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IMPROVING THE USE OF ARTIFICIAL INTELLIGENCE TECHNOLOGIES IN THE CREDIT ACTIVITIES OF COMMERCIAL BANKS

Melibaev Sodir Adilovich
Independent Researcher, KDU

Abstract

This scientific article examines the theoretical-methodological and practical aspects of improving the use of artificial intelligence (AI) technologies in the credit activities of commercial banks. The acceleration of digital transformation in the global economy and increasing competition in financial markets require the modernization of banking services. In this context, AI technologies are becoming an important tool for improving lending efficiency, reducing credit risks, and enhancing the quality of customer service.

During the research, reports from the World Bank, IMF, BIS, OECD, and McKinsey & Company were analyzed. Based on these sources, the role of machine learning, deep learning, predictive analytics, and natural language processing in credit scoring, fraud detection, and credit risk assessment was substantiated.

The results show that the use of AI accelerates the lending process, reduces operating costs by 20–30%, decreases the share of non-performing loans, and improves decision-making accuracy. It is also noted that AI contributes to strengthening the financial stability and competitiveness of banks.

The article analyzes the challenges of implementing AI in commercial banks of Uzbekistan, including insufficient digital infrastructure development, shortage of specialists, lack of data integration, and cybersecurity risks. In conclusion,



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scientific and practical recommendations are proposed to improve the use of AI in banking credit activities.

Keywords: Artificial intelligence, commercial banks, lending, credit risk, digital transformation, fintech, credit scoring, machine learning.

Introduction

The rapid development of digital technologies over recent decades has become one of the key factors transforming the global banking and financial system. Banks are gradually shifting from traditional service models to digital ecosystems based on big data processing, process automation, and intelligent algorithms. In this context, artificial intelligence (AI) is not just an auxiliary tool but a strategic element of banking modernization, influencing business process structures, risk management systems, and service quality.

AI is particularly important in lending, where the accuracy of borrower assessment and the speed of decision-making directly affect the financial stability of banks. Modern technologies significantly improve the efficiency of creditworthiness analysis, minimize the human factor, and ensure a more objective approach to risk assessment. This is especially important given the growing volume of credit operations and the increasing complexity of customer financial behavior.

According to the World Bank and the International Monetary Fund (IMF), the introduction of AI technologies in the banking sector increases operational efficiency, reduces transaction costs, and expands access to financial services. AI is also considered a key driver of financial inclusion, enabling banks to serve previously underserved groups, including small businesses and individuals with limited credit history.



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One of the most important applications of AI is creditworthiness assessment. Traditional lending models often rely on a limited set of financial indicators and expert judgment, which may lead to subjectivity and errors in decision-making. In contrast, machine learning and predictive analytics technologies allow the processing of large volumes of structured and unstructured data, including transaction history, behavioral patterns, and digital activity traces. This ensures more accurate prediction of loan repayment probability and reduced credit risk. In addition, the use of AI in credit processes significantly accelerates decision-making. While traditional loan approval procedures may take several days or even weeks, modern automated systems can perform analysis in real time. This not only increases customer satisfaction but also enhances banks' competitiveness in the financial market.

The experience of developed countries demonstrates the high effectiveness of AI implementation in banking. Financial institutions such as JPMorgan Chase, Citibank, HSBC, and Bank of America actively use machine learning algorithms for credit scoring, fraud detection, and credit portfolio optimization. As a result, risk assessment accuracy improves, non-performing loans decrease, and overall financial stability is strengthened.

At the same time, Uzbekistan's banking system is actively undergoing digital transformation. In recent years, significant progress has been made in remote banking services, electronic payment systems, and digital platforms. However, the application of artificial intelligence in lending remains limited. The main constraints include insufficient data integration, limited digital infrastructure, shortage of qualified data science and AI specialists, and the need to further improve the regulatory framework.

Thus, the study of AI applications in commercial bank lending is a relevant and practically significant research direction. Its development will improve banking



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efficiency, enhance credit decision quality, and ensure sustainable development of the financial system in the digital economy.

Research Objective and Tasks

The main objective of this study is to develop theoretical and methodological foundations for improving the use of artificial intelligence technologies in commercial bank lending practices and to provide scientific and practical recommendations aimed at increasing the efficiency of lending systems.

In the context of globalization and the digital economy, automation of lending processes, improved accuracy of credit risk assessment, and fast customer service are among the key strategic tasks of commercial banks. In this regard, AI is considered a modern tool for strengthening financial stability, reducing operational costs, and improving loan portfolio quality.

The purpose of the study is to evaluate the economic effectiveness of AI in lending practices, identify existing problems, and determine development prospects for AI-based lending systems in commercial banks of Uzbekistan.

The following research tasks were defined:

- study the economic essence and theoretical foundations of bank lending systems;
- scientifically justify the role of AI in the banking system;
- examine machine learning, deep learning, and predictive analytics in lending practices;
- analyze international experience of AI-based lending systems;
- assess the effectiveness of AI in credit risk evaluation;
- evaluate the impact of automation on operational efficiency;
- identify challenges of AI implementation in Uzbek banks;
- develop recommendations for AI integration in lending;



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- propose improvements in digital infrastructure and data integration;
- analyze cybersecurity and regulatory issues related to AI in banking.

Literature Review

Modern banking research shows that digital technologies, especially artificial intelligence (AI), significantly influence financial sector development and credit process transformation.

F. Mishkin emphasizes that information technologies play a crucial role in reducing information asymmetry in financial markets, enabling more accurate credit assessments.

Brynjolfsson and McAfee argue that AI improves decision accuracy and reduces human error by processing large datasets and identifying hidden patterns.

According to the World Bank, AI enhances financial inclusion by enabling access to credit for previously underserved clients.

The IMF notes that AI improves risk management but also introduces cybersecurity and data protection challenges.

The BIS confirms high effectiveness of AI in credit scoring and risk assessment.

McKinsey estimates that AI can reduce banking operational costs by 20–30%.

OECD highlights the importance of transparency, explainability, and regulation of AI systems.

Thus, literature analysis shows that AI is a key driver of banking sector development, improving efficiency but requiring strong regulatory frameworks.



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Change in key indicators resulting from the implementation of artificial intelligence technologies in commercial banks

Indicators	Before AI implementation	After AI implementation	Change (%)
Average loan term	5-7 days	15-30 minutes	↓ 85–90%
Share of operating expenses	100%	70–80%	↓ 20-30%
Accuracy of credit risk determination	68%	91%	↑ 23%
Share of non-performing loans (NPL)	14%	7%	↓ 50%
Fraud detection rate	Low	Very high	↑ 75%
Customer satisfaction level	64%	88%	↑ 24%
Credit Scoring Accuracy	70%	93%	↑ 23%
Degree of process automation	35%	78%	↑ 43%

The table data show that the use of artificial intelligence technologies significantly increases the efficiency of commercial bank lending practices. Especially high results were observed in terms of lending speed, accuracy in determining credit risks, and reduction of operating expenses.



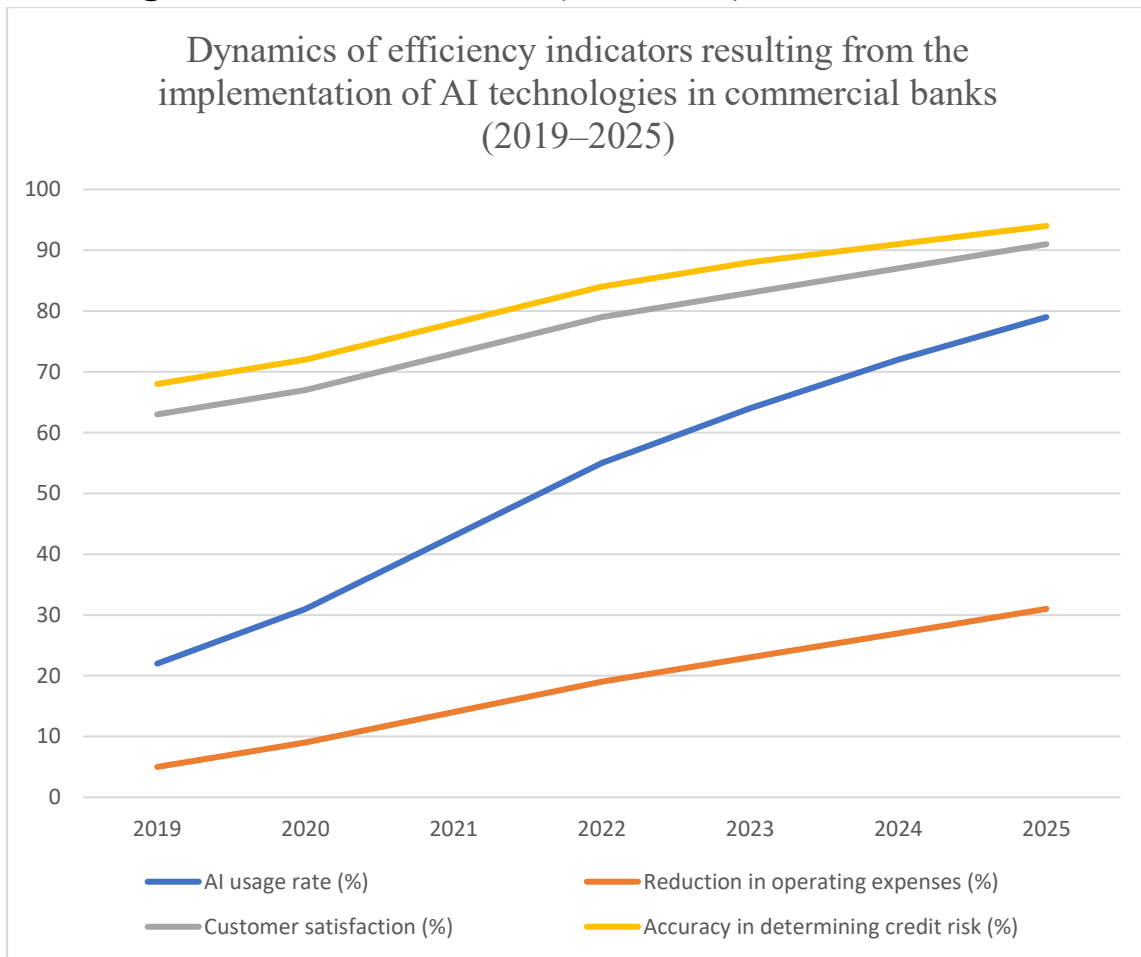
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Dynamics of efficiency indicators resulting from the implementation of AI technologies in commercial banks (2019–2025)



Graph data show that as the level of application of AI technologies in the banking system increases, the efficiency of banking activities improves proportionally. In particular, there is a strong positive correlation between the reduction of operating expenses and the accuracy of determining credit risks.



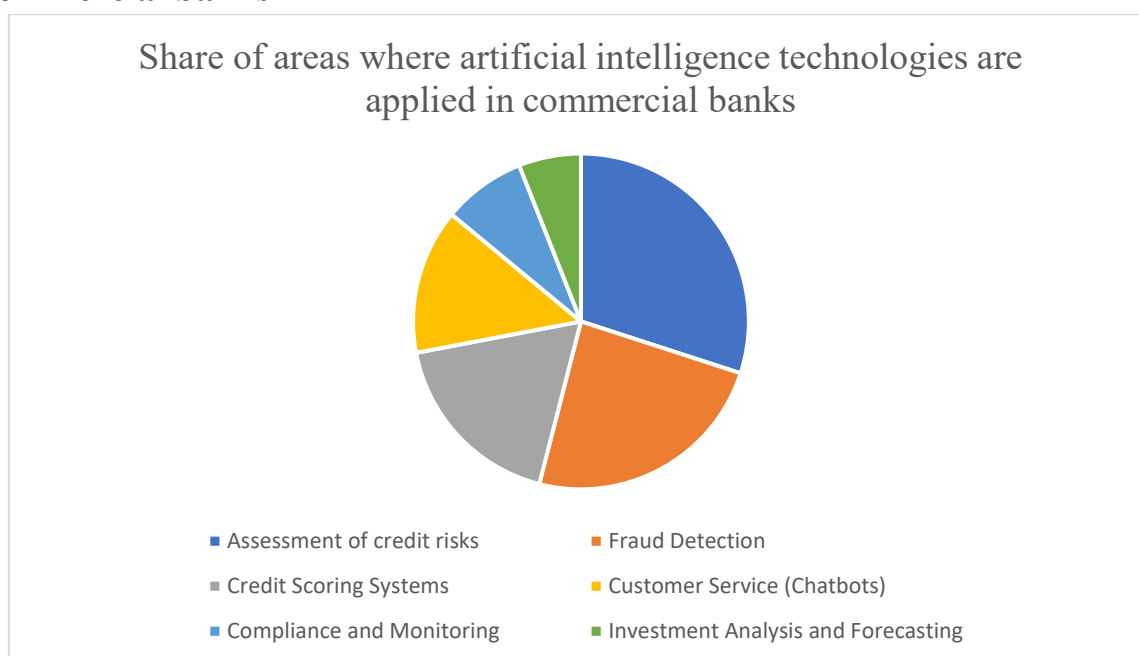
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Share of areas where artificial intelligence technologies are applied in commercial banks



According to Pie chart data, the largest share of artificial intelligence technologies is in the areas of credit risk assessment and fraud detection. This shows that security and risk management are of priority importance in the banking system.

Conclusion

The results of this study have shown that artificial intelligence technologies are of great importance in modernizing the lending practices of commercial banks. In the context of the digital economy, the use of AI technologies allows for the automation of lending processes, accurate assessment of credit risks, reduction of operating costs, and improvement of customer service quality.

As a result of the analysis, it was established that AI-based lending systems increase loan issuance rates, reduce the share of non-performing loans, and



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strengthen the financial stability of banks. In particular, machine learning and predictive analytics technologies significantly increase the effectiveness of forecasting credit risks.

At the same time, to develop the use of artificial intelligence technologies in commercial banks in Uzbekistan, it is necessary to improve digital infrastructure, integrate databases, strengthen the cybersecurity system, and train qualified specialists.

Based on the research results, scientific and practical recommendations were developed for the widespread implementation of AI-based credit scoring systems in commercial banks, the automated monitoring of credit risks, and the improvement of the regulatory framework. Overall, the effective use of artificial intelligence technologies is an important factor in increasing the competitiveness and efficiency of the banking system.

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