ORIGINAL ARTICLE

AMERICAN ACADEMIC PUBLISHER
OPEN ACCESS JOURNAL

THE ROLE OF ARTIFICIAL INTELLIGENCE, BIG DATA, AND COMPLIANCE IN MODERNIZING THE BANKING SYSTEM UNDER THE DIGITAL ECONOMY

Anvar Baymanov

Head of the Compliance and Internal Control Department

Zamira Baymanova

Abstract: This article analyzes the integration of Artificial Intelligence (AI), Big Data, and compliance systems in the process of modernizing the banking sector under the conditions of the digital economy. The study highlights the impact of digital technologies on banking operations, financial security, and the quality of customer service. It also examines the effectiveness of using intelligent systems in risk management, fraud detection, and regulatory compliance. The research further explores the development trends of digital compliance systems in Uzbekistan's banking sector as part of its ongoing digital reforms.

Keywords: digital transformation, artificial intelligence, Big Data, compliance, banking system, financial security, digital economy.

Introduction

The rapid development of the digital economy requires new technological approaches within the financial sector. The efficiency of the banking system today is determined not only by economic indicators but also by the degree of digital innovation implementation. Artificial Intelligence, Big Data, and compliance systems play a vital role in reducing risks, increasing customer trust, and improving the quality of services provided by financial institutions. Uzbekistan, within the framework of the "Digital Uzbekistan – 2030" strategy, has identified digitalization of the banking sector as one of its top national priorities.

1. The Essence of Digital Transformation

Digital transformation is the process of deeply integrating digital technologies into all aspects of banking operations. It enhances the speed and convenience of services, simplifies customer interaction, and ensures greater transparency in control mechanisms. Global practice shows that financial institutions which have successfully implemented digital banking services enjoy higher customer loyalty and improved operational efficiency.

2. The Role of Artificial Intelligence in Banking

Artificial Intelligence technologies are widely used in the following areas of banking:

Credit scoring systems: enabling fast and accurate assessment of customer creditworthiness.

Fraud monitoring systems: analyzing transactions in real time to detect fraudulent activities.

Chatbots and virtual assistants: providing 24/7 customer support and personalized service.

Predictive analytics: identifying potential risks in advance to reduce financial losses.

Through AI-based technologies, banks not only improve operational performance but also make strategic decisions based on data-driven insights.

3. The Importance of Big Data Technologies

Big Data plays a crucial role in analyzing customer behavior, developing new financial products, and identifying potential risks. Processing large volumes of data in real time allows banks to:

-offer personalized services tailored to customer needs;

-assess and manage credit risks more effectively;

-detect and prevent fraudulent transactions;

-automate regulatory reporting.

Analytical models based on Big Data enhance decision-making efficiency, ensure transparency of financial flows, and support sustainable banking operations.

4. The Role of Compliance in Digital Transformation

Compliance ensures that banking operations adhere to legal and regulatory requirements. Digital technologies have enabled automation and optimization of compliance functions through:

AI-based AML (Anti-Money Laundering) systems that detect suspicious transactions;

Digitized KYC (Know Your Customer) processes that simplify customer identification;

Big Data analytics facilitating real-time reporting to regulatory authorities.

Digital compliance systems reduce the risk of regulatory violations and help banks align their operations with international financial standards.

5. Uzbekistan's Experience

Uzbekistan's banking sector has been actively implementing digital reforms in recent years. Mobile applications, online payment systems, electronic signatures, and remote lending services have become widespread. At the same time, digitalization of compliance systems has strengthened customer identification, AML monitoring, and risk analysis processes. The Central Bank and other regulatory bodies are also taking steps to build a comprehensive digital compliance infrastructure.

6. Current Challenges

Despite positive progress, several challenges remain relevant in the process of digital transformation:

-ensuring data security and confidentiality;

-shortage of qualified specialists in IT and compliance fields;

-insufficient development of technological infrastructure;

-underdeveloped legal frameworks for AI and Big Data usage.

Conclusion

Artificial Intelligence, Big Data, and compliance systems occupy a central position in the digital modernization of the banking sector. These technologies enhance service quality, strengthen financial stability, and ensure accurate compliance with regulatory requirements. In the future, digital compliance, automated risk monitoring, and intelligent analytical systems will become key factors defining the competitiveness and sustainability of banking institutions.

References:

1. Davenport, T., & Ronanki, R. (2018). Artificial Intelligence for the Real World. Harvard Business Review.

2. Brynjolfsson, E., & McAfee, A. (2017). The Business of Artificial Intelligence. MIT Sloan Management Review.

3. World Bank. (2023). Digital Economy Report. Washington, DC.

4. Basel Committee on Banking Supervision. (2021). Principles for the Effective Management and Supervision of Climate-related Financial Risks. Bank for International Settlements.

5. OECD. (2022). Data Governance and Privacy in the Financial Sector: Policy Guidelines. Paris: OECD Publishing.

6. PwC. (2023). The Future of Compliance: How AI and Automation Are Transforming Regulatory Oversight.

7. Central Bank of the Republic of Uzbekistan. (2023). Digital Transformation Strategy 2023–2026. www.cbu.uz

8. IMF. (2022). Fintech and Financial Stability: Implications for Banks and Regulators. International Monetary Fund, Washington, DC.

9. KPMG. (2022). AI-Driven Compliance and Risk Management in Banking. Global Financial Services Report.

10. UNCTAD. (2023). Digital Economy Report 2023: Building a More Secure Data Future. United Nations Publication.