

STAGES OF DIGITALIZATION OF COMMERCIAL BANKING PRACTICES IN UZBEKISTAN: EVOLUTION, EMPIRICAL EVIDENCE AND DEVELOPMENT PROSPECTS

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Abstract

This article investigates the evolution and current stage of digitalization of commercial banking practices in Uzbekistan and proposes a five-stage periodization of the sector's transition from branch-centred banking to an emerging data-driven financial ecosystem. The study combines institutional analysis, descriptive statistics, comparative analysis and bank-level evidence. Official statistics of the Central Bank of the Republic of Uzbekistan are used to examine the scale and dynamics of remote banking adoption, while the National Strategy for the Development of Financial Technologies for 2026–2030 is analysed as the institutional framework shaping the next stage of transformation. The findings show that digitalization in Uzbekistan has moved beyond the automation of individual operations: technology increasingly affects customer acquisition, payments, product delivery, risk assessment, operational architecture and the competitive positioning of commercial banks. The article argues that the next stage will depend on interoperability, open banking, artificial intelligence, cybersecurity, data governance and cooperation between banks and FinTech firms. A Digital Banking Performance Framework is proposed for assessing digital maturity through customer adoption, transaction migration, digital sales, process automation, reliability, security and customer experience. The results have practical implications for commercial banks, regulators and policymakers in emerging financial markets.

Keywords: digital banking; commercial banks; digital transformation; FinTech; remote banking; mobile banking; digital payments; open banking; artificial intelligence; financial ecosystem; Uzbekistan.

JEL Classification: G21, G28, O32, O33, L86.

Аннотация

В статье исследуются эволюция и современный этап цифровизации деятельности коммерческих банков Узбекистана и предлагается авторская пятиэтапная периодизация перехода от филиально-ориентированной банковской модели к формирующейся финансовой экосистеме, основанной на данных и цифровых технологиях. Методология включает институциональный, сравнительный и статистический анализ, а также изучение банковской практики. На основе официальных данных Центрального банка Республики Узбекистан оцениваются масштабы дистанционного банковского обслуживания и структурные изменения в каналах взаимодействия с клиентами. Показано, что цифровизация вышла за рамки автоматизации отдельных операций и все в большей степени определяет привлечение клиентов, платежи, разработку продуктов, управление рисками и операционную модель банков. Следующий этап трансформации связывается с развитием открытого банкинга, искусственного интеллекта, кибербезопасности, управления данными и сотрудничества банков с FinTech-компаниями. Предложена система показателей для оценки цифровой зрелости коммерческих банков.

Ключевые слова: цифровой банкинг; коммерческие банки; цифровая трансформация; FinTech; дистанционное банковское обслуживание; мобильный банкинг; цифровые платежи; открытый банкинг; искусственный интеллект; финансовая экосистема; Узбекистан.

Annotatsiya

Maqolada O'zbekiston tijorat banklari faoliyatini raqamlashtirishning evolyutsiyasi va zamonaviy bosqichi tadqiq etilib, filialga asoslangan an'anaviy bank modelidan ma'lumotlar va raqamli texnologiyalarga tayanuvchi moliyaviy ekotizimga o'tishning besh bosqichli mualliflik davrlashtirishi taklif etiladi. Tadqiqot metodologiyasi institutsional, qiyosiy va statistik tahlil hamda banklar amaliyotini o'rganishni o'z ichiga oladi. O'zbekiston Respublikasi Markaziy bankining rasmiy ma'lumotlari asosida masofaviy bank xizmatlarining ko'lamini va mijozlar bilan ishlash kanallaridagi tarkibiy o'zgarishlar baholanadi. Natijalar raqamlashtirish alohida operatsiyalarni avtomatlashtirish doirasidan chiqib, mijozlarni jalb qilish, to'lovlar, mahsulotlarni yetkazib berish, risklarni baholash va banklarning operatsion modelini o'zgartirayotganini ko'rsatadi. Keyingi bosqich ochiq banking, sun'iy intellekt, kiberxavfsizlik, ma'lumotlarni boshqarish va bank-FinTech hamkorligining rivojlanishiga bog'liq. Tijorat banklarining raqamli yetukligini baholash uchun ko'rsatkichlar tizimi taklif etilgan.

Kalit so'zlar: raqamli banking; tijorat banklari; raqamli transformatsiya; FinTech; masofaviy bank xizmatlari; mobil banking; raqamli to'lovlar; ochiq banking; sun'iy intellekt; moliyaviy ekotizim; O'zbekiston.

1. Introduction

Digital transformation has become a structural driver of change in global banking. The diffusion of smartphones, cloud computing, application programming interfaces (APIs), artificial intelligence (AI), advanced analytics and platform technologies has changed both the distribution of financial services and the internal architecture of financial institutions. The traditional competitive advantages of banks—large branch networks, physical proximity and information accumulated through long-standing customer relationships—are increasingly complemented, and in some segments challenged, by technological capabilities, data quality, speed of product development and digital customer experience.

For emerging economies, digital banking has an additional development dimension. Remote channels can reduce the fixed cost of reaching geographically dispersed customers, lower transaction costs, formalize financial flows and support financial inclusion. At the same time, rapid digitalization creates new risks associated with cyber threats, operational resilience, third-party technology dependence, consumer protection and the governance of personal and transactional data.

Uzbekistan is an instructive case. During the last decade, banking reforms have coincided with the expansion of electronic payments, smartphone penetration, remote customer services and the growth of a domestic FinTech ecosystem. The policy agenda has also become more explicit. The National Strategy for the Development of Financial Technologies for 2026–2030 defines priorities for strengthening digital financial infrastructure, attracting investment and developing human capital, while the Central Bank operates a regulatory sandbox for testing innovative financial products under controlled conditions.

The purpose of this article is to systematize the stages of digitalization of commercial banking practices in Uzbekistan, assess the empirical evidence of digital adoption and identify the institutional and managerial priorities for the next stage. The contribution of the study is threefold. First, it proposes a five-stage periodization tailored to Uzbekistan's banking evolution. Second, it links technological changes to changes in bank business models rather than treating digitalization as a purely technical phenomenon. Third, it proposes a practical Digital Banking Performance Framework that can be used by banks and regulators to assess digital maturity.

2. Literature Review and Conceptual Background

The literature distinguishes digitization, digitalization and digital transformation. Digitization is the conversion of analogue information into digital form. Digitalization refers to the use of digital technologies to improve existing processes, while digital transformation implies a deeper redesign of strategy, organizational structure, customer interaction and value creation. This distinction is especially relevant in banking: the installation of new software is not equivalent to redesigning the lending process, and a mobile application alone does not necessarily imply a digitally transformed business model.

Vives (2019) shows that technological disruption affects banking competition, efficiency and customer welfare, while also changing the strategic interaction between incumbent banks, FinTech companies and BigTech firms. The broader FinTech literature similarly emphasizes disintermediation, re-intermediation, platform models, data-driven services and the growing importance of regulation. In this context, digital transformation should be evaluated through economic outcomes rather than technology adoption alone.

For the purposes of this study, the evolution of banking digitalization is conceptualized as: Traditional Banking → Process Automation → Multichannel Banking → Digital Banking → Platform Banking → Financial Ecosystem. The economic impact can be decomposed into five dimensions: cost efficiency, revenue expansion, customer experience, risk efficiency and financial inclusion. These dimensions provide the conceptual basis for the empirical and policy analysis below.

3. Research Methodology

The research applies a mixed descriptive and institutional methodology. First, an institutional analysis is used to identify changes in the regulatory and technological environment of Uzbekistan's banking sector. Second, descriptive statistics from the Central Bank of the Republic of Uzbekistan are used to assess the expansion of remote banking. Third, comparative analysis is used to distinguish successive stages of digital maturity. Fourth, bank-level evidence is employed to illustrate heterogeneity in digital adoption. The study does not claim causal identification; instead, it provides a structured empirical assessment and a conceptual periodization that can serve as a basis for subsequent econometric research.

The principal quantitative indicator used in the article is the number of customers using remote banking systems. Because registered remote-banking users are not identical to monthly active users, the indicator should be interpreted as a measure of access and adoption capacity rather than transaction intensity. This limitation is explicitly considered in the interpretation of results.

3.1. Proposed periodization

Stage	Dominant change	Technology/infrastructure	Banking model
Initial automation	Internal process automation	Core banking, databases, interbank IT	Branch-centred
Electronic payments	Migration from cash to electronic instruments	Cards, ATMs, POS, payment infrastructure	Electronic banking
1. Remote banking	Customer access outside branches	Internet and mobile banking	Multichannel
2. Digital transformation	End-to-end redesign of customer journeys	Remote onboarding, analytics, automation	Digital/mobile-first
3. Ecosystem transformation	Interoperable data-driven services	APIs, open banking, AI, FinTech platforms	Platform/ecosystem

4. Evolution of Banking Digitalization in Uzbekistan

4.1. Stage I: Initial automation of banking operations

The first stage was dominated by the automation of internal banking processes. Information technologies were introduced to improve accounting, payment processing, reporting, customer databases and interbranch operations. The customer experience remained predominantly physical, but the internal technological foundation required for subsequent remote services was established. Economically, the main effect was an improvement in processing capacity and information consistency rather than a fundamental change in the distribution model.

4.2. Stage II: Development of electronic payment infrastructure

The second stage was associated with the wider use of payment cards, ATMs, POS terminals and electronic settlement mechanisms. The importance of this stage lies not only in reducing dependence on cash but also in changing customer behaviour. Repeated interaction with electronic payment instruments increased familiarity with non-cash financial services and generated structured transactional data. In strategic terms, electronic payment infrastructure became the bridge between internal bank automation and customer-facing digital banking.

4.3. Stage III: Expansion of remote and mobile banking

The expansion of internet and mobile banking marked a major change in the distribution of banking services. Customers increasingly gained the ability to monitor balances, transfer funds, pay utilities, manage cards, repay loans and access other services without visiting a branch. The economic logic of this stage is straightforward: once the fixed technological infrastructure is established, the marginal cost of processing an additional digital transaction can be substantially lower than the cost of an equivalent branch-based interaction. Remote banking also changes customer expectations by making 24/7 accessibility a standard feature rather than a premium service.

4.4. Stage IV: Digital transformation of bank business models

At the fourth stage, digitalization moves from channels to the entire customer journey. A genuinely digital bank redesigns customer acquisition, identification, scoring, product selection, approval, transaction execution, service and cross-selling as an integrated process. Technology therefore becomes part of the bank's core operating model. Competition increasingly shifts from branch location and physical scale toward application quality, speed, reliability, personalization, product integration and the ability to use data in real time.

4.5. Stage V: Open banking, AI and financial ecosystems

The emerging fifth stage is characterized by interoperability and ecosystem logic. Open APIs can allow regulated third parties to interact with banking services, subject to consent and security requirements. AI can support fraud detection, credit assessment, customer segmentation, conversational interfaces and personalized recommendations. Data analytics can improve early-warning systems and product design. FinTech partnerships can accelerate innovation where building every capability internally would be inefficient. Uzbekistan's 2026–2030 FinTech strategy and regulatory sandbox indicate that this ecosystem stage is becoming an explicit policy priority.

5. Empirical Evidence: Expansion of Remote Banking

Official Central Bank statistics provide clear evidence of the scale of remote banking adoption. The table below compares selected banks at the beginning of 2025 and on 1 October 2025. The

figures include legal entities, individual entrepreneurs and individuals registered in remote banking systems.

Bank	Jan 2025	Oct 2025	Change
International Bank	511,760	244,243	9.2%
Uzbek Industrial and Construction Bank	310,942	300,036	0.8%
Agrobank	942,125	275,420	8.0%
Ipoteka-bank	861,208	741,046	2.8%
Xalq Bank	895,153	194,772	3.8%
Ipak Yuli Bank	342,193	578,437	7.0%

The figures demonstrate both scale and heterogeneity. Xalq Bank exceeded 8.19 million registered remote-banking customers by 1 October 2025, while Ipoteka-bank and Ipak Yuli Bank also recorded substantial expansion relative to January. At the same time, declines in registered users at some banks show that raw user counts should not automatically be interpreted as a monotonic measure of digital performance. Changes may reflect database cleaning, customer migration, changes in counting methodology, product restructuring or other bank-specific factors. For international comparison and management purposes, monthly active users, digital transaction volume, digital sales and customer engagement would therefore be stronger complementary indicators.

This observation is important for research design. The digitalization of banking should not be measured only by the number of registered users. A bank may have a large digital customer base but low engagement, weak digital sales or high service costs. Conversely, a smaller institution may have a highly active and profitable digital customer base. Consequently, the next generation of banking statistics should increasingly distinguish access, activity, transaction intensity and value creation.

6. How Digitalization Changes the Economics of Commercial Banking

Digitalization affects the cost structure of banks by shifting routine transactions from labour-intensive physical channels to automated channels. A useful management indicator is the digital migration ratio: $\text{Digital Migration Ratio} = \text{Digital Transactions} / \text{Total Transactions} \times 100$. An increasing ratio can indicate successful channel migration, although it should be evaluated together with system availability, fraud losses and customer satisfaction.

Digitalization can also change revenue generation. Mobile interfaces create opportunities for contextual cross-selling, embedded payments, personalized savings products and faster loan origination. The relevant strategic shift is from selling isolated products to managing the customer's financial relationship across multiple needs. This can increase customer lifetime value when supported by responsible data use and suitable products.

Risk management is another important channel. Transaction data, behavioural information and automated monitoring can strengthen fraud detection, credit scoring and early-warning systems. However, model risk and data bias become more important as automated decision-making expands. Banks therefore need governance arrangements that combine technological innovation with explainability, validation and human oversight.

Finally, digital banking can support financial inclusion by reducing the need for physical proximity to a branch. The strongest effect is likely to occur when digital identity, reliable payment infrastructure, affordable connectivity and appropriate consumer protection develop together. Technology alone cannot eliminate all barriers to financial inclusion, but it can substantially reduce distribution costs.

7. Customer-Centric Banking and the Data-Driven Model

Traditional product-oriented banking typically begins with the institution's product catalogue: deposits, loans, cards and transfers. Customer-centric digital banking begins with customer needs and observable financial behaviour. The sequence changes to: Customer Data → Analysis → Need Identification → Personalized Offer → Digital Delivery → Feedback → Continuous Improvement.

This model has implications for both retail and corporate banking. For individuals, transaction patterns can support more relevant budgeting tools, savings recommendations and responsible credit offers. For enterprises, digital banking can integrate payments, payroll, cash-flow management, accounting interfaces and financing. The bank therefore evolves from a transaction processor into a broader financial operating platform.

The strategic asset in this model is not data volume by itself but the ability to transform high-quality data into timely, secure and economically useful decisions. This requires investment in data architecture, governance, analytics talent and clear rules on consent and privacy.

8. Digital Banking Performance Framework

To improve the measurement of digital maturity, this article proposes a multidimensional framework. The framework avoids equating digitalization with the mere existence of a mobile application and instead links technology adoption to measurable operational and customer outcomes.

Dimension	Indicator	Interpretation
Customer adoption	Active digital users / total customers	Depth of digital adoption
Transaction migration	Digital transactions / total transactions	Migration from physical channels
Digital sales	Products sold digitally / total products sold	End-to-end digital capability
Cost efficiency	Cost per digital transaction	Economic efficiency of channels
Process automation	Automated key processes / total key processes	Back-office transformation
Customer experience	Digital NPS / satisfaction score	Quality of customer interaction
Reliability	Digital-channel uptime	Operational resilience
Security	Fraud losses / digital transaction value	Security effectiveness
Innovation	New digital products or API integrations	Innovation capacity

9. Key Challenges for Uzbekistan

Cybersecurity is the first major challenge. As more financial activity moves online, cyber risk becomes a board-level strategic risk. Authentication, transaction monitoring, incident response, security testing and customer awareness must evolve continuously.

The second challenge is data governance. Open banking and AI increase the economic value of data but also increase the consequences of poor data quality, unauthorized use or weak access controls. Banks need clear ownership, classification, retention, consent and model-governance policies.

The third challenge is legacy infrastructure. Older core systems may limit real-time processing and slow integration with APIs and new digital products. Modernization requires careful sequencing because large-scale migration can itself create operational risk.

The fourth challenge is human capital. Digital banking requires specialists in cybersecurity, data science, AI, product management, UX, API architecture and digital risk. The national FinTech strategy's emphasis on human-resource development is therefore economically significant.

The fifth challenge is regulatory adaptation. Regulation must preserve financial stability, competition, consumer protection and data security without unnecessarily preventing experimentation. Regulatory sandboxes can be useful when they are connected to clear pathways from testing to authorization.

10. Discussion

The evidence supports the view that Uzbekistan's banking digitalization is evolutionary rather than a single technological leap. Each stage creates capabilities required for the next: internal automation enables electronic processing; electronic infrastructure supports remote channels; remote channels generate digital customer relationships; those relationships create data and scale for business-model transformation; and mature digital platforms create the conditions for open, interoperable ecosystems.

The role of technology also changes across stages. Initially, technology is a support function. During the multichannel stage, it becomes a distribution channel. In the digital transformation stage, technology and data become part of the core business model. This progression explains why simply increasing IT expenditure does not guarantee successful transformation. Governance, process redesign, customer experience and measurable economic outcomes are equally important.

For Uzbekistan, the policy transition toward a national FinTech strategy is particularly important because it broadens the focus from individual bank modernization to the architecture of the financial ecosystem. The competitive frontier will increasingly depend on secure interoperability, innovation infrastructure, talent and the ability of banks and FinTech firms to cooperate while maintaining prudential standards.

11. Policy and Managerial Recommendations

- Commercial banks should redesign priority customer journeys end-to-end rather than merely digitizing individual steps of legacy processes.
- Regulators and market participants should develop secure, standardized approaches to APIs and open banking, including consent, authentication, liability and data-protection rules.
- Banks should establish enterprise-wide data governance and AI governance before scaling automated decision-making.
- Digital transformation programs should be assessed through active usage, transaction migration, digital sales, unit costs, reliability and customer experience—not only through registered users.
- Cybersecurity and operational resilience investment should increase in parallel with the growth of digital transaction volumes.
- Bank–FinTech cooperation should be encouraged through controlled experimentation, partnerships and transparent regulatory pathways.
- Human-capital development should focus on interdisciplinary skills combining finance, technology, risk and product management.

12. Conclusion

The digitalization of commercial banking practices in Uzbekistan has progressed from internal automation to electronic payments, remote banking, digital business-model transformation and an emerging ecosystem stage. The five-stage periodization proposed in this article demonstrates that the meaning of digitalization changes as the sector matures: technology moves from supporting existing operations to determining how banks acquire customers, deliver products, manage risks and compete.

Official statistics confirm that remote banking has achieved substantial scale. However, the analysis also shows why registered user numbers alone are insufficient for assessing digital maturity. Future evaluation should focus increasingly on active use, digital transaction intensity, digital sales, process automation, cost efficiency, customer experience, resilience and security.

The next phase of Uzbekistan's banking transformation will be shaped by the implementation of the National Strategy for the Development of Financial Technologies for 2026–2030, the evolution of open banking and API standards, the responsible use of AI, stronger cybersecurity and data governance, and deeper cooperation between commercial banks and FinTech firms. The strategic objective should therefore be broader than the creation of additional digital channels. It should be the development of a secure, interoperable, competitive and customer-oriented digital financial ecosystem.

The main scientific implication is that banking digitalization should be studied as a transformation of economic organization rather than merely as technological modernization. Future research can extend this framework through panel data on bank-level digital activity, cost-to-income ratios, profitability, branch intensity and customer engagement in order to estimate the causal impact of digitalization on bank efficiency and financial inclusion.

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