at improving managerial decision-making mechanisms on the basis of AI technologies.

### Literature Review

The issue of decision-making has long occupied a central position in management theory. Herbert Simon, one of the pioneers of decision theory, emphasized that managerial decision-making is limited by bounded rationality, meaning that decision-makers often operate under conditions of incomplete information and cognitive constraints. This conceptual foundation later became highly relevant in discussions on intelligent systems that can complement human reasoning.

With the development of digital technologies, scholars began to explore how artificial intelligence could transform managerial processes. Brynjolfsson and McAfee argued that digital and intelligent technologies fundamentally reshape how organizations operate, compete, and create value. According to their analysis, AI-driven systems enable organizations to move from intuition-based management toward evidence-based and predictive decision-making.

Davenport and Ronanki examined the practical use of artificial intelligence in business and found that the most significant benefits of AI arise in process automation, cognitive insight, and customer engagement. Their studies show that AI applications improve managerial efficiency when they are embedded into organizational routines and aligned with strategic goals.

Jarrahi emphasized that artificial intelligence should not be viewed merely as a replacement for managers but rather as a complementary tool that enhances human decision-making. He argued that the most effective decision-making models emerge when machine intelligence and human judgment operate together in a collaborative framework.

Shrestha, Ben-Menahem, and von Krogh also contributed to the discussion by analyzing the implications of algorithmic decision-making in organizations. They highlighted that AI changes the structure of decision rights, accountability, and managerial control, making it necessary to redesign governance mechanisms in line with intelligent technologies.

In addition, Kaplan and Haenlein noted that artificial intelligence technologies have the potential to revolutionize strategic management by improving forecasting accuracy, supporting scenario planning, and enabling more responsive organizational behavior. Their findings suggest that AI-based decision support systems can become an essential component of modern management architecture.

Thus, the literature demonstrates that artificial intelligence is increasingly recognized as a strategic tool for improving managerial decision-making. At the same time, it is clear that successful implementation requires not only technological solutions but also organizational readiness, ethical oversight, and the development of human competencies.

### Research Methodology

The study is based on a systematic, comparative, and analytical approach. Theoretical and empirical sources related to artificial intelligence, management theory, digital transformation, and decision support systems were reviewed and synthesized. Comparative analysis was used to identify the advantages of AI-based decision-making mechanisms over traditional managerial approaches.

In addition, the study applies logical generalization to classify the main challenges and opportunities associated with AI implementation in management systems. The analysis also relies on conceptual interpretation of intelligent technologies such as machine learning, predictive analytics, natural language processing, and automated decision support tools within the context of organizational management.

### Analysis and Results

The study shows that artificial intelligence technologies significantly improve management decision-making mechanisms by increasing the speed, quality, and reliability of managerial decisions. One of the most important advantages of AI lies in its ability to process large-scale data in real time. In traditional management systems, decisions are often made on the basis of fragmented information and delayed reports. In contrast, AI systems can integrate structured and unstructured data from multiple sources, providing managers with a broader and more accurate analytical foundation.

Another important contribution of AI is predictive capability. Through machine learning algorithms and forecasting models, organizations are able to anticipate market changes, identify operational risks, and simulate alternative strategic scenarios. This makes managerial decision-making more proactive rather than reactive. As a result, organizations can respond to uncertainty more effectively and maintain strategic flexibility in competitive environments.

AI technologies also enhance the objectivity of managerial decisions. In many cases, human decisions are influenced by cognitive bias, emotional pressure, and incomplete analysis. AI-based systems reduce these limitations by generating data-driven insights and offering evidence-based recommendations. This is especially valuable in areas such as risk management, financial planning, customer segmentation, and performance monitoring.

At the operational level, intelligent decision support systems improve workflow coordination and resource optimization. Automated dashboards, recommendation engines, and real-time monitoring tools help managers identify inefficiencies, allocate resources more rationally, and improve the consistency of routine and semi-structured decisions. Consequently, organizations can reduce costs, improve service quality, and increase productivity.

At the same time, the research identifies several barriers to the effective use of artificial intelligence in management decision-making. First, data quality remains a fundamental challenge. AI systems can only generate reliable insights when the underlying data are accurate, complete, and timely. In many organizations, fragmented databases, inconsistent records, and weak data governance reduce the effectiveness of AI-driven decisions.

Second, insufficient digital competence among managers and employees limits the practical use of AI tools. Even when intelligent systems are available, decision-makers may not



fully understand how to interpret algorithmic outputs or integrate them into strategic processes. This creates a gap between technological potential and actual managerial value.

Third, there are organizational and ethical concerns. Overreliance on AI may weaken human judgment, while poorly designed algorithms can produce biased or non-transparent outcomes. Questions of accountability, explainability, and trust become increasingly important when artificial intelligence influences high-impact managerial decisions.

Fourth, infrastructure and investment constraints hinder AI adoption, especially in organizations with limited financial and technical resources. The successful implementation of AI-based decision-making mechanisms requires modern digital infrastructure, cybersecurity systems, staff training, and long-term strategic commitment.

**Table 1. Main challenges and mechanisms for improving AI-based management decision-making**

Challenge	Cause	Improvement Mechanism
Poor data quality	Fragmented and inconsistent information systems	Establish integrated data governance and unified digital databases
Low digital competence	Lack of AI-related knowledge and analytical skills	Organize continuous training and AI literacy programs
Limited transparency of algorithms	Complexity of AI models and lack of explainability	Introduce explainable AI tools and human oversight mechanisms
Weak technical infrastructure	Insufficient investment in digital systems	Modernize IT infrastructure and expand digital platforms
Ethical and accountability risks	Bias, opacity, and unclear responsibility	Develop AI governance frameworks and ethical standards

Based on the analysis, it becomes clear that improving management decision-making through artificial intelligence requires a comprehensive organizational approach. AI should not be implemented as an isolated technological instrument; rather, it should be integrated into management architecture, strategic planning, and institutional culture.

First, organizations need to create unified digital ecosystems where data, analytics, and decision support tools are interconnected. Second, managerial staff should be equipped with the competencies required to work effectively with AI-generated insights. Third, governance systems must ensure that AI recommendations remain transparent, controllable, and aligned with organizational values and legal norms.

In this regard, the most effective model appears to be a hybrid decision-making system in which artificial intelligence provides analytical support while final managerial responsibility remains with human decision-makers. Such a model combines the speed and computational

power of AI with the contextual understanding, ethical reasoning, and strategic judgment of human managers.

### Conclusion

The study confirms that artificial intelligence technologies play a crucial role in improving management decision-making mechanisms under conditions of digital transformation. AI enables organizations to process information more efficiently, strengthen predictive and analytical capabilities, reduce uncertainty, and improve both strategic and operational decision quality.

At the same time, the effectiveness of AI-based decision-making depends on a number of institutional factors, including data quality, technical infrastructure, employee competence, governance mechanisms, and ethical oversight. Therefore, the introduction of artificial intelligence into management systems should be approached as a complex organizational transformation rather than merely a technological upgrade.

In conclusion, improving management decision-making mechanisms on the basis of artificial intelligence requires the creation of integrated digital systems, the development of human capital, the modernization of infrastructure, and the establishment of transparent and accountable AI governance. The systematic implementation of these measures will enable organizations to achieve higher efficiency, stronger adaptability, and more sustainable long-term development.

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