

## MAIN CHALLENGES OF IMPLEMENTING DIGITAL TECHNOLOGIES IN BANKING ACTIVITIES

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**Abstract.** This article examines the main challenges associated with the implementation of digital technologies in banking activities. The study analyzes the current state of digitalization in the banking sector of Uzbekistan and evaluates the opportunities and difficulties arising from the integration of digital technologies into financial institutions. The research also considers statistical data and analytical materials related to the development of digital banking services in Uzbekistan.

**Keywords:** digital banking, financial technologies, banking system, digital transformation, cybersecurity, Uzbekistan banking sector

**Annotatsiya.** Mazkur maqolada banklar faoliyatida raqamli texnologiyalarni joriy etish jarayonida yuzaga keladigan asosiy muammolar tahlil qilinadi. Tadqiqotda O'zbekiston bank tizimida raqamlashtirish jarayonining hozirgi holati o'rganilib, raqamli texnologiyalarni bank faoliyatiga joriy etish jarayonida yuzaga keladigan imkoniyat va muammolar baholanadi. Xususan, texnologik infratuzilma rivojlanishi, kiberxavfsizlik masalalari, normativ-huquqiy muhit, malakali mutaxassislar yetishmovchiligi, aholi moliyaviy savodxonligi darajasi hamda raqamli transformatsiya xarajatlarining yuqoriligi kabi omillar tahlil qilinadi.

**Kalit so'zlar:** raqamli bank xizmatlari, moliyaviy texnologiyalar, bank tizimi, raqamli transformatsiya, kiberxavfsizlik, O'zbekiston bank sektori

**Аннотация.** В данной статье рассматриваются основные проблемы внедрения цифровых технологий в деятельность банков. В исследовании анализируется текущее состояние цифровизации банковского сектора Узбекистана и оцениваются возможности и трудности, возникающие при внедрении цифровых технологий в финансовых учреждениях. В работе также используются статистические данные и аналитические материалы, характеризующие развитие цифровых банковских услуг в Узбекистане.

**Ключевые слова:** цифровой банкинг, финансовые технологии, банковская система, цифровая трансформация, кибербезопасность, банковский сектор Узбекистана.

### INTRODUCTION

The digital transformation of the financial sector has become one of the defining processes of the modern economic system. The rapid development of information technologies, the expansion of internet infrastructure, and the increasing demand for fast and convenient financial services have significantly changed the traditional model of banking operations. In the modern economy, banks are no longer limited to classical financial intermediation; they increasingly function as technological platforms that integrate financial services with digital infrastructure. The implementation of digital technologies allows banks to optimize operational processes, improve customer experience, reduce transaction costs, and expand the accessibility of financial services for the population. However, despite the evident advantages of digitalization, the introduction of digital technologies in banking activities is accompanied by a number of complex challenges related to technological infrastructure, institutional adaptation, regulatory frameworks, cybersecurity, and human capital development.

### MAIN PART

In recent years, Uzbekistan has demonstrated noticeable progress in the digital transformation of the banking sector. Government reforms aimed at modernizing the financial system and developing the digital economy have created favorable conditions for the expansion of digital banking services. Mobile banking platforms, online payment systems, remote identification technologies, and fintech solutions have become increasingly widespread among financial institutions.

According to data from the Central Bank of the Republic of Uzbekistan, the number of users of remote banking services has increased sharply over the past few years. By 2024, the number of individuals using mobile and internet banking services exceeded forty million users, which indicates the rapid integration of digital technologies into everyday financial activities. The number of issued bank cards has also grown significantly, surpassing fifty million units, while the volume of electronic transactions conducted through payment systems and digital platforms continues to expand each year[1].

Despite the positive dynamics observed in the development of digital banking infrastructure, the practical implementation of digital technologies remains uneven across different segments of the banking system. One of the fundamental challenges is the insufficient level of technological infrastructure in certain regions. Digital banking services depend heavily on stable internet connectivity, high-speed data transmission networks, and reliable telecommunications systems.

Although internet penetration in Uzbekistan has increased significantly, regional disparities remain visible. Urban areas demonstrate a higher level of technological readiness compared to rural regions, where limited internet access and insufficient digital infrastructure restrict the widespread use of online banking services. As a result, a significant portion of the population still relies on traditional banking channels, which slows the overall pace of digital transformation[2].

Another major problem associated with the introduction of digital technologies in banking activities is the shortage of qualified specialists capable of managing complex financial technologies. Digital banking systems require professionals who possess interdisciplinary competencies in finance, programming, data analytics, and cybersecurity. However, the rapid growth of fintech solutions has created a gap between the demand for highly qualified specialists and the available supply in the labor market. Many banks experience difficulties recruiting experts in areas such as artificial intelligence, blockchain technologies, and big data analysis. This shortage of qualified personnel often forces banks to rely on external technological providers or imported software solutions, which may increase operational costs and limit the development of domestic technological capacity[3].

Cybersecurity risks represent another critical dimension of digital banking development. As financial institutions increasingly rely on digital platforms, the vulnerability of banking systems to cyber threats becomes more pronounced. Unauthorized access to financial databases, identity theft, phishing attacks, and malicious software can cause significant financial losses and undermine public confidence in digital financial services. The growth of online transactions inevitably increases the exposure of banking systems to potential cyberattacks[4].

In this context, the development of robust cybersecurity mechanisms becomes an essential component of digital banking strategies. Modern banking institutions are required to implement advanced security technologies, including encryption protocols, multi-factor authentication, biometric identification, and artificial intelligence-based fraud detection systems. These measures help mitigate risks, but they also require substantial financial investments and continuous technological upgrades.

Institutional and regulatory factors also significantly influence the process of digital transformation in the banking sector. The rapid emergence of financial technologies often creates

regulatory challenges, as traditional legal frameworks may not fully correspond to the realities of digital financial markets. Regulators face the complex task of balancing two important objectives: encouraging financial innovation while simultaneously maintaining financial stability and protecting consumers.

In Uzbekistan, regulatory reforms have gradually been implemented to support the development of digital financial services. The introduction of digital payment systems, electronic money institutions, and fintech companies has expanded the financial ecosystem and increased competition in the market. At the same time, the regulatory environment is still evolving, particularly in areas such as open banking, digital assets, cross-border digital payments, and the integration of fintech companies with traditional banking institutions[5].

An additional challenge lies in the relatively low level of digital and financial literacy among certain groups of the population. Although the use of mobile applications and online banking platforms has expanded significantly, not all consumers fully trust digital financial services. Many individuals still prefer cash transactions due to concerns about security, lack of familiarity with digital technologies, or limited access to digital devices. Studies conducted by Uzbek economists indicate that a considerable share of funds transferred to payment cards is subsequently withdrawn as cash from ATMs. This behavior reflects the persistence of traditional financial habits and highlights the importance of educational initiatives aimed at increasing digital literacy and strengthening public confidence in digital banking systems.

Organizational and managerial factors within banks also influence the success of digital transformation. The introduction of digital technologies requires significant changes in internal management structures, operational processes, and corporate culture. Traditional banking models were built around hierarchical organizational structures and manual processing of financial transactions. In contrast, digital banking requires flexible management systems, automation of operational procedures, and the integration of advanced information technologies. Many banking institutions face internal resistance to these changes, particularly among employees who must adapt to new technological environments and acquire new professional skills. Consequently, the process of digital transformation is not only technological but also organizational and cultural in nature[6].

Financial constraints also represent an important barrier to the rapid implementation of digital technologies. The development of digital banking infrastructure requires significant investments in information systems, cloud technologies, data processing centers, cybersecurity infrastructure, and staff training.

Large commercial banks often possess sufficient financial resources to implement large-scale digital transformation programs, while smaller banks may encounter difficulties financing such initiatives. This disparity may create technological asymmetry within the banking sector, potentially affecting the competitive balance between financial institutions.

At the same time, the expansion of digital technologies creates new opportunities for improving the efficiency of banking operations. Digital platforms significantly reduce transaction costs, accelerate financial operations, and improve customer accessibility to banking services. Online banking allows customers to perform financial transactions remotely without visiting bank branches, which increases convenience and reduces administrative costs for banks. The integration of big data analytics also enables banks to better assess credit risks, personalize financial services, and develop innovative financial products tailored to the needs of different customer segments[7].

Furthermore, digital banking technologies play an important role in promoting financial inclusion. In many developing economies, including Uzbekistan, a considerable portion of the population previously had limited access to formal financial services. Digital platforms, mobile payment systems, and online lending services enable banks to reach new groups of customers,

including residents of remote regions, small entrepreneurs, and young consumers who actively use mobile technologies. The expansion of digital financial services contributes to the development of small and medium-sized businesses, increases the efficiency of financial intermediation, and supports the broader development of the national digital economy[8].

In the long term, the successful implementation of digital technologies in banking activities will depend on the coordinated interaction between financial institutions, regulatory authorities, educational institutions, and technology companies. Investments in technological infrastructure, development of human capital, improvement of cybersecurity mechanisms, and enhancement of financial literacy programs are essential conditions for sustainable digital transformation. At the same time, regulatory frameworks must remain flexible enough to accommodate the rapid development of fintech innovations while maintaining financial stability and protecting consumer rights.

### CONCLUSION

In conclusion, the introduction of digital technologies in banking activities represents a complex process that combines technological innovation with institutional transformation. The experience of Uzbekistan demonstrates that while significant progress has been achieved in the development of digital financial services, a number of structural challenges still limit the full realization of digital banking potential. These challenges include infrastructural disparities, shortages of qualified specialists, cybersecurity risks, regulatory complexities, organizational resistance, and financial constraints associated with technological modernization. Addressing these issues requires comprehensive reforms aimed at strengthening technological capacity, improving regulatory frameworks, expanding digital literacy, and supporting innovation within the banking sector. The effective resolution of these challenges will not only enhance the competitiveness of banks but will also contribute to the broader development of the digital economy and sustainable economic growth.

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