

FACULTY OF ECONOMY AND TOURISM
DEPARTMENT OF ECONOMY
REVIEW

Group.....

Student name and surname.....

Theme of coursework.....

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Composition of the course work.....

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List of questions asked to the student in the defense of the course work

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Table and amount of graphic material (indicator of important drawings)

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Pros of course work.....

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Disadvantages of coursework.....

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Assessment of the course work

The name and signature of the head of the course work.....

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Introduction

The digitalization of the global economy has given rise to numerous innovations in financial technology, and among the most transformative is the emergence of mobile payment systems. As mobile phones become increasingly widespread and accessible, they are being leveraged as tools not only for communication but also for conducting financial transactions. This transformation is contributing to the modernization of economies and creating new opportunities for inclusive economic growth.

Mobile payment systems allow users to make financial transactions through mobile devices such as smartphones and tablets. These transactions include paying for goods and services, transferring money, and managing accounts through mobile applications or SMS-based systems. Their rapid growth and popularity can be attributed to key features such as speed, convenience, accessibility, and security. These qualities are especially significant in environments where traditional banking services are not easily accessible or where there is a desire to reduce the use of physical cash.

The importance of mobile payments lies in their ability to reduce barriers to financial services. People in rural or underserved areas can access a variety of financial tools without needing to travel long distances to banks. Moreover, mobile payment systems offer an efficient alternative for business transactions, supporting e-commerce, retail, and service sectors by providing instant and traceable payment options. This fosters trust among consumers and suppliers, simplifies accounting, and reduces operational costs. In addition, governments benefit from mobile payments by improving transparency, reducing corruption, and streamlining tax collection.

Research shows that mobile payments are composed of several interlinked components. These include mobile applications, user identification systems such as PIN codes or biometric data, server infrastructure that handles transaction requests, and secure data encryption technologies. Together, these elements ensure the safe and smooth operation of mobile payment systems, encouraging greater adoption by both individuals and businesses. Financial institutions, telecommunication companies, and

fintech startups collaborate to build and maintain this infrastructure, often with support from regulatory bodies.

The evolution of mobile payment technology has been gradual, starting with relatively basic systems. Early mobile payments relied on text messaging (SMS) or USSD codes, which allowed users to perform simple financial operations like checking account balances or transferring funds. These systems required minimal infrastructure and were highly effective in regions with limited internet access. Although less sophisticated than today's mobile apps, they laid the foundation for the more advanced and user-friendly platforms currently in use.

In recent years, countries around the world have experienced significant changes in the use and development of mobile payment technologies. In China, for example, mobile payments have reached remarkable levels of integration into everyday life. Platforms like Alipay and WeChat Pay have become essential tools for purchasing items, paying utility bills, making investments, and even interacting with government services. These systems are not only used by individuals but also by small businesses, large corporations, and government institutions. Their success is largely driven by strong consumer trust, regulatory support, and a highly competitive fintech environment.

Comparatively, Uzbekistan is undergoing a dynamic transformation in its approach to digital finance. With improvements in internet connectivity and rising smartphone usage, mobile payments have started to play a vital role in the country's financial ecosystem. Digital platforms such as PayMe, Click, and Apelsin are now widely used for day-to-day transactions, including paying for utilities, shopping online, and sending peer-to-peer transfers. These services are particularly appealing due to their ease of use and the growing integration with banking services and retail systems.

Uzbekistan's experience shows that the successful implementation of mobile payments depends not only on technological readiness but also on public awareness, financial literacy, and regulatory support. The rise of local fintech companies, partnerships with banks, and government policies that promote digital financial services have collectively contributed to the expansion of the mobile payments sector.

Moreover, the growing competition among service providers has led to improvements in user experience, security, and service availability, further accelerating adoption.

Mobile payment infrastructure in Uzbekistan continues to develop rapidly. Key stakeholders, including financial regulators, mobile operators, and service providers, are working together to improve system reliability, integrate advanced technologies such as QR code payments, and ensure compliance with international security standards. As this infrastructure expands, it is expected to stimulate innovation across various sectors of the economy, including retail, transport, education, and healthcare.

The growing reliance on mobile payments reflects broader economic trends such as the shift toward cashless transactions, the rise of digital platforms, and the need for efficient financial systems that support both formal and informal economic activities. These systems also play a role in improving financial inclusion by bringing unbanked populations into the formal financial sector, allowing them to access savings, credit, and insurance products through mobile interfaces.

In light of these developments, the study of mobile payments and their economic significance is becoming increasingly important. Observations across different countries show that mobile payment systems are more than just financial tools — they represent a new mode of economic engagement that can reshape the relationship between consumers, businesses, and the state. By analyzing the features, components, and evolution of mobile payment systems, and by observing their adoption in different regions including Uzbekistan and China, it becomes possible to understand their full impact on economic activity.

Chapter 1. Organization and role of mobile payments in economic activities.

1.1 Features and importance of mobile payments.

In today's rapidly evolving digital economy, mobile payments have emerged as a transformative force, reshaping how individuals and businesses conduct financial transactions. The proliferation of smartphones and advancements in wireless technology have facilitated the widespread adoption of mobile payment systems, offering users unprecedented convenience, speed, and security. This section delves into the key features and the overarching importance of mobile payments in the contemporary financial landscape.

Ubiquitous Accessibility: Mobile payment systems provide users with the ability to perform transactions anytime and anywhere, eliminating the constraints of traditional banking hours and physical locations. This 24/7 accessibility is particularly beneficial in regions with limited banking infrastructure, promoting financial inclusion among underserved populations.

Seamless Integration with Financial Services: Modern mobile payment platforms often integrate various financial services, including peer-to-peer transfers, bill payments, and even investment options. This consolidation simplifies financial management for users, allowing them to handle multiple financial tasks within a single application.

Enhanced Security Measures: Security is paramount in mobile payment systems. Features such as biometric authentication (fingerprint and facial recognition), tokenization, and end-to-end encryption safeguard user data and transactions. For instance, tokenization replaces sensitive card information with a unique identifier, minimizing the risk of data breaches.

Real-Time Transaction Notifications: Users receive instant notifications for each transaction, enabling them to monitor their financial activities in real-time. This feature enhances transparency and allows for immediate identification of unauthorized transactions, thereby bolstering user confidence.

Compatibility with Various Devices and Platform: Mobile payment solutions are designed to be compatible with a wide range of devices and operating systems. Whether through Near Field Communication (NFC) technology or QR code scanning, users can execute transactions using smartphones, tablets, or wearable devices.

Mobile payments play a crucial role in extending financial services to unbanked and underbanked populations. In regions where traditional banking services are scarce, mobile payment platforms offer an accessible alternative, enabling individuals to participate in the formal financial system.

Economic Growth and Efficiency: By streamlining payment processes, mobile payments contribute to increased economic efficiency. Businesses benefit from faster transaction times and reduced overhead costs associated with cash handling. Moreover, the digital nature of these transactions facilitates better record-keeping and financial planning.

Reduction in Cash Dependency: The shift towards mobile payments reduces reliance on cash, mitigating risks associated with cash handling, such as theft and counterfeit currency. Additionally, digital transactions are easier to trace, aiding in efforts to combat money laundering and other illicit financial activities.

Support for E-commerce Expansion: The convenience of mobile payments has been instrumental in the growth of e-commerce. Consumers can make purchases effortlessly, enhancing the shopping experience and encouraging repeat business. This ease of transaction is a significant driver of online retail growth.

Data Collection and Personalized Services: Mobile payment platforms collect valuable transaction data, enabling businesses to analyze consumer behavior and preferences. This information can be leveraged to offer personalized services and targeted promotions, improving customer satisfaction and loyalty.

Global Adoption and Usage Statistics: The adoption of mobile payments has seen exponential growth worldwide. In 2022, the global mobile payment market was valued at \$53.5 billion, with projections estimating a compound annual growth rate (CAGR) of 35.5%, reaching \$607.9 billion by 2030. Notably, countries like China lead

in adoption rates, with 81.15% of smartphone owners utilizing mobile payment technologies.

Challenges and Considerations: Despite the advantages, mobile payments face challenges such as cybersecurity threats, technological disparities, and regulatory hurdles. Ensuring robust security measures and fostering user trust are essential for the continued growth and acceptance of mobile payment systems.

Multi-Functional Ecosystems: Modern mobile payment platforms offer much more than simple peer-to-peer transfers. They integrate:

- Utility bill payments
- Public transport ticketing
- Online and offline purchases
- Government service fees

This makes mobile payment apps like Apple Pay, Google Pay, Alipay, and local systems like PayMe or Click highly versatile and user-centric.

Regional Adoption: Asia-Pacific leads the mobile payments sector with over 35% of the market share. Countries like China and India show high penetration due to platforms like Alipay, WeChat Pay, and PhonePe.

North America and Europe follow with growing user bases, especially in urban areas using Apple Pay, Google Pay, and local fintech startups.

Benefits for Economic Activities

- **Informal Sector Inclusion:** In countries where many operate in the informal economy, mobile payments bring them into the financial system.
- **Reduced Costs:** Digital payments reduce the need for cash handling, printing, and security.
- **Transaction Speed:** Immediate settlements enhance business efficiency.
- **Tax Transparency:** Governments can better monitor and collect taxes from digitized transactions.

Mobile payments represent a significant advancement in financial technology, offering numerous benefits that enhance user experience and economic efficiency. Their features—ranging from accessibility to advanced security—underscore their importance in the modern financial ecosystem. As technology continues to evolve, mobile payments are poised to play an increasingly central role in shaping the future of financial transactions.

1.2 Components of mobile payment systems.

Mobile payment systems consist of several key components that work together to enable secure and efficient financial transactions via mobile devices. These components include:

1.Mobile Device

Mobile devices have revolutionized human interaction, access to information, and global communication. As of 2024, over 7.3 billion people worldwide use mobile phones, making them one of the most widespread technologies in history. From smartphones and tablets to smartwatches, mobile devices are not just tools for communication — they are essential for education, business, healthcare, and everyday life.

A mobile device refers to any portable electronic device that allows users to perform transactions via wireless communication. In the context of mobile payment systems, the mobile device acts as the main tool through which users initiate, authorize, and complete financial transactions.

Functions in Mobile Payment Systems:

- **User Interface:** Allows users to interact with payment apps via touch screens.
- **Transaction Initiation:** Used to start the payment process by scanning QR codes, tapping on POS terminals (NFC), or inputting payment details.
- **Authentication:** Supports biometric security (fingerprint, face ID), PIN, or pattern lock for verifying the user's identity.
- **Connectivity:** Uses Wi-Fi, mobile networks (4G/5G), or Bluetooth to connect with banks, merchants, and payment processors.
- **Digital Wallet Storage:** Securely stores payment credentials like virtual cards, loyalty points, and coupons.

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3. Payment Gateway

The digitalization of financial transactions has revolutionized the way businesses and consumers interact in the global economy. At the heart of this revolution lies the payment gateway—a technological system that securely transmits payment data and facilitates online payments between buyers, sellers, and financial institutions. As e-commerce continues to flourish, payment gateways play a pivotal role in ensuring the speed, security, and reliability of digital transactions. This essay explores the concept, functionality, types, and real-world examples of payment gateways, supported by recent data and case studies.

A payment gateway is a service that authorizes and processes payments in online and in-store transactions. It acts as an intermediary between a merchant's website or point-of-sale (POS) system and the acquiring bank, ensuring that customer payment data is securely encrypted and transmitted.

A Payment Gateway is a secure technology platform that acts as a bridge between a mobile payment application and financial institutions. It authorizes and processes payments by transmitting transaction data securely.

2. Mobile Payment Application

A mobile payment application (or mobile wallet) is a software program installed on a mobile device that allows users to store payment information and perform financial transactions electronically.



1-image: Popular payment apps.¹

4. Merchant Interface / POS (Point of Sale) System

The merchant interface is the system or tool used by businesses (merchants) to accept and process payments from customers. In mobile payment systems, this includes both physical and digital platforms where payments are completed.

5. Financial Institutions

Financial institutions play a critical role in processing and settling mobile payment transactions. They are responsible for the movement of funds between the customer and the merchant, ensuring the transaction is authorized, secure, and compliant.

6. Authentication Mechanisms

Authentication mechanisms are security processes used to verify the identity of a user before authorizing a mobile payment. These mechanisms help ensure that only

¹ Source: apptopia.com

the rightful owner of the mobile device or account can complete a transaction, thereby protecting against fraud and unauthorized access.

Main Types of Authentication.

- Biometric Authentication
- PIN Codes / Passwords
- Two-Factor Authentication (2FA)
- Device-Based Authentication
- Behavioral Biometrics
- One-Time Passwords (OTP)

7. Network Infrastructure

Network infrastructure refers to the communication systems that enable the secure and real-time transmission of data between the different components of a mobile payment system, such as the mobile device, payment gateway, and financial institutions.

- Mobile Networks
- Secure Communication Protocols
- Payment Network Channels
- Cloud Infrastructure

8. Tokenization System: Tokenization is a data security process that replaces sensitive payment information—like credit card numbers or bank account details—with a unique, randomly generated code called a token. This token is used during transactions instead of the actual data, protecting users from data theft or fraud.

Mobile payment systems have revolutionized the way individuals and businesses conduct financial transactions by offering speed, convenience, and enhanced security. At the core of this transformation lies a sophisticated structure composed of eight interconnected components, each playing a vital role in ensuring smooth, secure, and efficient operations. The mobile device serves as the primary tool for initiating payments, empowered by advanced features such as NFC, biometric authentication, and secure storage. Supporting this is the mobile payment application, which acts as a

digital wallet, enabling users to store and manage their financial information with ease. Behind the scenes, the payment gateway functions as a critical bridge that securely transmits transaction data between users, merchants, and banks. For merchants, the interface or POS system is the point of interaction with the payment system, allowing businesses to accept payments in both physical and digital environments. These transactions are anchored by financial institutions, including issuing and acquiring banks, which verify, authorize, and settle payments across secure networks. Central to maintaining trust in mobile payments is the role of authentication mechanisms, which use biometrics, passwords, and other technologies to protect users from unauthorized access. These systems operate over a complex and robust network infrastructure, ensuring that data flows swiftly and securely between all participants. Lastly, tokenization systems add another layer of security by replacing sensitive information with non-valuable tokens, minimizing the risk of data theft during payment processing.²

Mobile payment systems are not just simple apps or devices—they are complex ecosystems built upon advanced technologies and interdependent components. Together, these elements provide a seamless, reliable, and secure payment experience that continues to evolve and shape the future of global commerce.

² Source: book about "Mobile Payment Systems: Structure, Security, and Technology"

1.3 Early forms of mobile payments.

The history of payments has featured numerous innovation milestones. When considering the future of this innovation and where mobile payments can potentially take the industry forward, it helps to look at the history first.

Long ago, only gold and other valuables were traded in transactions. Coins and notes took over this in time, and people learned to use the concept of money. Disruption followed in the form of cheques and wire transfers, allowing payments to be made faster and remotely. Bank cards and electronic payments were the next big game-changer, giving people new access to their bank accounts (and credit lines). Towards the end of the millennium, the birth of the internet swept through, and people were soon making regular transactions online. The story of mobile payments can be pinpointed as far back as the early 1980s and late 1990s. In 1983, electrical engineer Charles Walton received the first patent for a Radio Frequency Identification (RFID) device, the technology on which most mobile payments are largely based. During 1995, the first contactless payment was made in South Korea using a prepaid travel card called a UPass card, which was used by commuters for bus trips. Up until the early 2000s, cash payments were the only option available to most consumers across the world. While plastic payments were on the rise, only the affluent could afford credit cards. By the late 2000s, however, there was an increase in smartphone penetration globally. Simultaneously, mobile payment systems began to come to the fore. But we're getting ahead of ourselves. Let's take a closer look at how mobile payments began and what the future holds for them.

- **A Brief History of Mobile Payments**

Coca-Cola was the first company to introduce mobile-based payment for products or services back in 1997. An SMS could be used to pay for a Coke from a vending machine through an account linked to the user's mobile phone. Though this facility was available only for smaller amounts, or micropayments, as they're called, it opened up opportunities for further advancements in mobile payments technology. Around the same time, Merita Bank in Finland launched the first phone banking

service. Also SMS-based, this innovation had set the ball rolling for mobile payment systems in the banking space. That same year, the oil company, Mobil, also came out with a similar SMS-based payment service that was linked to the user's mobile device. After these pioneering efforts, the growth and adoption of mobile payments continued to increase year after year, while technologies evolved with time. By the end of the 19th century, consumers could enjoy the convenience of buying movie tickets using their mobile phones. Paving the way for further disruptions to the payments industry, 2007 became a watershed year, when Vodafone announced M-Pesa, its revolutionary mobile payment service that had transformed the way financial transactions were done in Africa, and enabled financial inclusion for those without access to traditional financial services. This payments solution had, thereafter, continued its success by entering global markets. Riding on SMS technology with PIN security, M-Pesa allowed its users to transact with money stored in an account on their mobile phones. 4 years later, tech giants, such as Google and Apple, entered the payments space, introducing innovations such as Google's NFC-based digital wallet solution and Apple's Passbook app. The latter being focused on storing and building passes that could be utilised as boarding passes, coupons, and gift certificates, among others.

Apple Pay - Apple's mobile payment and digital wallet service - was launched a while later, in 2014. The service, which could be used only in the USA with iPhone 6, soon became available in most countries across the world. Meanwhile, Android Pay and Samsung Pay were in the midst of being developed and were subsequently made available for use the following year - another watershed year for mobile payments technology.

- Achieving Sustainability with Mobile Payments

History has paved the way for new technological advances to improve business efficiencies and enhance the populace's quality of life. Despite the onset of the pandemic and global lockdowns, many businesses and consumers were able to weather the storm, as mobile transactions have become a main alternative payment option in lieu of cash. Here are some examples of trends in mobile payments that may help

businesses maintain sustainability well into the future, even in unfavourable market conditions:

1. **Mobile Contactless Payments:** Previously, credit and debit card users were required to slot or swipe their cards on a card terminal, but of late, consumers are able to tap and/or wave their cards in close proximity over the terminal instead. This is called contactless payments. A secure form of payment, contactless payments are not limited to plastic cards. Mobile phones or wearables with RFID (radio-frequency identification) or NFC (near-field communication) technologies can also be used to make contactless payments. Mobile contactless payments are constantly growing - At the end of the second quarter in 2018, there were over 400 million global mobile contactless payment users, and by the end of 2020, this number had been forecasted to reach over 750 million users. The growth potential for mobile contactless payments is limitless. With the number of smartphone users expected to reach 4.3 billion in just 2 years (a rise of almost 20% from 2020), its popularity stems from its safety, convenience, efficiency, and to many businesses, it helps them remain future-proof.

2. **e-Wallets:** Also known as digital wallets, e-wallets are usually in the form of a mobile phone app that is able to store pre-loaded money which can be topped up directly from a bank account or from one's credit or debit card. Any financial or personal information saved in an e-wallet is rendered secure as they are protected with advanced encryption. Even if one's phone gets stolen or is lost, security is still assured as all transactions need to be authenticated by the user (e.g., PIN or biometric authentication) before they are able to go through. In line with cashless agendas, some governments are providing merchants with incentives to adopt e-wallet payments. For merchants, adopting this form of alternative payment would open up new opportunities for revenue generation. According to the Boston Consulting Group, almost 50% of consumers based in urban areas of Southeast Asian countries and are commercial bank customers are using e-wallets, and this number is projected to increase to 84% by 2025.

3. **Direct Carrier Billing:** Sometimes referred to as operator billing, direct carrier billing or DCB is an online mode of payment that enables consumers to pay for their digital services or products via their mobile devices and are charged through their

monthly phone bill, or in real-time, if they are using a prepaid number. A great form of alternative payment especially in countries with large populations of unbanked and underbanked persons, the global DCB market is expected to reach US\$70 billion in revenue within the next 6 years, and at a CAGR of almost 12% between 2019 and 2027. Furthermore, with smartphone adoption being projected to penetrate 80% of the population, adopting DCB as a form of payment will provide businesses with an avenue to scale quickly, while tapping into a wide user base through various phone operators.

4. Mobile POS technology: A mobile point-of-sales (mPOS) system functions as a portable checkout system which is highly suitable for businesses on the go. mPOS may come in the form of a mobile POS terminal, a plug or dongle, or as a smartphone or tablet app, and enables the acceptance of contactless payments made using credit cards or contactless-payment enabled devices. Payment acceptance through an mPOS is secure as its system would comply with PCI (Payment Card Industry) security standards. Furthermore, as it would not require an extensive setup or expensive hardware, this would bring merchants' operating expenditures down.

5. Omnichannel payments: Consumers require convenience to simplify their everyday lives. This includes the way transactions are done. With a myriad of mobile payment options in the market, many consumers prefer patronising businesses that offer their choice of payments. Omnichannel payment acceptance allows merchants to provide their customers with different transaction methods through an integrated system, thus meeting different payment demands. Enabling varied in-app payments, mobile wallet solutions, and/or one-click commerce options at physical or virtual check-out counters can increase satisfaction, personalise experiences and retain customer loyalty. With transaction values via digital payments expected to grow at a CAGR of 12% from 2021 to 2025, we can expect to continue seeing new mobile payment innovations from bank and non-bank payment providers. Unlock your mobile payments advantage through VIA Open Platform's one-stop payment gateway solution, and go to market in Asia faster, with an agile and flexible integrated payments system. Since 2007, new tech users have grown up with smartphones and similar devices. Otherwise known as 'digital natives, they are more attuned to using this tech

in their daily lives. With devices in the palms of Gen Z, mobile payment solutions offer unprecedented access to these consumers. There was a time when financial services institutions struggled to engage with younger generations meaningfully. Smartphone tech has now solved this access issue, with mobile solutions seamlessly engaging them as customers of financial services institutions.

In 2011, Barclay's teamed up with Orange and launched Europe's first contactless mobile payment. The system enabled customers to pre-load their phones with up to £100 and make purchases that were up to £15 by using their phones. The same year, Google launched Google Wallet (now known as Google Pay™), allowing Android users to pay with their mobile phones at selected retailers in the US. Apple Pay was launched three years later in 2014 and then Samsung Pay came out in 2015. Elsewhere, contactless payments are continuing to gain momentum. Near-field communication and QR code-based transactions became particularly prevalent during the pandemic when contact had to be limited. However, this opened people's eyes to the ease and convenience of contactless mobile payments. This has exploded in popularity since then, with a record 93% of in-store card transactions using contactless payments in 2023. Interestingly, this isn't limited to younger generations, and 80% of consumers aged 85 to 95 reveal they now pay with contactless. Security has had to be heightened. If a person's device were stolen or misplaced, they would risk losing access to their payment accounts. Fortunately, tech innovations have paved the way for biometric authentication to enhance payment security. This has reduced the risk of fraud or crime and made consumers more at ease with using mobile payments for larger transactions. The tech is continually being enhanced to make biometric authentication even more secure and mobile payments increasingly convenient.

These figures are anticipated as the penetration of mobile technology continues to grow, even in 2024 and 17 years after the creation of the first iPhone. In the second quarter of this year, global smartphone ownership still grew by 6%. This demonstrates remarkable longevity and doesn't even factor in the parallel usage of other mobile devices, such as tablets and smartwatches. The use of mobile devices to facilitate payments is truly a significant innovation in the world of payments and commerce.

Vendors and banks have engaged with this technology and brought people a seamless user payment experience in the palm of their hands. This market is now vast, worth \$94.5bn in 2024 but now expected to expand rapidly with 34% compounded annual growth to reach \$408bn by 2029.

In one-word digital technologies plays crucial role in development of mobile payment system.

Chapter II. Adoption of mobile payments in foreign countries and Uzbekistan

2.1 Digital payment systems in Uzbekistan and their growth

Uzbekistan, as a country with a developing economy, is actively working to modernize its payment systems and strives to integrate into global financial networks. The history of the payment system of Uzbekistan began in 1991 when Uzbekistan became independent. The evolution of Uzbekistan's payment system includes the introduction of electronic payments (1995–2003), enhancements (2003–2010), notable adjustments (2015–2019), and the creation of a data processing center (2019–present) (CBRU, 2020). From 2015 to 2019, significant changes occurred in the development of the national payment system in Uzbekistan. The Decree of the President of the Republic of Uzbekistan dated September 19, 2018, marked the beginning of the development of the National Interbank Processing Center. This was an important step towards modernizing the payment infrastructure in the country. In 2019, preparations began for the construction of the Data Processing Center at the Central Bank of the Republic of Uzbekistan (CBRU), which would allow payments to be made 24/7. These efforts aimed to promote 24-hour activity, which is especially important for the country's business sector. In addition, a new installment system was developed, allowing businesses and individuals who are clients of commercial banks to make payments at any time. The system was deployed in the first quarter of 2020, and all commercial banks in the country were connected to it.

Beyond improving technological infrastructure, initiatives were also taken to improve the regulatory framework. On November 1, 2019, the Law of the Republic of Uzbekistan “On Payments and Payment Systems” was adopted (2024), which became the basis for regulation of the payment market by the CBRU, the functioning of payment systems, operators and payment service providers, as well as activities in the field of electronic money. The law is based on international experience and aims to ensure the proper operation of payment systems in the country (CBRU, 2020).

The fintech industry in Uzbekistan has witnessed remarkable growth and transformation in recent years. According to the CBRU, this is facilitated by favorable conditions for market participants. As of January 1, 2023, there were 47 licensed payment organizations in Uzbekistan (Boboev, 2023). The CBRU plays an important role in regulating and managing the country's payment systems. It has taken various measures aimed at increasing financial inclusion, enhancing security, and encouraging the use of digital payment alternatives. The CBRU has taken steps to reduce reliance on cash transactions, including incentives for businesses and consumers to use electronic payments and the creation of a national payment gateway to support secure online transactions. Boboev (2023) notes that in 2022, payment organizations carried out transactions worth 116 trillion UZS, which was 2.1 times more than in 2021. The most popular purpose of transactions in payment services was payment for mobile communications. The number of quick response (QR) codes installed in businesses increased by only 8 thousand and amounted to 99 thousand units. In 2022, the volume of transactions using near-field communication (NFC) technology increased 2.1 times compared to 2021 and reached 25.5 trillion UZS, particularly for in-store payments and transport services.³

Over the past decade, the banking industry in Uzbekistan has undergone significant growth with a noticeable step towards digitalization. However, the current digital banking infrastructure still has limitations that prevent it from functioning optimally. Many financial institutions depend on outdated core banking systems that are ill-suited to manage the volume and complexity of ongoing financial transactions. These legacy systems often lack the scalability and flexibility needed to accommodate new technologies that are vital for competing in today's fast-paced financial market. Additionally, the connectivity between multiple financial services and platforms is not seamless, resulting in inefficiencies and a less-than-satisfying user experience. While there have been initiatives to create online banking services, the overall level of adoption and functionality still has room for improvement, especially when compared

³ Source: Scholarship about "Enhancing the payment system in Uzbekistan"

to global norms. To improve digital transformation in Uzbekistan's financial industry, the following major obstacles must be addressed:

- Technical obsolescence: Many banks operate with outdated software and technology, affecting transaction processing, service delivery, and security.
- Cybersecurity vulnerabilities: Increased digital transactions have exposed banks to new cyber threats. Existing measures are often insufficient to counter sophisticated attacks.
- Regulatory compliance: The regulatory environment needs simplified rules to enable digital innovation while protecting privacy and data security.
- Skills gaps: A significant shortage of trained IT and cybersecurity professionals impacts the development and implementation of innovative solutions.
- Customer trust and acceptance: Building customer trust in digital banking products is vital. Concerns about digital security and unfamiliarity with new technologies lead to a preference for traditional methods (compiled based on, 2023),

According to 2021 data, “Fintechs usually implement their solutions around customer needs and leverage emerging technologies to produce a comprehensive and enhanced customer experience by gathering different services into one platform.” In Uzbekistan, the payment sector is less congested, with large banks holding the lion's share of the financial services market. Lack of competition stifles innovation and limits customer options. Introducing new companies, especially from the fintech industry, can promote competition and lead to improved services and solutions. Despite increasing interest in digital payments, cash continues to be the primary form of payment in Uzbekistan due to a lack of public trust and knowledge of digital solutions. Uzbekistan's cybersecurity landscape is reaching a crucial turning point. The danger of cyberattacks rises alongside the growing digital presence of the financial industry. Although many financial institutions have basic cybersecurity safeguards, these are often insufficient to fend off sophisticated and frequent cyberattacks.

The financial environment in Uzbekistan, like much of the world, is rapidly evolving, driven by technological breakthroughs, changing consumer expectations, and

a demand for faster and more secure transactions. Modernizing the payment system is not just about introducing new technologies; it is about having a stable framework that supports economic development, stimulates innovation, and increases accessibility.

As Uzbekistan continues to integrate into the international economy, modernizing its payment system becomes vital. The modernization of digital infrastructure in Uzbekistan, particularly in the banking sector, includes a dual approach: updating core financial systems and making large-scale investments in cybersecurity. The rapid pace of global technological change demands a strong infrastructure that can handle more digital transactions, provide better security, and improve user experience. Strengthening digital infrastructure within financial institutions is vital to achieving these goals. It will improve the efficiency and reliability of financial services, further integrate Uzbekistan into the global financial system, and build trust among customers and investors—an essential component in the digital age.

To properly adapt and grow digital payment systems in Uzbekistan, both short-term initiatives and long-term reforms are required. A comprehensive strategy encompassing technical modernization, legislative changes, and infrastructure development.

AI Integration into Uzbekistan's Payment Systems (2023–2030)

This timeline illustrates the incorporation of AI into Uzbekistan's payment systems from 2025 to 2030. The process begins in 2025 with research and strategic planning, including an evaluation of AI technologies. In 2026, development and testing commence with the creation of prototypes and integration testing. Implementation starts in 2027, featuring pilot programs and a nationwide rollout. The final phase, from 2028 to 2030, includes performance analysis, system improvements, and final optimization to ensure long-term success and flexibility.

According to the authors, AI will enable Uzbekistan's banks to offer more personalized services, thus improving customer experience and operational efficiency. AI applications in credit scoring and biometrics enhance risk assessment and

customization of financial services, which are essential for the development of the country's digital economy.

Reducing Cash Circulation and Transitioning to a Digital Economy in Uzbekistan

A successful transition to a digital economy in Uzbekistan requires strategic planning and coordination across all sectors.

- Strengthening public trust in banking institutions through greater transparency, improved service quality, and stronger protection of consumer rights. Educating the public on deposit guarantees and transaction security is vital.
- Developing infrastructure for digital payments, including expanding internet access, mobile networks, and payment terminals—especially in rural areas.
- Promoting the benefits of non-cash payments via education and marketing campaigns, emphasizing security, speed, and financial control.
- Legislative regulation to protect digital consumer rights and foster confidence in electronic payments.
- Pilot projects and business incentives, such as tax breaks, to test and encourage adoption of cashless technologies.

Uzbekistan faces significant challenges due to high cash turnover and low public trust in banks compared to European countries. Cash remains the dominant form of payment among the general population and small businesses. Therefore, a major shift in public attitudes is necessary, supported by transparent banking operations and widespread financial education.

Latvia's experience highlights the importance of technological readiness and financial literacy. Thus, training programs and awareness campaigns are crucial to building trust in digital financial transactions.

2.2 Mobile payment systems in foreign markets (Alipay, China)

The proliferation of mobile phones in the developing world is generating opportunities to provide payment services far beyond the banking system. Only 63% of people in developing countries have access to a bank account but 78% own a mobile phone. Increasingly, non-bank firms are taking advantage of the growth of mobile phones to provide payment systems, including mobile money (particularly M-Pesa in Kenya), Alipay and, more recently, central bank currencies. The World Bank wants to assist with the spread of new mobile payment systems among its client countries and to ensure that these payment systems are faster, cheaper and potentially safer than the cash-based payment systems typically used by low-income communities. The World Bank needs to be consistent with several policy goals, including financial inclusion, to extend payment systems to those without a bank account, known colloquially as the “unbanked.” Financial inclusion is an important interest of the World Bank, because low-income communities, particularly the unbanked, appear better able to move out of poverty when they can access formal financial services. Furthermore, financial inclusion is a policy goal for over 80 developing countries, making it important when considering policy trade-offs. In addition to financial inclusion, the World Bank is particularly concerned about the liquidity of payment providers and, as a consumer-protection issue, the protection of users’ funds in the event of bankruptcy of such firms.

The World Bank is also mindful of potential challenges that policymakers may face with implementing, monitoring, and supervising payment systems. In many developing countries, policymakers have resource constraints in relation to staffing, technology, and operating systems, impeding their ability to oversee existing payment and banking systems. Adopting new payment systems would put such constraints under additional pressure by requiring new regulatory and supervisory arrangements. Certain new mobile payment systems have grown very quickly and realization of loss of value or liquidity risk may contribute to various forms of systemic risk. The World Bank is interested in learning more about the operation of potential systemic risks that could arise through the collapse of such mobile payment systems. The World Bank is also

concerned that problems with insolvency regimes in many developing countries may mean that legal instruments used widely for new payment systems may have limited effectiveness. A key limitation with such regimes is their relative slow pace of operation. For example, the World Bank estimates that the average bankruptcy proceeding in sub-Saharan Africa takes three years. The remainder of this memo outlines the basic operation of several particularly prevalent non-bank payment systems that have been launched or have been intended for launch in the developing and emerging regions of the world. These include M-Pesa in Kenya, Alipay in China, a central bank currency in Ecuador, and Facebook-backed Libra.

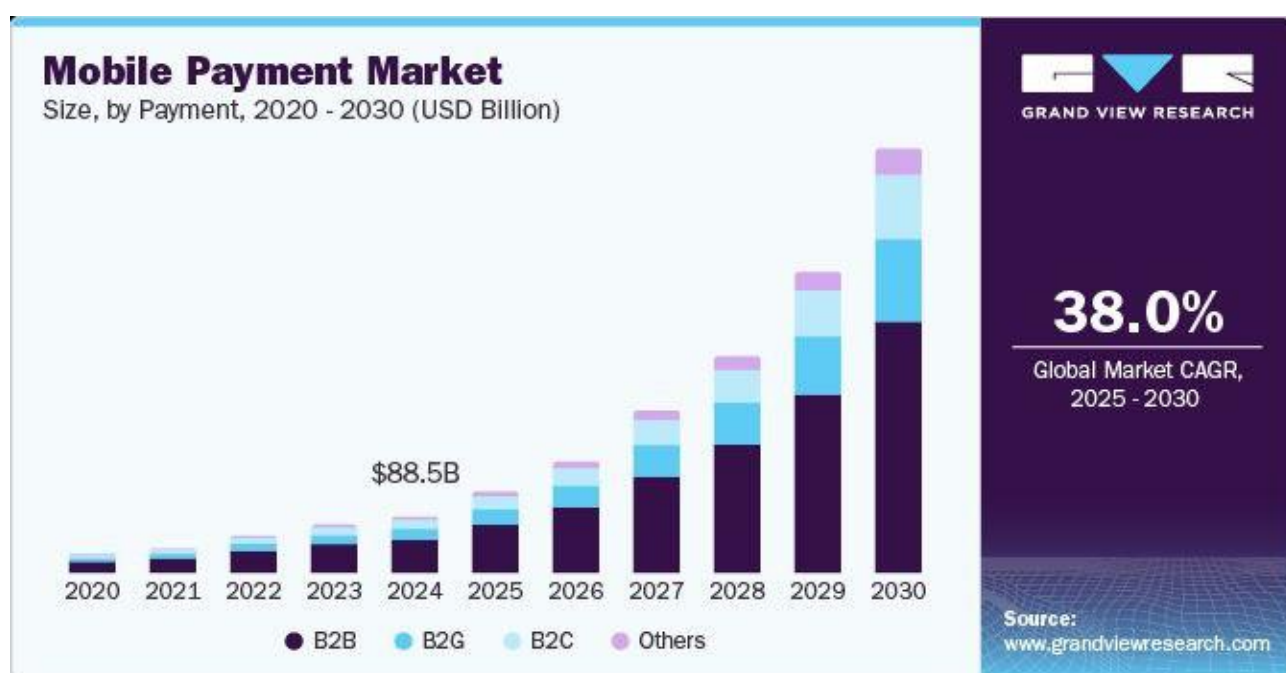


Image 2: Mobile Payment Market Size, Share & Growth Report, 2030
Alipay in China⁴

Ant Financial is an affiliate company of the Alibaba Group, focusing on fintech, and its primary product is the mobile-payment service Alipay. Like a bank deposit, Alipay operates as a mobile wallet with a number of in-app services which can be used to pay for a range of services, such as taxicabs, movie tickets, and utility bills. The app can also be used to transfer money to other Alipay users. Customers can deposit money in their Alipay wallets, which can then be used to purchase goods or services. Ant Financial also launched its own virtual credit card, Huabei, as an add-on service for

⁴ Source: www.grandviewresearch.com

Alipay users. Customers have two options when transferring their funds using the Alipay system. One is non-instantaneous in nature, i.e., transactions take place after confirmation of satisfactory receipt of service or goods. Until that point, the money is held in escrow. Alternatively, customers can elect for instantaneous payment where payments are quickly made, but funds are not stored in escrow. To use Alipay, a customer opens an Alipay account on a mobile phone, which comes with an attached mobile wallet, and then uploads funds into their mobile wallet. All money stored on the Alipay wallet account is stored on the Alipay system. In accordance with the most recent direction of the People's Bank of China, any customer funds which are not immediately transferred to their bank accounts or used for a purchase must be stored in a dedicated custodial account in a commercial bank. This is to protect customers' funds and to prevent any abuse or fraud.

Alipay was first launched in 2004 as a payment mechanism for Taobao, the world's largest e-commerce marketplace. In 2010, Alipay became a third-party payment system enabling it to provide services to additional actors beyond Taobao. This practice gave Alipay the ability to serve the growing number of Chinese who are connected to the internet mainly through mobile phones. Alipay has grown significantly in China due to a number of reasons. Through particular legal arrangements, the service developed customers' trust about its reliability and security. One key mechanism involved holding customers' funds in escrow until the required transaction is complete. This mechanism helped address problems of fraud in China's e-commerce system, which was riddled with transactions in which customers were sold defective goods. Alipay overcame this issue by holding the payment in escrow until the customer indicated satisfaction with the purchase, which built the credibility of Taobao and Alipay. Growing trust in online transactions, therefore, helped increase Taobao's and Alipay's business. Alipay also enjoyed a lack of competition from banks and credit card companies in China. Credit and debit card penetration in China has been historically low. Alipay facilitates payments without using cash, a credit card, or a debit card, which enabled China to leapfrog countries that relied on such instruments.

Alipay also benefited from the closed nature of China's internet system, which prevents ready access to local internet for non-Chinese companies. Stringent data-sharing norms, the lack of any privacy protections, censorship laws, and complex cybersecurity regulations serve as barriers to entry for non-Chinese firms. Certain foreign firms have sought to navigate these challenges to invest in China but later withdrew. For example, Amazon entered China in 2004, but closed its operations in 2019. Alipay does not work on 2G mobile phones; instead, customers must use a smartphone, which enabled the Alipay service to grow because of the rapid expansion of smartphone users. China now has over 713 million smartphone users.

Alipay also bundled together payment services with other financial services, particularly opportunities to access credit, to enable it to provide to customers a holistic set of financial instruments. Extension of formal credit has been comparatively low in China. In 2014, fewer than 10% of China's population had access to credit through a formal financial institution. Ant Financials' credit and insurance products, offered through Alipay, bridge this gap by providing these products to anyone who has a mobile phone. One product includes a low-cost health insurance product, dubbed "mutual protection," that covers the cost of treating 100 illnesses. The cost of the insurance is shared by all participants in the product with a cap of 188 yuan (\$26) per month. Customers can register for this product and make payments through the Alipay app. Ant Financial also offers an online cash management platform called Yu'e Bao, which is essentially a form of money market fund in which customers can invest through the Alipay platform. This platform is directed primarily at people who have spare money in their Alipay wallets and it has grown to become the largest money-market fund in the world with assets of \$233 billion.⁵

Compared to other developing countries, the People's Bank of China (PBOC), the Chinese central bank, has significantly greater institutional capability and the capacity to regulate new fintech products. The PBOC has taken a "wait-and-see" approach to Alipay and related products, enabling the bank to learn how they work and

⁵ Source: is compiles by author

develop regulatory frameworks. For example, Alipay launched in 2004 and the PBOC did not institute regulations until 2010. The PBOC developed additional regulations in 2019. These regulations are not publicly available. The sheer number of Alipay users and huge number of transactions raise complex questions around systemic risk. The service now involves one billion users worldwide with over 800 million citizens in China making 500 million transactions per day. Chinese policymakers may need to determine whether Alipay is systemically important and, if so, what regulatory tools to use should it fail. These decisions are challenging partly because China's non-bank payment system is bigger than any other country and may take a form of systemic risk not seen in other jurisdictions. Furthermore, most international standards contain a central assumption that banks, not non-banks, provide payment systems, and international standards reflect this assumption. For example, the Core Principles of Systemically Important Payment Systems issued by the Bank for International Settlements in 2001 (BIS Principles) assume that banks, not non-banks, provide the accounts through which payments are made. The BIS Principles then focus on systemic risk as taking the form of a contagion between banks and, through them, the stability of the system on financial markets. Other international standards make similar assumptions.

Policy questions are also informed by other policy objectives for Chinese regulators. Financial inclusion has been a stated objective and there has been recognition that Alipay's model has the potential to further this goal. The PBOC has revealed that it intends to utilize fintech platforms like Ant Financial to enhance the flow of credit and reduce finance costs for businesses. However, it remains unclear whether Ant Financial's products actually do help in extending financial inclusion, especially in rural areas, and what role the PBOC envisages such systems will play in reaching its goal of financial inclusion. While there is not much public information about the PBOC's thinking on this issue, given the size and potential of Ant Financial and its products, there cannot be any doubt about the apparent importance of Ant Financial to the PBOC's financial-inclusion goals. Ant Financial's products, especially Alipay, are being increasingly accepted outside China. Alipay is now available in 54

international markets, most of which are in the West and in Southeast Asia. Ant Financial's success in reaching these markets is driven primarily by the need to cater to Chinese tourists who are now the biggest global spenders. Acceptance of Alipay's payment mechanism allows local businesses in these countries to readily attract Chinese tourists.

Another factor for the growth of Alipay's platforms, especially within countries in The Association of Southeast Asian Nations (ASEAN), is the presence of large Chinese diasporas cropping up in the countries of this region and more individuals using Ant Financial's products to transact with their families back in mainland China. Ant Financial has also been exporting its model to other countries, primarily through investments in similar financial products like PayTM in India. It is unclear whether Ant Financial will be able to grow in other countries at a similar rate as in China. Ant Financial will not enjoy the restrictions on investment that make it costly for non-Chinese companies, particularly technology firms such as Amazon and Google, to succeed in the Chinese market.

2.3 Formation of mobile payment infrastructure in Uzbekistan (PayMe)

One of the major developments in the financial sector in the 21st century is the rapid growth and implementation of mobile payment systems. As part of the global shift toward a digital economy, financial services in Uzbekistan are undergoing a significant transformation, becoming faster, more secure, and more accessible to the general public. Mobile payment systems—powered by fintech solutions—have become essential tools in facilitating cashless transactions and expanding financial inclusion. In Uzbekistan, the government has prioritized the digitalization of the financial sector, with special attention given to the development of mobile payment infrastructure. Over the past few years, the number of mobile wallet users has grown significantly, driven by increasing smartphone penetration, better internet access, and the active participation of fintech startups and commercial banks.

Notable mobile payment platforms such as Payme, Click, Apelsin, and Oson have transformed how citizens pay for goods and services, transfer money, and interact with financial institutions. These platforms offer user-friendly mobile apps that support QR-code payments, utility bill settlements, online shopping, and even microloans. Their integration with government services and retail systems has improved transparency and operational efficiency across sectors. This article analyzes the evolution of mobile payment systems in Uzbekistan, using data from 2018 to 2024, as well as reports from the Central Bank, fintech companies, and user feedback. The study explores how mobile payments have influenced consumer behavior, banking operations, and the broader economic landscape, while also identifying the challenges that remain in achieving full digital financial inclusion.

About payme

Payme is one of the leading online payment systems in Uzbekistan, widely used for making various financial transactions through its mobile app. Established in 2012, the platform has grown rapidly and now serves millions of users across the country.

The Competition Committee recognized Payme as an operator with a dominant position in the online payment systems market, based on a notification submitted by

the company. Payme was recognized as a dominant player in the online payment systems market. The Committee for the Development of Competition and Consumer Protection recognized Payme Joint Stock Company as an operator with a dominant position in the online payment systems market. The notification submitted by Payme to the Competition Committee on the achievement of a dominant position in the online payment systems market was taken as the basis for this.

The Regulation "On the Procedure for Recognizing the Dominant Position and Superior Negotiating Power of a Digital Platform Operator," approved by the Cabinet of Ministers' Resolution of May 1, 2024, establishes the criteria for recognizing a digital platform operator as having a dominant position. In accordance with this decision, by the relevant order of the committee, Payme JSC was recognized as a digital platform operator with a dominant position in the online payment systems market. The payment service is part of the Georgian banking group TBC Bank Group. For the first nine months of last year, Payme's revenue amounted to 341.6 billion soums (+38.1 percent compared to the same period in 2023), and net profit reached 186.94 billion soums (+22 percent). For information, a dominant position is a situation in a commodity or financial market that allows an economic entity or group of individuals to carry out its activities independently of competing economic entities and to exert a decisive influence on the state of competition, to make it difficult for other economic entities to enter the relevant market, or to otherwise restrict their freedom of economic activity.

A dominant position in a product or financial market is recognized if a company or group of individuals has a market share of 40 percent or more, as well as in other cases. In late October, the Competition Committee recognized YandexGo, Yandex Eats, and Express24 as digital platform operators with a dominant position (monopoly). In December, Uzbekistan Airways and Silk Avia were recognized as having a dominant position. The two companies occupy more than 40 percent of the domestic air transportation market, and Uzbekistan Airways, in addition, has a market share of more than 40 percent in passenger, cargo, and mail transportation on international routes.

Organizational Structure: Payme operates as a subsidiary of TBC Bank Group, specializing in payment services. On May 23, 2023, TBC Bank Group acquired the remaining 49% stake in Payme for \$55.7 million, gaining full ownership of the company.

Achievements and Recognition

- In 2022, Payme was recognized as "The Best Digital Payment Service Provider in Uzbekistan."
- In January 2025, the Payme Plus subscription service was launched, offering additional financial and lifestyle services to users.
- In January 2025, the Committee for the Development of Competition and Consumer Protection recognized Payme as a dominant operator in the online payment systems market in Uzbekistan.

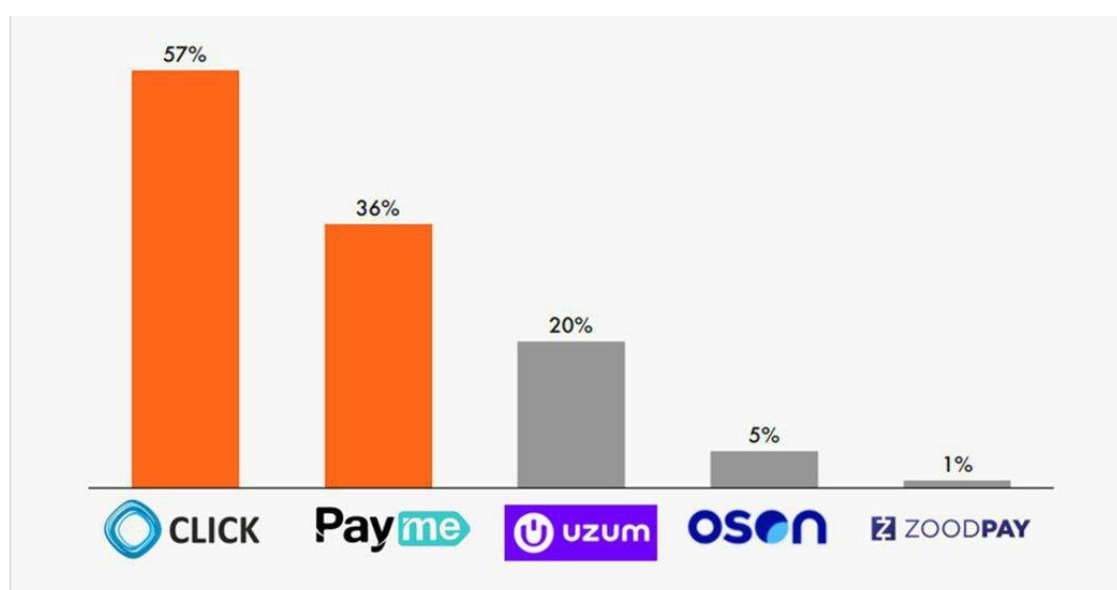


Image 3: Share of merchants accepting payments using different types of digital wallets (2024)⁶

The formation of mobile payment infrastructure in Uzbekistan, particularly through the rise of platforms like Payme, marks a significant transformation in the country's financial landscape. As one of the pioneering and most widely adopted digital

⁶ Source: Open data from digital payment providers in Uzbekistan- www.data.egov.uz

wallets, Payme has played a crucial role in modernizing payment practices among individuals and businesses alike. By offering fast, secure, and user-friendly services, Payme has contributed to the widespread acceptance of cashless transactions, especially in urban areas.

The development of mobile payment systems has also encouraged competition and innovation in the fintech sector, fostering the emergence of other platforms such as Click, Paynet, and Apelsin. Government recognition and regulatory support—such as the 2025 acknowledgment of Payme as a dominant operator—further underline the system's growing importance in the national economy.

Despite challenges such as digital literacy gaps and infrastructure limitations in rural areas, Uzbekistan continues to make strides toward a more inclusive and efficient digital financial ecosystem. Overall, the success of Payme exemplifies how well-structured mobile payment infrastructure can drive economic digitalization, promote financial inclusion, and enhance convenience for consumers and businesses alike.

CONCLUSION

Mobile payments have become a crucial component in modern economic activities, fundamentally transforming the way individuals and businesses conduct transactions. Their organization involves a network of digital platforms, financial institutions, and regulatory frameworks that ensure secure, fast, and convenient money transfers. Mobile payments contribute to economic growth by increasing financial inclusion, improving transaction efficiency, and supporting the development of e-commerce and digital entrepreneurship. As technology continues to evolve, the role of mobile payments is expected to expand further, fostering innovation and greater integration of digital financial services into everyday economic life. Therefore, the effective organization and regulation of mobile payment systems remain essential for maximizing their positive impact on the economy.

1. Mobile payments are characterized by their speed, convenience, and accessibility, allowing users to perform financial transactions via smartphones and other digital devices without the need for physical cash or cards. These features make mobile payments especially valuable in today's fast-paced, digital-oriented world. Their importance lies in enhancing financial inclusion, supporting cashless economies, and fostering innovation in both retail and service sectors. By streamlining payment processes and reducing transaction costs, mobile payments significantly contribute to economic efficiency and consumer satisfaction.

2. Mobile payment systems consist of several interconnected components, including mobile devices, payment applications, financial institutions, telecommunication networks, and security protocols. Each component plays a vital role in ensuring smooth, secure, and efficient transactions. The integration of these elements enables real-time processing, user authentication, and data protection, which are essential for building trust and reliability in mobile payments. A well-structured system enhances usability and scalability, allowing for widespread adoption across different sectors of the economy.

3. The evolution of mobile payments marks a major milestone in the history of financial innovation. From early SMS-based transactions to today's advanced contactless and biometric-secured payment methods, mobile payments have revolutionized the way people interact with money. Their growth has been fueled by smartphone adoption, increasing digital literacy, and demand for convenience and security. Key innovations like e-wallets, direct carrier billing, mPOS systems, and omnichannel solutions have enhanced business sustainability and financial inclusion. As mobile technology continues to expand, mobile payments are set to play an even more central role in the global economy, driving a future that is faster, safer, and more connected.

4. The development of Uzbekistan's payment system reflects a steady transition toward digitalization, marked by key reforms such as the establishment of a National Interbank Processing Center and the implementation of 24/7 payment capabilities. Legal initiatives, including the 2019 Law "On Payments and Payment Systems," have provided a regulatory foundation for the growth of electronic and fintech services. Despite progress, the financial sector still faces challenges such as outdated core banking systems, cybersecurity vulnerabilities, limited public trust, and a shortage of qualified IT professionals. To ensure a successful shift to a digital economy, Uzbekistan must focus on modernizing financial infrastructure, improving digital literacy, strengthening data protection, and building consumer confidence in digital services. With coordinated efforts and strategic investments, the country can fully integrate into global financial networks and support inclusive economic growth.

5. Mobile payment systems are reshaping financial access in developing countries by offering fast, low-cost, and inclusive alternatives to traditional banking. Services like M-Pesa in Kenya and central bank digital currencies are helping bridge the gap for the unbanked population, expanding formal financial services and reducing poverty. However, these innovations also raise concerns about consumer protection, liquidity risks, and the regulatory capacity of policymakers in low-resource environments.

Alipay, as a leading example from China, illustrates how mobile payment platforms can rapidly scale by integrating payment functions with credit, insurance, and investment services. Its success is rooted in legal safeguards like escrow services, minimal competition from banks, and favorable market conditions such as high smartphone adoption and government support. While Alipay has expanded into over 50 foreign markets, its growth model may not be easily replicable elsewhere due to China's unique digital ecosystem and regulatory landscape. Still, Alipay stands as a powerful case study for the potential of mobile fintech to drive financial inclusion and reshape global payment systems.

6. Mobile payment systems in Uzbekistan are growing rapidly, helping expand financial access and reduce reliance on cash transactions. As smartphone use increases, digital payments are becoming more convenient and trusted by the population. Payme is one of the leading mobile payment providers in Uzbekistan, offering fast, user-friendly services for utility payments, transfers, and online shopping. Its growth reflects the country's digital transformation and the rising demand for smart financial solutions.

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