European Journal of Economics, Finance and Business Development
ISSN (E): 2938-3633
Volume 3, Issue 2, February - 2025

ARTIFICIAL INTELLIGENCE FOR BANKING DEVELOPMENT

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Abstract

The article addresses the growth and adoption of artificial intelligence (AI) in the financial sector. It explores the definitions of AI, its types, key technologies, and major trends in their evolution. The article also examines the application of AI across various segments of the financial market, the conditions fostering the development of AI technologies, and potential risks associated with their implementation by financial institutions. Special attention is given to global trends in AI regulation, including existing standards, best practices, and approaches to ensuring the security and ethical use of these technologies. The article emphasizes the importance of adapting to new conditions created by AI-driven innovations and highlights the need for financial organizations to develop strategies that support the effective and safe application of these technologies.

Keywords: Artificial intelligence, financial markets, finance, digital technologies, digital platform, online service.

Introduction

The banking sector, due to its openness to technological innovation, has become one of the first industries in the economy to actively adopt artificial intelligence (AI) technologies. These technologies serve as powerful tools for a profound transformation of banking operations, triggering significant changes in the structure of financial markets and their regulation. The integration of AI is leading to fundamental shifts in the business models of traditional banks, their corporate structures, and competitive dynamics, as well as the emergence of new operational models and methods of customer interaction. Banks worldwide, including in Uzbekistan, are leveraging AI to enhance customer service, analyze customer needs, increase revenues, and reduce operating costs, thereby strengthening their competitive positions.

Recognizing this trend and to facilitate the accelerated implementation of AI, the Presidential Decree of the Republic of Uzbekistan No. PP-4996, "On Measures to Create Conditions for the Accelerated Implementation of AI Technologies," was adopted on February 17, 2021. This document laid the legal foundation for the further development of AI and defined key directions for its advancement. Additionally, the Scientific Research Institute for the Development of Digital Technologies and AI was established under the Ministry for the Development of Information Technologies and Communications to conduct fundamental and applied research in AI while collaborating with international innovation and research institutions.

To further foster a favorable environment for AI, Decree No. PP-5234, "On Measures for the Implementation of a Special Regime for the Application of AI Technologies," was adopted on August 26, 2021. This document aims to create an optimal ecosystem for the development of innovative business models, products, and services based on AI.

In recent years, the landscape has changed significantly: advancements in technology have made computational processors more efficient for data analysis, and their affordability now allows for their use not only in scientific research but also in real-world business processes across various economic sectors [1]. The term "FinTech" refers to technology-driven financial innovations that create new business models, applications, processes, or products with tangible impacts on financial markets and institutions [2].

Literature Review

The influence of AI on the transformation of the financial sector has been explored in various studies. Research by Deutsche Bank analyzes the transition of the traditional banking system into a digital ecosystem under the influence of new technologies [3]. Works [4, 5] discuss different types of business models for FinTech projects, while article [6] focuses on global trends in the FinTech market. A study on risk management in the FinTech sphere is presented in [2], where the authors emphasize the need to minimize negative impacts on consumers and investors for the sustainable development of FinTech projects. Additionally, study [7] highlights that business models of FinTech startups may not always align with the stability requirements of the financial sector, particularly when innovations in payments affect the resilience of financial systems.

Research Methods

The methodological foundation of the study is an institutional approach to managing the development of artificial intelligence (AI) technology, including analysis and practical synthesis of its essence. The analysis and synthesis methods were employed to examine the structure of AI technology management and the growth rates of real aggregate income of the population on a regional scale.

Analysis and Results

Currently, AI technologies are widely used by financial market participants in various business processes, such as customer interactions, risk management, analytics, monitoring, and operations execution. There remains significant potential for further expansion of AI applications by financial organizations, which could enhance their efficiency and the quality of services provided. However, the rapid development of AI technologies, particularly in generative AI, introduces new opportunities as well as challenges and risks. Therefore, it is essential to both foster conditions for the development of AI technologies and define regulatory directions.

AI is gradually becoming a universal technology capable of transforming business processes and market practices within financial organizations (Table 1).

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Table 1

Examples of Artificial Intelligence Applications in Financial Organizations

Application Area	Field of Use	Type of AI
Front Office	Chatbots	AI algorithms based on natural language processing
	"Smart" Marketing Tools	AI algorithms with deep learning elements for generating personalized offers
	Algorithmic trading, investment consulting, and asset valuation	AI algorithms based on regression models for performance evaluation
Second Line: Verification and Processing of Transactions Third Line: Operational Accounting	Scoring	AI-based applications for credit scoring, accessible to clients as well
	Transaction confirmation, document processing	AI algorithms integrated with payment data and risk management systems for instant decision-making
General	Transaction monitoring	AI algorithms capable of real-time tracking of suspicious activities and notifying users
Second Line: Verification and Processing of Transactions	Development and optimization of software	End-to-end service function for business processes

Source: Application of Artificial Intelligence in the Financial Market. Report for Public Consultations. Bank of Russia. Moscow, 2023 [8].

Scoring is one of the primary applications of AI in the financial market. It enables organizations to more accurately segment customers into homogeneous groups, identify their needs, and assess risk profiles. AI-driven credit assessment systems can be fully automated, providing instant decisions based on data analysis while complementing traditional methods. For example, analyzing utility bill payments allows the inclusion of new variables in credit assessment models, leading to more precise credit scores for customers with limited credit histories. "Smart" AI-based scoring effectively leverages not only financial information, such as credit history or income, but also alternative customer data, including financial habits, geolocation, and social media activity (Fig. 1).

One of the earliest successful examples of AI application was the introduction of an automatic credit authorization system by the UK retailer Marks & Spencer in 1991. The Behavioural Scoring program enabled the automatic processing of approximately 90% of credit applications, offering decisions based on data analysis of residence, credit history, and account transactions [9].

The use of "alternative" data, as well as the application of AI models, can be valuable for discovering new correlations or hidden dependencies. However, the use of such data in the financial sector raises concerns among clients and regulators regarding confidentiality and ethical use. For this reason, legislation in some countries restricts the uncontrolled use of such data in AI algorithms, fearing unintended discrimination against applicants or other potential harm [10].

Using area	Impact Assessment (on a 100-point scale)
Customer Service Automation	70
Data Analysis for Lending	65
Financial Risk Prediction	60
Personalized Offers	58
Fraud Detection	55
Optimization of Internal Processes	53
Asset Management	50
Market Forecasting	48

Source: Transforming Paradigms. A Global AI in Financial Services Survey. World Economic Forum. Cambridge Centre for Alternative Finance (January 2020).

Figure 1. Application of Artificial Intelligence in Banking Business

Fraud prevention is another area where the application of AI mechanisms is expanding. With its ability to analyze large datasets, detect unusual transactions, and identify anomalies that are difficult for humans to spot, AI technology has elevated fraud detection procedures to a new level, surpassing traditional risk factor analysis while reducing resource intensity. In real-time, AI algorithms can flag events as suspicious, block transactions uncharacteristic for a client (e.g., signs of credit card fraud), or involve financial institution employees for more detailed document and image verification (e.g., insurance fraud or misrepresentation in financial reporting).

In the area of customer inquiries and claims resolution, AI can be applied to classify incoming requests and automatically read and process data. The development of generative AI significantly simplifies and optimizes the interaction between financial institutions and claimants. Chatbots and voice assistants handle routine functions throughout the claims resolution process [11].

Although banks in Uzbekistan already have customer databases, these need to be formatted for convenient use. As a solution, foreign banks have implemented a unified **Data Warehouse (DW)** system, which serves as a centralized data repository. Successful implementation of AI plans can increase the efficiency of banks, reduce costs, and improve service quality. Chatbot security is ensured through technologies similar to those used in mobile applications, including two-factor and biometric authentication, behavioral analysis, and other advanced AI technologies. To ensure maximum security, communication with chatbots must be encrypted.

In Uzbekistan, banks are actively adopting chatbots. For example, the **National Bank of Uzbekistan (NBU)** is developing a chatbot for the popular Telegram messenger. The NBU chatbot will improve the quality of remote services by allowing clients to instantly receive online consultations and learn about new products and promotions. Additionally, it will help reduce the workload on call centers and lower their operational costs. Based on the above, it is

safe to say that chatbots and robo-advisory have significant potential for development in the banking sector of Uzbekistan [12].

Conclusion

Overall, artificial intelligence (AI) technologies have immense potential to enhance the efficiency and competitiveness of banks. However, numerous external and internal factors hinder the realization of this potential. The analysis revealed the following issues related to the development of AI technologies:

- Lack of open-source statistics for AI development;
- Absence of a robust regulatory framework for AI technologies;
- Shortage of highly qualified personnel in the field of AI;
- Weak government support for AI startups;
- Low levels of international cooperation in implementing scientific, technical, and innovative projects in this domain;
- Underdeveloped infrastructure for deploying AI-based software products;
- Limited availability of local services necessary for AI project implementation;
- Absence of enterprises operating in the AI sector, low competition, and slow integration of science and production;
- Insufficient knowledge and skills for AI technology implementation within the country.

To address these challenges and advance the development of artificial intelligence technologies effectively, the following key aspects of a comprehensive approach are proposed:

- Establishing, supporting, and expanding international research and development collaborations in AI technologies;
- Developing AI-based information systems and algorithms, integrating them with existing systems, and organizing their export to other countries in the region;
- Creating and strengthening the necessary regulatory framework, as well as expanding telecommunications infrastructure and data volumes;
- Enhancing the qualifications and skills of employees in government agencies, local self-governance bodies, and public institutions, while also supporting the system of training highly qualified specialists in higher education.

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