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Digital Transformation of Regional Banks: The Role of AI and Open API

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ABSTRACT

The subject of the study is the process of digital transformation of regional banks within the framework of integrating artificial intelligence (AI) and open APIs (Open API). The impact of these technologies on the competitiveness of banks, the transformation of their business models, and their adaptation to the modern challenges of digitalization are considered. **The purpose of the study** is to determine the advantages of using AI and Open APIs in a regional bank, identify obstacles, and develop practical approaches that facilitate the integration of these technologies into banking operations. **Methods** such as system analysis, the logical method, and process and empirical approaches were applied. Special attention is given to assessing the costs of implementing AI and Open APIs. The study allowed for the formation and justification of directions for the digital transformation of banks through the integration of AI and Open APIs. The costs associated with digitalization are presented, and ways to minimize these expenses are proposed. An important outcome of the study was the identification of areas for cooperation between regional banks and FinTech, which allows them to reduce costs when using open APIs. **The novelty of the study** lies in analyzing the specifics of AI and Open API integration in regional banks, unlike most studies that focus on examining the digitalization practices of large credit institutions. The author proposes approaches to integrating innovative solutions, taking into account limited IT budgets. This allows us to view AI and Open APIs not only as tools for process optimization, but also as factors for the survival of regional banks in the digital age. The research findings can be used by regional banks in developing digital transformation strategies and optimizing business processes. The proposed directions will allow banks to reduce costs associated with AI and Open APIs, as well as identify the most promising partnership models for collaboration with technology companies.

Keywords: artificial intelligence; AI; Open API; regional banks; digital transformation; FinTech; digital ecosystems; innovation

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INTRODUCTION

The modern financial intermediation industry is on the verge of large-scale transformations driven by the development of artificial intelligence (AI), open APIs, and the integration of algorithmic solutions into banking processes. Traditional banking business models are gradually giving way to intelligent digital ecosystems based on automated solutions, big data analysis, and predictive risk management mechanisms. The development of cognitive financial systems, API 3.0, and global Open Finance marketplaces is shaping a new product and service architecture in which banks can either occupy a unique niche or, conversely, face a loss of position.

These theses are supported by a large number of scientific studies. Specifically, in the papers [1, 2] emphasize that AI is becoming a key element of the digital transformation of the banking sector, improving forecasting accuracy, risk management, and the personalization of financial services. At the same time, in the work [3], the author points out that despite the positive impact of AI in Russia, its potential is being realized less effectively than abroad, which is explained by insufficient investment and non-systematic use.

In the papers [4, 5] explore how AI is changing the traditional model of banking interaction with FinTech by developing new technologies and services, forming dynamic systems. Foreign research [6] also confirms that AI and Open APIs are capable of optimizing banking processes and changing the way customers interact with banks.

Some researchers demonstrate how the traditional banking model, based on closed systems, is gradually giving way to Open Banking and Open Finance, which involve the free exchange of financial data between banks, FinTech companies, and third-party service providers. Using Open API allows financial market participants to develop new services and integrate external platforms. Among them, we can highlight the paper of [7–10]. However, despite the promise of AI, its implementation is accompanied by a number of barriers. So, D.A. Kochergin [11], K. Bagrationi and T. Thurner [12] identify among them a shortage of qualified AI specialists and employee resistance to technological changes. In works [13–16], the authors point out that successful AI integration requires large-scale investments in IT infrastructure for strategic interaction between banks and technology companies.

Despite the diversity of research directions in digitalization, it should be noted that works dedicated to the application of AI and Open APIs in regional banks are not very common at present. Among them, we can highlight papers [17–20].

O. S. Petrova and A. S. Fedorov [17] emphasize that the lack of telecommunications infrastructure and insufficient material resources hinder the use of electronic service channels in local banks. The authors also highlight concerns about the security of electronic systems, as any cyberattack quickly undermines trust, especially in regions with low levels of digital literacy. According to S.V. Shkodinsky and co-authors [18], a large volume of data is needed for scoring models and transaction analysis to work correctly, and credit institutions in the regions rarely have a large customer base. A. Yu. Anisimov and co-authors [19] take a similar position, noting that the lack of well-established internal processes and the need to comply with new Open API standards already increase the workload on personnel responsible for IT procedures. O.S. Petrova and A.S. Fedorov [17] point out that it is extremely difficult to find specialists in small towns who are capable of deploying secure digital platforms and analyzing potential vulnerabilities. Additionally, S.V. Shkodinsky and his colleagues [18] note socio-territorial differences: in remote areas, network speed is low or completely absent, which prevents mobile applications from loading quickly. N. Yu. Lukyanova et al. [20] note that under such conditions, any serious application failure can create a negative reputation for remote banking in the province. The situation is also complicated by the incompatibility of IT systems. The article [21] highlights that the lack of unified data exchange standards hinders

interbank operations, and updates to internal platforms often lead to technical issues. Almost all researchers agree that without attracting investment in server upgrades and without high-quality data analytics, local banks cannot fully implement complex solutions like AI and Open API.

Despite the obvious technological and operational advantages, the integration of AI and Open APIs into regional banks faces a number of limiting factors. These include insufficient investment resources, a shortage of qualified IT personnel capable of developing and maintaining complex analytical solutions, and the technological backwardness of the infrastructure used, which hinders the modernization of internal systems. This leads to banks being unprepared to implement large-scale digital transformation projects, which will inevitably deepen the technological gap and result in a loss of market position in the long-term.

The unresolved nature of these issues underscores the relevance of this study and highlights the need for further research aimed at identifying the potential of AI and Open APIs in the regional banking sector. It is also necessary to consider that within the framework of the Bank of Russia's concept for implementing Open API in the financial market, all banks will be required to use open API standards starting in 2026.[1] The study analyzed the economic and technical aspects of integrating AI and Open APIs into banking processes. Special attention is given to cost optimization issues when implementing AI and Open APIs.

METHODOLOGY

In this study, we assume that the digitalization of banking inevitably leads to changes in traditional business models, and the ability to integrate new technological standards becomes a decisive factor in their competitiveness. The methodological basis of the work is systems analysis, which allows for the study of the interaction of various elements of the banking sector, including API infrastructure, AI algorithms, and customer services. Process and empirical approaches are also used, which allow for structuring the stages of AI and Open API integration and determining the overall costs for banks. The research is based on analytical reports and publications from the Central Bank of Russia, the FinTech Association, as well as articles from leading scientific journals dedicated to the digitalization of the banking sector over the past 5 years. The empirical basis used includes data on the cost of AI and Open API,[2] as well as data on the cost structure associated with the digital transformation of banks. Particular attention is given to assessing the total costs of developing AI solutions and training personnel. This approach allows us to assess how regional banks can transform from traditional institutions into flexible, self-learning structures capable of operating within automated financial ecosystems and offer specific measures to reduce costs when integrating AI and Open API.

DIRECTIONS FOR INTEGRATING AI AND OPEN APIS IN BANKS

Traditionally, credit institutions operated within closed systems where access to data and services is strictly regulated by internal rules. This model provided a high level of security, but at the same time, it limited opportunities for innovation and collaboration with external partners. With the development of digital technologies and changing consumer expectations, there has been a need for a more open and flexible architecture.

The transition to Open API is supported at the level of the Central Bank of the Russian Federation. The Bank of Russia has developed a concept for implementing Open API in the financial market and standards for banking interfaces,[3] the application of which

[1] The concept of implementing Open APIs in the financial market. URL: https://cbr.ru/Content/Document/File/142114/concept_09–11–2022.pdf. (accessed on 20.03.2025).

[2] The Evolution of banking. how and why big businesses are switching to Open APIs. URL: https://sber.pro/publication/evolyutsiya-bankinga-kak-i-pochemu-krupnii-biznes-perehodit-na-open-api/ (accessed on 20.02.2025).

[3] Website of the Bank of Russia. URL: https://www.cbr.ru/fintech/acts/?la.search=&la.tagid=3&la.vidid=26&la.date.time=any&la.date.datefrom=&la.date.dateto= (accessed on 20.02.2025).

contributes to the development of products and services in the financial market. These standards create uniform rules for market participants to interact and allow banks and FinTech companies to set up customer data exchange with their consent.[4]

For a clear understanding of the processes of AI and Open API integration in the banking sector, let's combine the main development directions in *Table 1* and assess the possibilities of their implementation. The proposed table requires a more detailed explanation of each direction:

1.1. Cognitive Financial Systems. In the future, AI in banking will transform into cognitive financial platforms [22] that will combine three key technologies:

- *Hybrid machine learning*. Banks will have the opportunity to combine classic decision-making algorithms with probabilistic models.
- *Meta-learning*[5] *and autonomous integration*. Thanks to the self-learning ability of AI systems, banks will be able to operate in conditions of uncertainty, where traditional statistical models are insufficient.
- *AI-based financial self-regulation*. The use of self-regulating AI systems will allow banks to automatically maintain liquidity by allocating assets based on predicted customer behavior and market conditions.

1.2. Quantum AI and Forecasting. Unlike traditional AI models, quantum algorithms are capable of analyzing multidimensional correlations and working with probabilistic states, which will provide banks with a deeper level of analytics and predictive accuracy. By using quantum AI, banks will be able to process large volumes of market data, taking into account the influence of numerous macroeconomic factors and complex non-linear relationships between different financial instruments.

1.3. API 3.0 — fully integrated and self-regulating APIs. APIs 3.0 are significantly different from today's solutions, which require strict standardization. API 3.0 will function based on: automated adaptation, where APIs can adjust to client requests in real-time; autonomous machine learning elements; and instant cross-data analysis, where the API infrastructure can exchange information between banking, insurance, and investment services in real-time.

1.4. Global Open Finance Marketplaces. Open APIs are going beyond banking services and becoming the foundation for global Open Finance marketplaces where users will be able to customize financial services in real-time. Unlike modern models where the client needs to independently search for the best offers, analyze the terms, and request approval, the Open Finance marketplace completely eliminates manual selection.

1.5. AI ecosystems in finance will develop in three possible scenarios:

1.5.1. Centralized AI ecosystems. In this scenario, major banks and the Central Bank will begin to control the AI infrastructure, ensuring transparency and security. In such a case, AI will be able to perform centralized financial flow analysis and automated AML control.

1.5.2. Decentralized AI ecosystems. This scenario involves the use of autonomous AI platforms that can operate without the involvement of banks, integrating with DeFi. In this case, users will receive financial services without intermediaries, and decentralized APIs will allow them to use any financial services without the permission of traditional banks.

1.5.3. Hybrid AI ecosystem. The most likely scenario is a combination of centralized and decentralized solutions. In such a model, banks would retain control over the regulation of AI solutions while also beginning to use DeFi tools that combine traditional banking services with blockchain technologies.

Certainly, not all of the aforementioned promising directions can be implemented in the practical activities of regional banks.

[4] The concept of implementing Open APIs in the financial market. URL: https://www.cbr.ru/Content/Document/File/142114/concept_09–11–2022.pdf. (accessed on 20.02.2025).

[5] Meta-learning. Applications in AutoML and Data Science. 9785937002006, 9783030670238. URL: https://dokumen.pub/automl-9785937002006–9783030670238.html (accessed on 20.02.2025).

Table 1

Directions for the Development of AI and Open API in the Banking Sector and the Possibilities of Their Implementation by Regional Banks

Direction	Description of the direction	Advantages for banks	Real possibility of implementation by the bank
1. 1. Cognitive Financial Systems	Hybrid machine learning, meta-learning, self-adjusting investment strategies	Personalization of banking products, dynamic pricing, reduction of operational risks	Medium — requires significant investment in AI infrastructure, but is possible through partnerships with FinTech companies
1.2. Quantum AI	Automatic interest rate adjustment, AI analysis of macroeconomic indicators	Advantages in credit scoring and investments	Very low — high implementation cost, only available to the largest bank
1.3. API 3.0 — Adaptive and Self-Regulating APIs	Forecasting multidimensional correlations, probabilistic analysis of banking risks	Flexibility of new banking services, simplification of interaction with FinTech	High — most API solutions can be integrated through partner programs and cloud technologies
1.4. Global Open Finance Marketplaces	Automatic adaptation to customer requests, integration with various FinTech services	Easier integration with other banks and FinTech, development of cross-products	Medium — requires digital transformation but is accessible through Open Banking cloud platforms
1.5.1. Centralized AI Ecosystems	Creating platforms for automated selection of banking products	Ensuring compliance, reducing banking risks	High — requires compliance with Central Bank standards, but is accessible to most banks
1.5.2. Decentralized AI Ecosystems	Government regulation of AI financial management, AML control	The ability to work directly with clients without intermediaries, simplifying lending	Low — requires legislative changes and a bank's high digital maturity
1.5.3. Hybrid AI Ecosystems	Autonomous AI platforms, DeFi tools	The ability to adapt to new technologies without losing control	Medium — partial implementation is possible using third-party AI platforms

Source: Compiled by the author.

Quantum AI remains inaccessible to small and medium-sized banks due to its high cost and complexity of implementation. Unlike him, APIs 3.0, which use multidimensional correlations and probabilistic analysis of banking risks, can be integrated relatively easily thanks to cloud technologies and partnership programs. Hybrid AI ecosystems, combining traditional and decentralized approaches, can be partially implemented, provided third-party AI platforms are used. Thus, the most realistic directions for banks

are API integration, centralized AI ecosystems, and partial digitalization using Open Finance.

We have listed only a small part of the directions for AI and Open API development. Considering the aforementioned innovations, it is necessary to start thinking today about how the role of banks will change and what place they will occupy in the market of the future. How will their position change if banking services are fully integrated into global decentralized platforms, stripping banks of their monopoly on financial transactions? What consequences will the disappearance of traditional bank accounts and cards have if funds take the form of smart contracts? If banks are unable to adapt to these changes, will they face a mass exodus of customers and lose their role in the financial intermediation system?

To secure their future in the new landscape, banks need to assess the financial and technical resources required to implement AI and Open APIs. This requires a detailed cost analysis, including infrastructure upgrades, integration with existing systems, staff training, and support for new technological solutions.

Let's consider the main cost items that need to be taken into account during the digital transformation of regional banks in *Table 2*.

As the cost calculation in *Table 2* shows, their volume for regional banks is quite significant. Total investments can range from 3 million to 8 million dollars, and in large banks, up to 0 million and higher.

In conditions of insufficient resources, regional banks can take advantage of the FinTech Association's initiatives for Open API integration.[6] These documents allow banks to optimally change their business model, transitioning from costly traditional processes to an ecosystem model with minimal investment. By using standardized Open API interfaces, banks can integrate with existing external platforms, leveraging ready-made solutions and advanced technologies. This ensures process automation, reduced operating costs, and a quick return on investment. Additionally, participation in the Association's pilot projects and educational programs allows banks to avoid costly mistakes and utilize funds as efficiently as possible.

The following can be considered as directions that could potentially contribute to the integration of AI and Open APIs into banking processes:

1. *Technical infrastructure: transitioning to cloud computing and abandoning capital-intensive solutions*. Traditionally, banks use closed IT systems with limited integration with external services. In new digital strategies, this approach needs to be completely rethought, and an API infrastructure should be created that allows customers, partners, and third-party developers to integrate banking services into their systems. Banks transitioning from closed IT infrastructure to APIs allows them to reduce their operational and investment costs. Firstly, using cloud solutions allows you to minimize initial capital investments in server capacity and specialized equipment, replacing them with relatively inexpensive subscription services. This reduces the costs of purchasing and maintaining your own IT infrastructure. Secondly, Open APIs eliminate the need to develop complex software solutions independently, allowing you to use existing digital platforms and third-party developer services. As a result, the costs of maintaining and updating their own systems are reduced (a total of 230 000 dollars — see point 1.1 of *Table 2*), and the integration of innovative products is accelerated, leading to a faster return on investment.

2. Open interfaces provide banks with a simple and cost-effective way to expand their product and service lines without the expense of their own research and development. The bank is becoming a platform where partners independently create and maintain in-demand customer services, which reduces the financial burden and allows freed-up resources to be directed towards other areas of development. This opens up the possibility of transitioning from a service provider format to a "bank as a

[6] The FinTech Association has developed open API standards. URL: https://fintechru.org/press-center/publications/assotsiatsiya-fintekh-razrabotala-standarty-otkrytykh-api/ (accessed on 20.03.2025).

Table 2

Approximate Calculation of Costs for the Implementation of AI and Open API in the Context of Digital Transformation of Regional Banks

Direction	Description	Approximate costs, US dollars
1. Initial costs of implementing AI and Open API		
1.1. Technical infrastructure	Banks often operate on outdated software, which requires upgrading servers, databases, and network equipment. Implementing AI requires high-performance computing power, such as cloud solutions or on-premise data centers with graphics processing units (GPU)	Server equipment:200 000–500 000 Cloud services: 10 000–50 000 per month Data storage systems: 50 000–150 000 Network infrastructure upgrade: 30 000–100 000
1.2. Open API licensing and subscription	Many API platforms operate on a subscription model, the cost of which varies depending on the level of personalization and data processing volume	Basic API access: 5 000–20 000 per month Corporate licenses: 100 000–500 000 per year
1.3. Integration with existing systems	Most banking systems are built on outdated architectures. Integrating OpenAI requires APIs and developing new data exchange gateways	API gateway development: 100 000–300 000 Internal software updates: 200 000–500 000 IT infrastructure consulting and auditing: 50 000–100 000
1.4. Developing API models for banking	If a bank is developing its own API models, it needs machine learning and data analytics specialists. Large datasets are also needed to train the models	Data science team (5–10 people): 500 000–1 000 000 per year AI model development and testing: 300 000–700 000 Data preparation and processing: 100 000–250 000
1.5. Staff training	Training employees to work with AI solutions and APIs. IT Department Training and Development	Courses and certifications for AI and API specialists (from 5 000 to 20 000 per employee) Training staff on how to work with new customer services (50 000–200 000 depending on the number of employees) Hiring AI and API experts. The average salary for AI specialists is 120 000–250 000 per year
1.6. Business process change	Re-evaluating traditional processes. Implementing predictive analytics for forecasting customer needs	Restructuring business processes requires additional time and financial investment (from 100 000 to 1 000 000 depending on the scale of the transformation)
2. Post-implementation operational costs		
2.1. IT infrastructure support	API solutions require constant updates, monitoring, and improvements. This includes server maintenance, monitoring API performance, testing, and adjusting AI models	Server infrastructure maintenance (50 000–200 000 per year) Subscriptions to AI platforms and software updates (100 000–300 000 per year) Quality control of AI models and APIs (10 000–100 000 per year)
2.2. Staff training	APIs require employee retraining because customer interaction, data processing, and risk management are changing	Front-office employee training: 10 000–50 000 Compliance department training: 10 000–30 000
2.3. Cybersecurity	The integration of AI and APIs increases banks' vulnerability to cyberattacks. This requires new data protection mechanisms, multi-factor authentication, activity monitoring	Deploying cybersecurity systems: 200 000–500 000 Monitoring API traffic: 50 000–150 000 Implementing multi-factor authentication: 100 000–300 000

Table 2 (continued)

Direction	Description	Approximate costs, US dollars
3. Advanced stage: full ai optimization and autonomous APIs		
3.1. Creating a fully digital bank powered by AI and APIs	Hyper-adaptive APIs (API 3.0). Fully automated machine learning APIs. Integration with DeFi platforms, use of smart contracts. Centralized AI analytics for dynamic risk management	AI cash flow driving (500 000–1 500 000) Hyperadaptive APIs (300 000–1 000 000) AI risk analysis (500 000–1 500 000)
3.2. Risks of non-compliance with the requirements of the Central Bank of the Russian Federation	Ensuring compliance with the regulatory requirements of the Central Bank of the Russian Federation, international AML standards, and GDPR	Legal Expertise (50 000–150 000) Compliance systems (100 000–500 000) Internal audit of AI solutions (50 000 per year)

Source: Compiled by the author.

platform" model, enabling seamless integration with financial and non-financial services.

3. *AI Licensing and Subscription: Choosing the Optimal Level of Integration.* Using a hybrid licensing and subscription model allows for cost optimization. Corporate licenses for proprietary AI solutions require investments in development, infrastructure, and maintenance, which often exceed the capabilities of banks. An alternative to this is the application of a hybrid approach: less expensive and safer internal solutions can be used to process data and processes related to internal security and the requirements of the Central Bank of the Russian Federation. At the same time, less critical functions (customer preference analytics, marketing forecasts, scoring, processing standard inquiries) are being transferred to more accessible cloud platforms. Banks gain the ability to flexibly scale the use of AI technologies based on current needs and IT budget, avoiding unnecessary capital expenditures and minimizing the risks of confidential data leakage (reducing costs by up to 200 000 dollars in total — see point 1.2 of *Table 2*).

4. *Integration with existing systems: phased implementation of APIs and abandonment of expensive infrastructure-dependent IT solutions.* For banks with outdated IT systems, phased integration of APIs is the most rational and economically justified way to digitally modernize. A complete replacement of IT solutions requires investments that are often impossible for local banks to make. Using a gradual API gateway implementation strategy allows for minimizing upfront costs, as it doesn't require an immediate abandonment of existing infrastructure, but rather provides a smooth and cost-effective transition. Using API gateways in the first stage allows banks to quickly establish data exchange with external services and partners without a capital-intensive overhaul of their internal architecture. Then, as financial resources and technological maturity allow, the bank gradually transitions to a modular structure, replacing individual components of the outdated IT system with new, more functional solutions. This approach allows investment costs to be spread over a longer period, avoiding the need for large and expensive upgrades (totaling from 200 000 dollars — see point 1.3 of *Table 2*).

5. *Developing AI models for banking: using ready-made solutions instead of building from scratch.* Creating own AI models requires, as we calculated above, significant investments in attracting highly qualified specialists (data scientists), acquiring or renting computing power, as well as a lengthy period of model testing and training. In the context of budget constraints, such a strategy is economically disadvantageous. Instead, banks can apply

market-proven solutions offered as cloud services or licensed AI products, adapting them to their specific needs. Using ready-made AI models reduces costs, ensures rapid integration, and allows for the quick launch of new services (totaling from 300 000 dollars — see point 1.4 of *Table 2*). This also shortens the time to profitability and lowers the risk of failures associated with insufficient experience in independent development.

6. *Business process change: implementing dynamically integrated API-based models*. Traditional banking processes require lengthy setup, approval, and regulation. Using API 3.0 and intelligent automated solutions will allow for more flexible business models. Classic approaches involve strict internal rules and the need to reconfigure systems with any changes in the requirements of the Bank of Russia or market conditions. The use of API and AI technologies allows banks to quickly change internal processes, responding to changes in the market environment without costly modifications and reconfiguring the entire operating model (totaling from 100 000 dollars — see point 1.6 of *Table 2*).

7. *Optimizing IT infrastructure support costs through AI monitoring*. Banks can reduce IT infrastructure support costs through automated AI solutions for server capacity monitoring, API testing, and AI model lifecycle management. Standard approaches to infrastructure maintenance require continuous monitoring, periodic inspections, and servicing. The application of AI-based intelligent monitoring allows for the automatic real-time identification and prediction of potential equipment failures, deviations in interface operation, and degradation in AI model performance. This approach minimizes the number of routine operations and prevents downtime and failures, reduces maintenance costs, and decreases the need for additional personnel (totaling from 50 000 dollars — see point 2.1 of *Table 2*).

8. *Development of autonomous APIs and the transition to decentralized financial services*. In the long-term, banks will need to evolve from traditional centralized architecture to autonomous APIs and DeFi services. Static banking platforms that require regular intervention, maintenance costs, and upgrades will be replaced by a fully API-oriented infrastructure based on service architecture and distributed ledger technology. Such infrastructure implies the use of autonomous APIs capable of automatically interacting with external systems, quickly exchanging data, and dynamically changing product parameters. This eliminates the need for constant reprogramming and recalibration of systems, reducing the costs of keeping them up-to-date and operational.

PROMISING DIRECTIONS FOR THE DIGITAL TRANSFORMATION OF REGIONAL BANKS

In the context of the digital transformation of the banking industry, traditional forms of partnership with FinTech are no longer providing a sustainable advantage, as major market players have already put the potential of Open APIs, platform systems, and AI into practice. Under these conditions, regional banks will no longer be able to compete effectively simply by copying or catching up with existing technologies and strategies. Their future directly depends on their ability to develop fundamentally new models of interaction with FinTech, involving the creation of joint products, technology exchange, mutual integration, and going beyond traditional banking activities.

Regional banks should actively utilize the opportunities of joint innovation labs themselves, forming alliances based on the shared use of neurotechnology's, IoT solutions, blockchain platforms, and other innovative tools. As a result, they will be able to move beyond the classical banking paradigm and become full participants in the modern financial ecosystem, organically integrated into the rapidly changing conditions of the digital economy.

One of the promising directions for banking transformation is participation in AI-native banking alliances, where credit institutions are moving away from the role of centralized information repositories and transitioning to fully distributed, AI-driven digital structures.

In such alliances, AI functions not just as a tool for automating individual operations, but as an agent capable of independently analyzing market and credit risks in real-time, generating optimal lending decisions, and dynamically managing liquidity. At the same time, local banks become an integrated part of a self-learning global AI network, which ensures continuous improvement of algorithms and the prompt adaptation of banking services to changing market conditions and customer demands.

Another promising direction for the digital transformation of banks could be their integration into decentralized autonomous organizations (DAOs) that operate based on smart contract technology. Within such a model, banks lose their traditional functions as centralized intermediaries, transferring decision-making regarding lending operations, investment activities, and payment management to specialized systems. The algorithmic nature of DAO banking[7] completely eliminates the influence of the human factor on critical processes. Banks interact with customers and partners using digital tokens, which radically changes transaction costs, speeds up settlements, and enables fully automated reporting. The application of DAO banking fundamentally changes the infrastructure of banks transitioning to a decentralized network business organization that doesn't require a physical branch network or traditional bank branches.

At the same time, financial "metaverse" banking can be identified as the next evolutionary step in digital customer interaction. In this concept, the bank is no longer limited to the classic mobile app or web platform format, but is integrated directly into virtual financial spaces ("metaverses"). Banks' virtual offices in the "metaverses" are becoming points of direct and interactive contact where customers receive consultations from intelligent AI assistants, take out loans, make payments, and conduct investment transactions in a fully virtualized environment. Tokenization of assets and the application of distributed ledger technology in the "metaverses" allow banks to execute instant transactions and settle between different jurisdictions with minimal transaction costs.

Another future scenario is the disappearance of classic banking interfaces and a transition to the Embedded Finance 3.0 post-banking model.[8] In this concept, banks "dissolve" into user ecosystems, and financial transactions occur automatically within social networks, marketplaces, and digital platforms. Bank accounts, cards, and mobile apps are becoming redundant as AI agents begin to operate in the background, independently analyzing a user's financial needs and automatically executing necessary transactions. As a result of this transformation, banks lose their visible independence, becoming invisible providers of financial services, deeply integrated into digital platforms and online services. This fundamentally changes the role of banks in the financial infrastructure, transforming them from traditional financial intermediaries into infrastructure service providers that ensure seamless, convenient, and fully automated execution of all financial transactions in users' daily lives.

The interaction between banks and FinTech opens up the prospect of participating in neural network credit DAOs, where credit decisions are formed not by banking structures, but by distributed AI algorithms. In such an architecture, traditional scoring approaches are replaced by dynamic AI models that assess creditworthiness based on a comprehensive analysis of a customer's social behavior, transactional activity, and cognitive patterns.

The final stage in the evolution of alliances between regional banks and FinTech companies could be the utilization of the capabilities of companies that possess quantum computing and data encryption technologies. The use

[7] Decentralized Autonomous Organization (DAO): Definition, Purpose, and Example. URL: https://www.investopedia.com/tech/what-dao/ (accessed on 20.02.2025).

[8] Embedded Finance and BaaS: reflections on 2024 and what lies ahead. URL: https://thepaypers.com/expert-opinion/embedded-finance-and-baas-reflections-on-2024-and-what-lies-ahead-1271178 (accessed on 20.02.2025).

of such systems will allow for an increase in the security level of banking transactions, ensuring complete invulnerability to any hacking attempts and unauthorized access. Simultaneously, this will ensure instant processing of the vast amounts of data needed for risk analysis, liquidity management, and real-time interbank settlements.

Thus, banks need to not just adapt to existing digital standards, but completely rethink their strategy for interacting with FinTech. The application of AI, decentralized platforms, "metaverses", neurointerfaces, IoT banking, and quantum financial networks will allow them not only to maintain their role in the market but also to reach a completely new level of digital transformation, evolving from traditional financial intermediaries into dynamic elements of the future global financial ecosystem.

CONCLUSION

The changing architecture of the banking sector today is dictated by digital transformation, which is based on AI and Open APIs. Major banks are actively implementing AI models to solve tasks such as predictive data analysis, automated detection of anomalous transactions, and improving the accuracy of financial forecasting, which gives them a high speed of response to changes in the market situation and personalization of customer services. Unlike them, banks in the regions predominantly continue to use traditional approaches, including static scoring models and analytical procedures limited by the capabilities of the software they use. At the same time, the application of Open API provides local banks with the opportunity to bridge the technological gap. Open APIs allow small banks to integrate with external digital platforms and FinTech companies, gaining access to modern data processing technologies, new products, and customer service channels without significant investment.

To overcome these challenges and successfully implement AI and Open APIs, such banks require a fundamentally different approach to organizing digital transformation. The optimal strategy becomes a phased modernization of the IT architecture with a gradual transition to cloud and modular API-based solutions, which allows for minimizing capital expenditures and reducing the workload on in-house specialists. Partnerships and strategic collaboration with FinTech companies and external technology providers offer the opportunity to utilize ready-made digital solutions, avoiding the costs of independent development.

Participating in hybrid AI ecosystems and alliances, where traditional financial services are closely integrated with third-party digital services, will allow banks to quickly bridge the technological gap and minimize innovation implementation costs. The application of AI and Open APIs should become not just a trend, but a priority task for regional banks, ensuring their sustainability and competitiveness.

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