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УДК

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USING BIG DATA AND ARTIFICIAL INTELIGENCE TO PERSONALIZE RETAIL BANKING OFFERINGS

Abstract. *The article examines the role of big data and artificial intelligence for the banking sector and the quality of customer service. It analyzes the information and communication technologies used in the context of technological development. The article emphasizes the importance of combining science and technology to train specialists and improve banking services.*

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ИСПОЛЬЗОВАНИЕ БОЛЬШИХ ДАННЫХ (BIG DATA) И ИСКУССТВЕННОГО ИНТЕЛЛЕКТА ДЛЯ ПЕРСОНАЛИЗАЦИИ ПРЕДЛОЖЕНИЙ В РОЗНИЧНОМ БАНКИНГЕ

Аннотация. *Статья рассматривает роль больших данных и искусственного интеллекта для банковского сектора и качества клиентского обслуживания. Анализируются используемые информационно-коммуникационные технологии в контексте технологического развития. Подчеркивается важность объединения науки и технологий для подготовки специалистов и улучшения банковского обслуживания.*

Modern retail banking is undergoing a fundamental transformation. Previously, banks operated on the principle of "one product for all," but now customers expect personalized approaches and offers based on their lifestyle and financial capabilities.

Against this background, Big Data and artificial intelligence (AI) technologies are becoming a key tool for creating truly personalized interactions. They allow you to move from generalized characteristics to a more accurate, unique description of each client. The relevance of this scientific work lies in the analysis of specific mechanisms and examples of the use of these technologies to increase the competitiveness of banks.

The purpose of the work is to analyze the ways and effects of using Big Data and Al to personalize offers in retail banking.

To achieve this goal, the following tasks were set: to consider the sources of big data formation in the banking sector, to study the AI algorithms used, to analyze real implementation cases, and to assess the emerging difficulties related to security and ethics.

1. Big data as the basis for personalization.

Banks initially had large amounts of structured information: transaction history, data on loans, deposits. However, a real breakthrough became possible with the connection of Big Data. These include:

• Real-time transaction data: Each card transaction is not just a debited amount, but a signal about the customer's behavior. A purchase in a children's store, payment for groceries in a specific store, or subscription to a service all create a digital footprint.

• Data from digital channels: The customer's behavior in the mobile app and online banking is analyzed, including which sections they open frequently, how much time they spend researching stocks, and which transfers they make.

• External data: Data from social networks (with the user's permission), geolocation data, and credit history are used to expand the information.

2. Artificial intelligence algorithms in action.

Among the most common approaches to information processing, the following can be distinguished:

• Machine learning (Machine Learning) for predicting customer needs. Based on past data, machine learning models learn to predict the next likely action a customer will take.

• Behavioral assessment and identification of life events. More sophisticated models analyze transaction sequences to identify patterns. This allows the bank to show care by offering assistance at the right time.

• Natural Language Processing (NLP) neural networks. These technologies are used to analyze calls to call centers and chats. AI determines the emotional coloring of a message, key topics, and based on this, makes recommendations to the operator or chatbot for the most effective response, while simultaneously offering the client a relevant product to solve his problem.

As a result, AI does not just automate the process, but creates an intelligent system that constantly learns and adapts to the changing behavior of each individual.

3. Practical implementation and measurable results in Belarus.

The theoretical advantages of personalization are confirmed in practice in the Belarusian banking system. The country's largest banks are actively implementing big data and artificial intelligence technologies to improve the quality of service.

In 2022, the National Bank of the Republic of Belarus proposed a project to create a unified financial data platform. This system allows customers to analyze account information from different banks to create a comprehensive financial profile. The implementation of the unified financial data platform creates a technological foundation for deep personalization of offers at the level of the entire banking system in the country.

Belagroprombank was one of the first Belarusian banks to launch an analytics system based on its own data center. The algorithms analyze transaction data from more than 3 million customers, identifying patterns in their behavior. This personalization has increased the conversion rate for deposits by 27% compared to mass mailings.

Belgazprombank is developing personalization in digital channels. The bank's mobile app uses machine learning to adapt the interface to the specific user. For customers who actively use card products, the app offers relevant promotions from loyalty program partners. According to the bank's internal statistics, personalized push notifications have a 4.3 times higher click-through rate (CTR) compared to mass mailings.

As the largest retail bank in the country, Belarusbank uses AI to segment its customer base. The grouping algorithms identify more than 200 micro-groups of customers with unique behavioral patterns. For each of these groups, the bank creates special offers for credit and savings products. This has helped the bank reduce the outflow of premium-segment customers by 15% in 2023.

These examples demonstrate that Big Data and AI-based personalization delivers measurable business results: increased sales, higher average revenue per customer, reduced churn rates, and improved marketing campaign performance.

4. Challenges and Barriers to Implementation in Belarusian Practice.

The implementation of Big Data and AI technologies in the Belarusian banking sector faces several specific challenges, driven both by regulatory considerations and the level of technological development.

The compliance with the Law of the Republic of Belarus "On Personal Data" remains a key barrier. The law establishes strict rules for processing information, including the requirement for data localization in Belarus. This creates additional difficulties when using international cloud solutions and AI platforms. Banks have to develop their own solutions or adapt existing ones to the requirements of the regulator.

A significant limitation is the level of technological maturity of a part of the banking system.

As a result, there is an uneven distribution of advanced technologies across the banking sector. The gap between technological leaders and laggards continues to widen, creating an imbalance in the retail banking market.

Cybersecurity remains a separate issue. Working with big data significantly increases the attack surface and requires appropriate investments in security systems.

User acceptance of technology is an important aspect. Sociological studies conducted by the Belarusian State University of Economics show that

42% of Belarusian customers fear excessive interference by banks in their private lives through data collection. This creates reputational risks and requires banks to increase transparency in explaining the benefits of personalization.

Infrastructure limitations also slow down the implementation of advanced solutions. The speed of the Internet in the regions of Belarus, the quality of mobile coverage affect the possibility of implementing solutions in real time. This creates a digital gap between the capital and regional customers in access to personalized services.

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ТРАНСФОРМАЦИЯ ИННОВАЦИОННЫХ ПРОЦЕССОВ ПРОМЫШЛЕННЫХ ОРГАНИЗАЦИЙ В УСЛОВИЯХ ЦИФРОВИЗАЦИИ

Аннотация. *Рассмотрены направления цифровизации инновационных процессов промышленных организаций. Выявлены группы сетевых инновационных процессов, для которых наиболее актуальна цифровая трансформация. Охарактеризованы ключевые факторы и проблематика цифровизации инновационных процессов промышленных организаций.*

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