



# DEVELOPMENT OF A BANK RISK ASSESSMENT SYSTEM BASED ON DIGITAL TECHNOLOGIES

**Kudaybergenova Guzal Kuanishbayevna**

Independent Researcher, Tashkent State University of Economics

E-mail: [guzalkudaybergenova2@gmail.com](mailto:guzalkudaybergenova2@gmail.com)

Article history:	Abstract:
<b>Received:</b> 10 <sup>th</sup> December 2025 <b>Accepted:</b> 8 <sup>th</sup> February 2026	This article analyzes the theoretical and practical aspects of developing a risk assessment system in commercial banks based on digital technologies. The study examines the issues of effective management of credit, liquidity, market, and operational risks arising in banking activities. In addition, the impact of modern technologies such as artificial intelligence, big data, blockchain, and digital analytics on the process of bank risk assessment is investigated. During the research process, systematic analysis, comparative analysis, and statistical methods were applied. The results of the analysis show that the introduction of digital technologies into bank risk management systems helps increase the accuracy and speed of risk identification, improve the quality of credit portfolios, and reduce operational errors and fraud cases. As a result of the study, scientifically grounded proposals were developed to improve the risk assessment system in commercial banks.

**Keywords:** bank risks, commercial banks, risk assessment, digital technologies, artificial intelligence, big data, blockchain, risk management, credit risk, operational risk, digital transformation

## INTRODUCTION

In the modern global financial system, the stability of commercial banks largely depends on the effectiveness of risk management systems. The banking system is considered one of the key components of the economy, and its stable functioning plays an important role in ensuring financial stability. Therefore, timely identification and assessment of potential credit, liquidity, market, and operational risks in banks is one of the most important tasks[1].

In recent years, the rapid development of digital technologies in the financial sector has significantly influenced banking activities. Modern technologies such as artificial intelligence, big data, blockchain, and digital analytics enable banks to significantly improve the processes of risk identification, analysis, and forecasting. As a result, risk assessment processes in banks are carried out more quickly and accurately compared to traditional methods[2].

Digital transformation processes are also being gradually implemented in the banking system of Uzbekistan. At the same time, there is a need to improve the risk assessment systems of commercial banks based on modern digital technologies[3]. The main objective of this article is to analyze the theoretical and practical aspects of developing risk assessment systems in commercial banks based on digital technologies and to develop proposals for improving the efficiency of this process.

## RESEARCH METHODOLOGY

A number of scientific methods were used in conducting this research. In particular, systematic analysis, comparative analysis, statistical analysis, and economic-logical approaches were applied.

During the research process, the current state of risk assessment systems in commercial banks was studied and comparatively analyzed with international practices. In addition, the digital technologies used in banks and their impact on risk management processes were examined.

Within the framework of the research methodology, factors influencing the development of risk assessment systems in banks were identified and their effectiveness was evaluated. As a result, scientifically grounded proposals were developed for improving risk assessment systems in commercial banks based on digital technologies.

## RESEARCH RESULTS

The results of the study indicate that the use of digital technologies in the process of risk assessment in commercial banks significantly increases the accuracy and efficiency of risk identification. In particular, big data technologies enable banks to analyze large volumes of information about customers, which allows for a more accurate assessment of credit risks[4].

Artificial intelligence-based algorithms make it possible to automatically analyze customers' creditworthiness, payment discipline, and financial condition. This contributes to improving the quality of



the credit portfolio and reducing the share of non-performing loans.

In addition, blockchain technology plays an important role in increasing transparency in banking operations and reducing the risk of fraud. Through digital monitoring systems, banks can monitor operational risks in real time and take prompt measures.

The analysis shows that the implementation of digital technologies in bank risk management systems leads to the following positive results:

- increased speed of risk identification;
- improvement in credit portfolio quality;
- reduction in operational errors and fraud cases;
- enhancement of overall banking stability.

**Table 1**  
**Impact of Digital Technologies on Bank Risk Assessment Processes[5]**

Digital Technology	Application in Banking	Impact on Risk Management
<b>Artificial Intelligence (AI)</b>	Credit scoring models, customer behavior analysis	Improves accuracy of credit risk assessment
<b>Big Data Analytics</b>	Processing large volumes of financial and customer data	Enables more precise risk prediction
<b>Blockchain</b>	Secure transaction recording and verification	Reduces fraud and operational risks
<b>Digital Monitoring Systems</b>	Real-time transaction monitoring	Enhances detection of operational risks
<b>Machine Learning Algorithms</b>	Predictive risk modeling	Improves forecasting of financial risks

Table 1 illustrates the main digital technologies used in modern banking systems and their impact on risk management processes. The analysis shows that artificial intelligence and machine learning technologies play a crucial role in improving credit risk assessment through automated credit scoring models and behavioral analysis of customers. Big data technologies enable banks to process large volumes of financial information, which increases the accuracy of risk prediction.

Furthermore, blockchain technology ensures transparency and security in financial transactions, thereby reducing fraud and operational risks. Digital monitoring systems allow banks to track transactions in real time and respond quickly to potential operational threats. Overall, the integration of these technologies significantly enhances the efficiency of risk assessment and management systems in commercial banks.

**Table 2**  
**Key Advantages of Implementing Digital Technologies in Bank Risk Management[6]**

Indicator	Traditional Risk Assessment	Digital Risk Assessment
<b>Speed of Risk Identification</b>	Slow and manual analysis	Fast and automated analysis
<b>Data Processing Capacity</b>	Limited data sources	Large-scale data processing (Big Data)
<b>Accuracy of Risk Prediction</b>	Moderate accuracy	High predictive accuracy
<b>Fraud Detection</b>	Often delayed	Real-time fraud detection
<b>Operational Efficiency</b>	Lower efficiency	Higher operational efficiency

Table 2 compares traditional risk assessment methods with digital risk assessment systems used in modern banking practices. The comparison demonstrates that digital technologies significantly improve the speed and efficiency of risk identification processes. While traditional methods rely heavily on manual analysis and limited datasets, digital systems utilize advanced data analytics and automation.

Another important advantage of digital risk management systems is the ability to process large volumes of data, which enhances the accuracy of risk forecasting. In addition, digital monitoring tools allow banks to detect fraudulent transactions in real time, reducing financial losses and operational risks. Therefore, the adoption of digital technologies plays a key role in strengthening the stability and reliability of banking institutions.



## **DISCUSSION AND CONCLUSION**

The research results demonstrate the necessity of expanding the use of digital technologies in improving risk assessment systems in commercial banks. Under modern conditions, banking activities are becoming increasingly complex, and therefore traditional risk assessment methods may not be sufficiently effective [7].

Therefore, it is advisable for commercial banks to strengthen their activities in the following areas:

- introducing artificial intelligence and big data technologies into risk assessment processes;
- developing digital analytics and automated monitoring systems in banks;
- applying international standards and best practices in risk management systems;
- improving the digital skills and competencies of bank employees.

In conclusion, the wide implementation of digital technologies in the activities of commercial banks increases the efficiency of risk assessment processes and contributes to the sustainable development of the banking system. In the future, the introduction of innovative technologies will play an important role in further improving risk management systems in banks.

## **REFERENCES:**

1. Hull J. Risk Management and Financial Institutions. – Hoboken: John Wiley & Sons, 2018.
2. Saunders A., Cornett M. Financial Institutions Management: A Risk Management Approach. – New York: McGraw-Hill Education, 2019.
3. Gomber P., Koch J., Siering M. Digital Finance and FinTech: Current Research and Future Research Directions. // Journal of Business Economics. – 2017.
4. Arner D., Barberis J., Buckley R. The Evolution of Fintech: A New Post-Crisis Paradigm. // Georgetown Journal of International Law. – 2016.
5. Compiled by the author based on Hull J.C. (2018) Risk Management and Financial Institutions; Kshetri N. (2016) Big Data's Impact on Risk Management and Fraud Detection in Banking; Vives X. (2019) Digital Disruption in Banking.
6. O'zbekiston Respublikasi Markaziy banki. O'zbekiston bank tizimi bo'yicha yillik hisobot. – Toshkent, 2023.