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**QR-Based Payment Systems in Bangladesh: A Comprehensive
Overview of Developments and Adoption Barriers**

**Md Rashel Hasan
Md Khorshed Alam
Mst. Nurnaher Begum**



**Chief Economist's Unit
Bangladesh Bank**

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Md Rashel Hasan¹
Md Khorshed Alam
Mst. Nurnaher Begum

Abstract

This paper provides a comprehensive review of Bangladesh's QR-based payment landscape, with particular emphasis on the development, readiness, and adoption of the interoperable QR system. The findings show that nearly half of the eligible payment institutions have yet to operationalize interoperable QR-based payments. Despite having over 210 million active MFS accounts and 121 million mobile internet subscribers at the end of FY25, cash still dominates the retail ecosystem, accounting for 35 percent of formal retail payments—substantially higher than regional peers such as India (4 percent) and Pakistan (10 percent). Key barriers identified include low merchant adoption of standardized Bangla QR codes, persistent cash usage in supply chains, trust issues, limited user awareness, a uniform Merchant Discount Rate (MDR) that disproportionately affects micro and small merchants, uneven technological readiness, and the absence of an application-based unified instant payment interface. The study also examines successful international cases—such as India's UPI, Brazil's Pix, Singapore's FAST, and Malaysia's DuitNow—to draw lessons applicable to Bangladesh. Based on these insights, the paper recommends subsidizing transaction costs for low-value payments, introducing a tiered MDR structure, implementing targeted awareness programs, enhancing digital infrastructure, developing an application programming interface (API) based unified instant payment system, and establishing a dedicated Instant Retail Payment and Settlement Corporation to strengthen governance and accelerate nationwide QR-based payment adoption. Collectively, these measures are expected to facilitate the development of a more efficient, interoperable, and inclusive QR-based payment ecosystem in Bangladesh.

Keywords: Quick response (QR) Code payment system, Measuring cash use in Retail payments, Bangla QR Code-based payment system.

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Section I: Introduction

The financial sector has undergone a profound transformation over the past few decades, mainly driven by rapid technological advancements. The most notable developments are the transition from traditional cash-based transactions to cashless or electronic payment systems (Di Iorio et al., 2025). These innovations have enhanced the efficiency of the payment system, reduced reliance on physical currency, and reshaped how individuals, businesses, and governments conduct financial transactions. For both developed and developing economies, the shift toward electronic payments represents a critical step in building more inclusive, transparent, and resilient financial ecosystems.

A cashless transaction refers to an economic setting where goods and services are exchanged without physical cash, typically through electronic transfers. The global volume of cashless payments has been expanding rapidly, particularly in emerging market and developing economies (EMDEs). According to the Committee on Payments and Market Infrastructures (CPMI), a recent brief by Di Iorio et al. (2025) published by the Bank for International Settlements (BIS) reports that in 2023, annual cashless payments per capita in emerging market and developing economies (EMDEs) grew by 29 percent (from 293 to 377 transactions), compared with only 4 percent growth (from 468 to 487 transactions) in advanced economies (AEs). The report also added that the rise in EMDEs has been primarily driven by the rapid adoption of fast payments, such as Quick Response (QR) code-based payment system. According to the report, in 2023, the share of fast payments in total cashless transactions ranged from 7 percent in Australia to 63 percent in Argentina and as high as 82 percent in India.

Recognizing these global shifts, central banks worldwide have emphasized the importance of establishing robust electronic payment infrastructure. Such systems offer cost-effectiveness and efficiency while reducing the burdens associated with managing physical cash. Printing, securing, and distributing cash is expensive, and economies remain exposed to risks such as theft, fraud, and other cash-related crimes. Beyond cost savings, cashless payments can also stimulate economic growth. For instance, Aguilar et al. (2024) found that a one percentage point increase in the use of digital payments is associated with a 0.10 percentage point (or 0.05 percentage point annually) rise in per capita GDP growth over two years.

Despite these benefits, cash continues to dominate retail payments²—small-value transactions made by households or individuals for daily necessities and services. This heavy reliance on cash poses a significant barrier to an efficient electronic payment system. Facilitating retail payments through electronic channels could substantially reduce reliance on cash, lower central bank expenditures, and enhance the overall financial ecosystem. For example, in FY24, the cost of printing banknotes in Bangladesh alone totaled BDT 3.4 billion (annual average of BDT 3.2 billion over the last 10 years), excluding additional expenses and risks associated with handling cash (Bangladesh Bank, 2023). Evidence further suggests that initiatives to integrate and harmonize the retail payment markets foster trade, enhance consumption, and contribute positively to the overall economy (Hasan et al., 2013).

In line with global developments, Bangladesh Bank (BB) and the Government of Bangladesh have introduced several initiatives to promote electronic payments and reduce reliance on cash. Notable examples include the Bangladesh Automated Cheque Processing System (BACPS), Bangladesh Electronic Funds Transfer Network (BFTN), Real-Time Gross Settlement (RTGS), National Payment Switch Bangladesh (NPSB), QR-based payments, the Bangladesh Automated Clearing House (BACH), Internet Banking Fund Transfer (IBFT), Interoperable Digital Transaction Platform (IDTP) and, most recently, the Bangla QR system (used widely in universities, hospitals, and digital cattle markets). Along with strong policies and support for banks, the initiatives of Mobile Financial Services (MFS), Payment Service Providers (PSPs), and Payment System Operators (PSOs) are designed to accelerate, lower costs, and make the payment ecosystem more user-friendly.

Since 2010, the BB has actively worked to strengthen the country's payment infrastructure. The expansion of internet connectivity and the availability of affordable smartphones have also been critical prerequisites for advancing toward a cashless society. Nevertheless, when compared with global trends, Bangladesh still lags, particularly in reducing its dependence on cash for small-value retail transactions.

Among the various initiatives to transition from a cash-based economy to a cashless or digital payment ecosystem, QR-based payments stand out as a significant advancement (Di Iorio et al.,

² Retail payments refer to everyday, low-value financial transactions made by individuals to pay for goods, services, or personal obligations. Examples include buying groceries or clothes (in-store or online), paying utility bills or school fees, sending money to family or friends, and paying for transportation, restaurants, or small services.

2025). By offering a convenient, low-cost, and secure mode of transaction for both consumers and merchants, QR-based payment systems have shown strong potential to enhance financial inclusion and accelerate the adoption of digital financial services. Countries such as Brazil, China, India, Paraguay, Malaysia, and Singapore have achieved remarkable success in reducing their dependence on cash and advancing toward digital economies primarily through the widespread adoption of QR-based payment systems.

In response to this global trend, MFS providers in Bangladesh introduced their own proprietary QR-based payment systems in 2018. However, these early models were merchant-specific, meaning each QR code could only be used for payments within the issuing provider's network. To address this limitation, BB launched Bangla QR as an interoperable payment platform in 2021, introducing an interoperable QR code payment standard that enables seamless transactions across different banks, MFS providers, and PSPs (Bangladesh Bank, 2021). This initiative has significantly expanded the acceptance and accessibility of digital payments among both merchants and consumers. Despite these advancements, however, cash continues to dominate day-to-day economic transactions, underscoring the need for stronger adoption measures, greater merchant participation, and more comprehensive policy support to accelerate the transition toward a truly cashless society.

Against this backdrop, the paper's primary objective is to present a comprehensive overview of Bangladesh's payment landscape, with particular emphasis on the adoption of an interoperable QR-based platform from both issuer and user perspectives. In doing so, the study also examines the persistent dominance of cash in retail transactions and situates Bangladesh's experience within broader global trends. Following the introduction in Section I, Section II synthesizes the relevant literature. Section III outlines the analytical approach used to measure cash use in formal retail payments. Section IV describes the major retail payment instruments currently available in Bangladesh, while Section V examines the evolution, readiness, and performance of QR codes and QR-based payment systems. Section VI draws lessons from peer countries that have successfully expanded QR-based and instant payment ecosystems. Section VII identifies key challenges and presents policy recommendations to accelerate adoption. Finally, Section VIII concludes the paper by highlighting its implications for policymakers and the future of digital payments in Bangladesh.

Section II: Review of Literature

The growing global shift toward cashless transactions has prompted researchers to examine how digital payment innovations influence broader economic and financial outcomes. Aguilar et al., (2024) provides one of the most comprehensive cross-country perspectives on this. Studying 101 economies between 2014 and 2019, the authors find that greater use of digital payments is associated with measurable improvements in per capita GDP growth and reductions in informal sector employment. Their findings underscore an important policy insight: digital payment ecosystems do not merely reduce cash dependency—they also contribute to formalization and economic expansion.

While digital payments at a macro level are linked to economic development, several studies have explored how QR code-based payment systems, in particular, enable this transition. In the Indian context, Mishra et al. (2024) show that QR codes have played a central role in accelerating the adoption of digital payments among small merchants and consumers. Their survey of 400 respondents in Eastern Uttar Pradesh reveals that convenience, ease of use, and cost-effectiveness make QR-based systems especially attractive to low-income and small-scale user groups that often face barriers in adopting more sophisticated digital payment tools. This evidence highlights the role of QR payments as a low-cost enabler of financial inclusion.

Hasan et al. (2013) find that efficient cashless payment systems significantly stimulate economic activity, enhance consumption, and increase trade across 27 European markets. Their findings reinforce the long-standing economic argument that digital payments improve efficiency, reduce transaction costs, and expand market participation.

Moreover, a significant body of research also focuses on behavioral determinants of QR code payment adoption. Türker et al. (2022) using data from 485 Turkish users, highlight that perceived trust is the strongest predictor of intention to use QR code mobile payment systems. Perceived usefulness and perceived compatibility also play important roles.

Similarly, Tu et al. (2022) explore how external social influences and internal perceptions of health and safety—particularly during the COVID-19 pandemic—shape behavioral intentions to use QR payments. Using data from 248 respondents, they show that perceived severity and social influence increase perceived benefits, which, in turn, raise the intention to adopt QR-based payment methods.

Beyond consumer adoption, QR-based payment systems have also demonstrated strong potential to improve business performance. Wardhani et al. (2023) show that adoption of Indonesia's QRIS significantly enhances the financial performance of MSMEs by increasing transaction counts, sales turnover, and overall business cash flow. These findings illustrate how QR systems can strengthen business viability, particularly for micro- and small-enterprises.

Islam et al. (2024) explore the factors influencing users' behavioral intentions, attitudes, and actual adoption of quick response (QR) mobile payment in Bangladesh. By using purposive sampling, data were collected from 412 respondents. The study indicates that performance expectancy, effort expectancy, and social influence significantly positively influence users' behavioral intention, while self-concept, perceived self-efficacy, and habit substantially influence their attitudes towards using QR mobile payments. The findings also confirm a positive effect of users' attitudes toward QR mobile payments on both behavioral intention and actual use, as well as a positive effect of behavioral intention on actual use.

The existing literature provides valuable insights into QR-based payment adoption, covering merchant and consumer behavior, MSME financial performance, intention to use mobile payment systems, and psychological or external factors influencing digital payment decisions. However, these studies largely reflect experiences from other countries and contexts. Evidence specifically focused on Bangladesh remains limited, particularly regarding interoperable QR systems such as Bangla QR. Key questions remain unanswered about how merchants perceive the system, what motivates or discourages customer adoption, and how regulatory and infrastructural readiness translates into actual usage.

To address this gap, the present study aims to explore the barriers, growth patterns, and challenges of QR-based payment systems in Bangladesh, offering contextual insights that have been underrepresented in existing research.

Section III: Measuring Cash Use in Payments

Use of Cash as a Payment Option

Cash is demanded for various reasons, including as a precautionary measure, to facilitate illegal activities, and as a medium of payment (Khiaonarong & Humphrey, 2022). In recent years, the proliferation of payment options—such as mobile payments, payment cards, and E-Money—has given consumers greater flexibility in choosing whether to use cash or alternative payment

methods. However, studies show that cash remains the dominant payment method for small-value transactions, despite the increasing availability of digital alternatives (Huynh et al., 2014; Klee, Elizabeth, 2008). Although the COVID-19 pandemic accelerated the adoption of card and mobile payments in many countries, several studies find that cash remained widely used in populous and developing economies due to factors such as large informal sectors, limited digital access, and trust issues with electronic systems (Francisco, 2016; Glowka et al., 2023; Kotkowski & Manikowski, 2023; Wisniewski et al., 2024).

Both demand-side and supply-side factors are associated with the continued use of cash as a medium of payment. On the supply side, many merchants are reluctant to accept digital payments due to interchange fees and the associated costs of maintaining electronic payment infrastructure. From the demand-side perspective, consumer preferences also play a critical role. Wakamori & Welte (2017), for instance, found that consumers' preference for cash—particularly in small-value transactions—was driven by considerations of convenience, anonymity, and transaction speed. Islam et al. (2024) similarly find that key Unified Theory of Acceptance and Use of Technology (UTAUT) factors—such as performance expectancy, effort expectancy, and social influence—shape users' behavioral intention to adopt QR payments, while attitudes and behavioral intention strongly predict actual use. Despite these factors, most economies have observed a gradual decline in overall cash use in recent years.

Measuring Cash Use Global Context

Measuring the extent to which cash is used for retail payment purposes, however, is not straightforward. Several proxies have been developed to approximate cash usage in the economy. A simple metric, such as the currency in circulation (CIC) to GDP ratio, provides only a partial picture. While a rising CIC-to-GDP ratio reflects broader monetary activity, most of these payments involve instruments that do not directly compete with cash, thereby failing to accurately capture cash's role as a means of payment.

A more precise approach is the market share method, which measures cash relative to its substitutes. Khiaonarong & Humphrey (2022) suggest using the following indicator:

$$\text{Cash Share} = \frac{\text{CASH}}{\text{CASH} + \text{CARDS} + \text{E Money}}$$

Where *CASH* denotes the total value of ATM cash withdrawals, and *CARDS* represents debit and credit card payments. E-money is defined as a stored-value arrangement in which funds are

stored on a card or mobile phone (akin to an electronic wallet). This ratio indicates the extent to which cash remains a primary payment instrument in an economy.

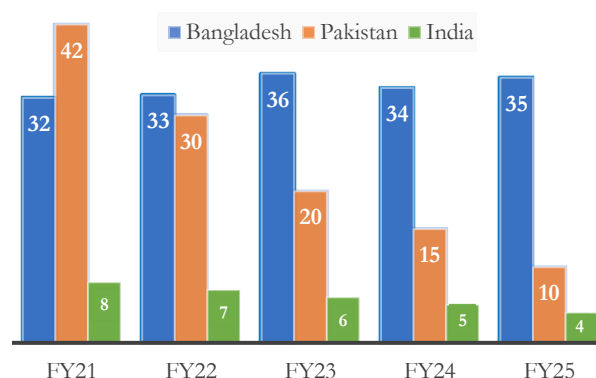
Measuring Cash Use in Bangladesh

To estimate the extent of cash reliance in Bangladesh's retail payment system, we use an equation conceptually similar to that proposed by Khiaonarong and Humphrey (2022), but adapted to reflect Bangladesh's financial market structure and data availability. The indicator for the Share of Cash Use in Retail Payments is defined as follows:

$$\text{Share of Cash Use} = \frac{\text{CASH based Payments}}{\text{CASH based Payments} + \text{Cashless Payments}}$$

Where Cash-based payments indicate ATM Withdrawals (including CRM) and Cash-out Using MFS. Cashless payments represent E-commerce Payments (Cards), POS Payments, Merchant Payments through MFS, Other Payments through MFS, and Electronic Fund Transfer (EFT). Using the above equation³, we estimated the share of cash use relative to its alternative payment substitutes within Bangladesh's formal payment infrastructure. In FY20, during the COVID-19 pandemic, the share of cash usage stood at 37 percent. It declined to 32 percent in FY21 and remained around 33 percent in FY22, reflecting a behavioral shift toward contactless payments as people sought to avoid physical cash handling to reduce the risk

Chart 1: Share of cash usage in retail payments (in percent)



Source: Authors' calculation based on data of corresponding central banks.

³ Due to the unavailability of consistent time series data, several components were excluded from the estimation. These include Over-the-Counter (OTC) cash withdrawals, which can be considered cash-based payments, and Intra/Inter-bank fund transfers conducted through internet banking (excluding Bangladesh Bank platforms), as well as IBFT, which represent cashless transactions. Payments processed through the RTGS system were also omitted, as RTGS primarily handles large-value interbank transactions rather than retail payments. Moreover, transactions through the BACPS—classified as non-digital (Bangladesh Payment Systems Report, 2024)—were excluded because of insufficient data to determine the portion converted into retail cash withdrawals. The remaining components used in this analysis are therefore hypothesized to represent retail payments or their closest equivalents.

of infection. However, the share rose again to 36 percent in FY23 and has stabilized at approximately 35 percent in FY25 (Chart 1).

When compared with neighboring countries such as India⁴ and Pakistan⁵, Bangladesh's reliance on cash remains significantly higher. In 2016, India demonetized approximately 86 percent of its circulating currency and simultaneously launched major cashless initiatives while investing heavily in digital payment infrastructure. These combined efforts led to remarkable progress in digital payment adoption, which further accelerated during and after the COVID-19 pandemic. The share of cash in total retail payments in India dropped from 8 percent in 2021 to just 4 percent in 2025. Similarly, Pakistan has demonstrated substantial improvement in reducing cash dependence, with the cash share in retail payments declining from 42 percent in 2021 to 10 percent in 2025. These trends suggest that while Bangladesh has made progress toward digitalization, its transition to a cashless economy is slower than that of its regional peers (Chart 1).

Section III: Retail Payment Methods in Bangladesh

In Bangladesh, individuals have access to several options for making retail payments. Among these, cash remains a prominent means of payment, with its availability stemming from multiple sources. Typically, individuals obtain cash through (Automated Teller Machine) ATM or Cash Recycling Machine (CRM) withdrawals, cash-out transactions using MFS, or directly from the counters of banks and agent banking outlets. At the same time, cashless payment platforms are expanding rapidly, reflecting Bangladesh's evolving financial landscape, where traditional cash-based transactions coexist with modern digital payment systems.

ATM Withdrawals (including CRM)

People generally withdraw money from ATMs to obtain cash for small, everyday purchases—such as in local markets, for transport fares, with street vendors, or in small shops—to meet personal financial obligations (such as house rent). In Bangladesh, ATM withdrawals remain the dominant

⁴ For the case of India, their monthly payment system indicator reports both transaction volume and the value of total retail payments in the system. Moreover, they also report ATM cash withdrawals separately. We estimate the share of cash used in India = ATM cash withdrawal / Value of total retail transactions. The Data we got from different issues of [Payment System Indicators, published by the Reserve Bank of India](#).

⁵ Similarly, for Pakistan, the annual payment system review reported both transaction volume and the value of total retail payments. We calculated the Share of Cash Uses in Pakistan = ATM cash withdrawal / Value of total retail transactions excluding bank branches. Data collected from [Annual Payment Systems Review – FY24](#) and [Review for the 3rd Quarter of Fiscal Year 2024-25](#), published by the State Bank of Pakistan.

method for obtaining cash for retail transactions, thereby reinforcing a nationwide cash-based payment culture.

Cash-out Using MFS

Similar to ATMs, people use cash-out services through Mobile Financial Services (MFS) to obtain cash for small, everyday purchases. In rural regions of Bangladesh, this is the primary way to access cash for retail payments. Consequently, cash-out through MFS continues to promote a cash-dependent payment environment, especially in rural areas.

E-commerce Payments (Cards)

E-commerce, short for electronic commerce, refers to the buying and selling of goods and services over the internet, where transactions are conducted digitally rather than face-to-face. Card-based payments for e-commerce transactions are increasingly promoting cashless retail transactions in Bangladesh. Moreover, e-commerce payments can also be made through internet banking platforms, where available, and via MFS, offering consumers multiple convenient and secure digital payment options.

POS Payments

Point of Sale (POS) payments are electronic transactions made at POS machines, in which customers purchase goods and services with debit or credit cards instead of cash. This system serves as an essential cashless transaction platform across retail outlets, restaurants, and service centers.

Electronic Fund Transfer (EFT)

Electronic Fund Transfer (EFT) is a digital payment system that allows individuals, businesses, and government agencies to transfer funds between bank accounts quickly and securely through the Bangladesh Electronic Funds Transfer Network (BEFTN). It is one of the key cashless retail payment methods, regulated and operated by the BB, which supports the country's move toward a more efficient and transparent cashless retail payment ecosystem.

Merchant Payments through MFS

Merchant payments through MFS refer to digital payments made by customers to merchants for purchasing goods and services using mobile financial services accounts, such as bKash, Nagad, or Rocket, rather than cash. MFS has become one of the fastest-growing forms of cashless retail transactions in Bangladesh. In addition to MFS platforms, many merchants offer multiple payment

options, including bank cards and QR-based payments. While QR-based payments are primarily facilitated through MFS providers, an increasing number of banks are also adopting QR payment systems at merchant outlets, expanding the country's digital payment ecosystem.

Other Payments through MFS

Other payments through MFS include person-to-person transfers, government-to-person payments, employee salary disbursements, payments for mobile talk time and internet purchases, and utility bill payments. These are also considered cashless payment methods in Bangladesh.

There are several other payment methods, including over-the-counter withdrawals, manual or BACH cheque payments, intra- and inter-bank fund transfers, IBFT, and RTGS. However, time series data for most of these modes are not available.

Section V: QR code and QR code-based payment

A QR code, or Quick Response code, is a two-dimensional barcode that can store a wide range of information, including website links, product details, and payment instructions. It consists of black squares arranged on a white background, which a smartphone camera or a QR code reader can easily scan. Unlike traditional barcodes, which hold limited information and can only be read in a fixed orientation, QR codes can store much more data and can be read in any orientation. They can be scanned from any angle, making them faster and more versatile. Initially developed for the automotive industry, QR codes gradually found applications across sectors and eventually became a popular contactless payment method worldwide (Corporation, n.d.). Their adoption has been particularly transformative in the retail and service industries, where they provide a low-cost alternative to traditional point-of-sale (POS) devices. Instead of relying on expensive infrastructure, merchants of all sizes—including small and micro businesses—can now be integrated into the digital payment ecosystem using QR technology.

In practice, QR code-based payment systems work by enabling customers to transfer money digitally through a simple scan. A merchant displays a QR code, either printed or on a digital screen, and the customer scans it using a mobile payment application. The code contains the merchant's account details. The customer may either manually input the transaction amount or have it automatically filled in. After confirmation, the payment is instantly transferred from the customer's account to the merchant's account.

The growing popularity of QR code-based payments lies in their simplicity, convenience, and security. Customers no longer need to carry cash or cards, while merchants avoid the expense of

purchasing POS terminals. This cost has traditionally hindered the adoption of digital payments in many developing economies. As a result, QR codes have played a vital role in broadening financial inclusion by empowering even small vendors and individual service providers to accept digital payments with minimal investment. In both developed and emerging markets, this technology is contributing to more accessible, efficient, and inclusive financial ecosystems, reshaping the way everyday transactions are conducted.

Developments in QR-based Payments in Bangladesh

The introduction of QR-based payments has been one of the most significant developments in Bangladesh's efforts to promote a digital financial system. Initially, leading Mobile Financial Service (MFS) providers such as bKash, Nagad, and Rocket introduced their own proprietary QR payment systems in 2018. These early models allowed users to scan merchant-specific QR codes within their respective apps to make payments. However, the lack of interoperability—where a customer from one platform could not pay a merchant using another—limited the scalability and overall impact of these systems.

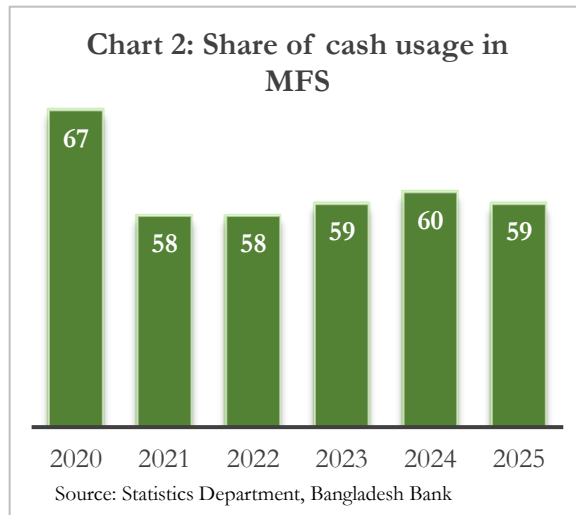
Recognizing this fragmentation, BB launched the Bangla QR initiative in January 2021 to standardize and unify QR code-based transactions across banks, Mobile Financial Service (MFS) providers, and Payment Service Providers (PSPs) (Bangladesh Bank, 2021). Bangla QR introduced a single interoperable format that allows all licensed institutions to issue and accept QR-based payments, enabling seamless transactions across platforms.

Box

Mobile Financial Services: Achievements and Gaps

Introduced in 2011, Mobile Financial Services (MFS) were designed to broaden financial inclusion, particularly among the unbanked and underbanked populations in rural and semi-urban areas. Over time, MFS has evolved as a key driver of digital and cashless payments in Bangladesh. Recent data indicate that MFS has transformed the landscape of financial transactions, enabling millions of individuals to send and receive money, pay utility bills, and make merchant payments conveniently through mobile devices. Service providers such as bKash, Nagad, Rocket, and Upay have been instrumental in this transformation. As of FY25, the number of registered MFS accounts exceeded 210 million, demonstrating deep market penetration and underscoring MFS's pivotal role in promoting financial inclusion and digital payment adoption nationwide.

Despite these achievements, MFS usage remains heavily cash-based. Although the system was intended to facilitate digital payments, approximately 59 percent of the total MFS transaction value in FY25—equivalent to BDT 10,791 billion out of BDT 18,174 billion—consisted of cash-in and cash-out operations. This indicates that MFS continues to function primarily as a cash conduit rather than a fully cashless payment platform. Even after the introduction of Bangla QR in 2021, which enabled interoperable QR-based transactions, cash remains the dominant form of payment in MFS activity (Chart 2).



A key reason is the lack of an entirely cashless ecosystem, which means MFS wallet balances often cannot be used for everyday purchases because many merchants and service providers still do not accept digital payments. Consequently, users are compelled to withdraw cash to complete transactions. Moreover, the existing Merchant Discount Rate (MDR) structure may discourage merchants—especially small vendors—from adopting digital payment systems, as transaction fees reduce their already thin profit margins. Combined with limited merchant acceptance, weak platform integration with Bangla QR, low financial literacy, and consumer preference for cash, these challenges continue to constrain MFS's potential to drive the comprehensive digitalization of retail payments in Bangladesh.

This development marked a significant advancement in payment interoperability, enabling small and medium-sized enterprises (SMEs) and micro-merchants to accept digital payments without costly point-of-sale (POS) terminals. The system operates under the National Payment Switch Bangladesh (NPSB) framework. As of FY25, the initiative encompasses 42 banks, 7 MFS providers, 3 payment service providers (PSPs)—reflecting the broad institutional participation that underpins Bangladesh’s growing interoperable payment ecosystem.

Performance of Bangla QR-based Payment System

After the Bangla QR-based payment system was launched in 2021, participants started using this platform in the latter half of FY23. However, the system became more active during FY24, as shown in Table 1. The number of transactions rose sharply to 4,679 thousand in FY24, up from 197 thousand in FY23. Despite this, the growth momentum was not as strong in FY25. The total number of transactions declined by 12.3 percent, although the overall transaction value increased slightly to BDT 21 billion from BDT 17 billion in FY24.

Another notable observation concerns the number of participants in the Bangla QR ecosystem. According to Table 1, the expansion of stakeholders to operationalize Bangla QR has been relatively slow—only 49 payment system stakeholders participated by the end of FY25, compared to 41 a year earlier, despite nearly double that number being eligible to join. This suggests that many stakeholders are not yet technically ready or are facing operational or strategic barriers to participation, which warrants further investigation and policy attention.

As discussed earlier, ATM/CRM withdrawals and MFS cash-outs are primarily used to purchase daily necessities, suggesting they could serve as a substitute for retail payments. Although transaction value from these channels has declined in recent years, the total amount—BDT 11,330 billion—remains substantial and reflects continued reliance on cash withdrawals.

Table 1: Bangla QR-based Payment System Usage			
Bangla QR-based payment	H2FY23	FY24	FY25
- Number of Transactions (in thousand)	197	4,679	4,102
- Amount (billion BDT)	1	17	21
Number of banks/MFS/PSO participated*	31	41 (92)	49 (95)
Cash withdrawals (ATM, CRM & MFS) (in billion BDT)	4,163	9,422	11,330
Source: Payment System Department & Statistics Department, Bangladesh Bank			
*Note: Figures in parentheses indicate the total number of available stakeholders in the payment system.			

Most ATM withdrawals are mainly used for cash-based retail transactions, indicating that these users represent a significant potential customer base for QR-based payments. Overall, Bangla QR-based retail payments show strong growth potential toward a cashless economy.

From a regulatory perspective, BB has taken several initiatives to expand the usage of Bangla QR-based payments. All relevant institutions were instructed to make their mobile applications compatible with the Bangla QR system and to replace proprietary QR codes with the standardized Bangla QR code. Additionally, BB directed stakeholders to undertake awareness campaigns among both customers and merchants to promote adoption.

Despite these regulatory efforts, the participation rate remains modest—only about half of the 95 available payment stakeholders are currently active—indicating a slow rate of adoption. Similarly, the relatively low transaction numbers and values suggest that consumers are not yet fully aware of the convenience and benefits associated with QR-based payments.

Another factor that may contribute to this slow adoption is the Merchant Discount Rate (MDR). Initially, BB set the upper cap for the MDR at 0.70 percent for individual merchant payments and 1.60 percent for other payment types. In January 2024, the MDR cap for micro-merchants was revised to 0.50 percent for payments via bank accounts, debit cards, and prepaid cards, and 0.80 percent for payments through credit cards, Mobile Financial Services (MFS), and Payment Service Providers (PSPs). For regular merchants, the MDR was set at 1.0 percent (for bank accounts, debit cards, and prepaid cards) and 1.20 percent (for credit cards, MFS, and PSPs), along with an additional 0.15 percent NPSB charge. Recently, in February 2025⁶, BB revised the MDR structure to a flat 1.15 percent for all merchants and withdrew the NPSB platform fee.

While this uniform MDR aims to simplify the fee structure, it may still discourage micro and small merchants—who typically operate with thin profit margins—from adopting the Bangla QR system. Further consideration of tiered or subsidized MDR rates could encourage broader participation and accelerate the shift toward digital retail payments.

In addition to introducing the interoperable QR-based payment solution under the NPSB network, BB has also taken further initiatives to enhance interoperability in fund transfers. On November 1, 2025, BB introduced an interoperable money transfer system among banks, PSPs, and MFS

⁶ PSD Circular No. 02/2025, dated 06th February 2025, Bangladesh. Bank.
<https://www.bb.org.bd/mediaroom/circulars/psd/feb062025psd02.pdf>

providers⁷. The system allows instant transfer from mobile wallets, bank accounts, non-bank accounts, or institutional accounts directly into any other account. Furthermore, to support merchants and accelerate the adoption of interoperable Bangla QR, BB mandated that payments made through Bangla QR must be credited instantly to the merchant's bank or MFS account, effective from 15th December 2025. These initiatives aim to enhance efficiency, reduce transaction frictions, and advance the development of a fully integrated digital payment ecosystem in Bangladesh⁸.

Furthermore, BB has initiated the development of an inclusive Instant Payment System (IIPS) to strengthen interoperability further and meet the growing demand for cashless payments. The initiative is being implemented in collaboration with domestic and international stakeholders, marking another significant step toward building a seamless, inclusive digital payment infrastructure.

Security Concerns in QR-Based Payment Systems

The Bangla QR code has been developed in accordance with the EMVCo⁹ standard, which provides globally recognized specifications for secure QR-based payment transactions. Accordingly, acquirers and issuers are required to adopt the security features prescribed by EMVCo for the related security. Furthermore, they must comply with the BB's "ICT Security for Banks and Non-Bank Financial Institutions" guidelines, which outline controls for secure system design, authentication, and data protection. These regulatory measures aim to strengthen the overall resilience of the Bangla QR payment ecosystem and safeguard users against emerging cyber threats.

Although QR-based payment adoption in Bangladesh is not yet as extensive as in many other countries, it is essential to recognize and address the evolving risks associated with its use. Since QR-based payments rely on smartphones and internet connectivity, users may face threats arising

⁷ PSD Circular No. 12, dated 13th October 2025, Bangladesh Bank.

<https://www.bb.org.bd/mediaroom/circulars/psd/oct132025psd12.pdf>

⁸ PSD Circular No. 14, dated 24th November 2025, Bangladesh Bank.

<https://www.bb.org.bd/mediaroom/circulars/psd/nov242025psd14.pdf>

⁹ EMVCo, originally created by *Europay, Mastercard, and Visa* (hence the acronym *EMV*), is now managed by a global consortium jointly owned by six major payment networks. EMVCo develops and maintains technical standards to ensure interoperability and security across chip cards, payment terminals, mobile payments, and online transactions. These standards help prevent fraud and strengthen the overall security of electronic payment systems. For more information, see the [EMVCo official website](#).

from weak anti-phishing¹⁰ protections and greater exposure to social engineering attacks, leading to significant cybersecurity vulnerabilities. Moreover, because QR codes are machine-readable rather than human-readable, attackers can easily embed malicious URLs (Uniform Resource Locator), phishing links, or malware without offering any visible cues to alert users.

QR codes can also facilitate advanced cyberattacks such as cross-site scripting (XSS), SQL (Structured Query Language) injection, or reader application exploitation, enabling attackers to steal user credentials, execute unauthorized commands, or access sensitive data. Payment-related QR codes are particularly at risk, as malicious actors may replace or overlay legitimate codes with fraudulent ones to divert funds. The ease of generating QR codes, coupled with limited authentication mechanisms, further amplifies these threats.

To mitigate these challenges, researchers recommend a multi-layered defense strategy that combines digital signatures and other cryptographic validation methods with machine-learning-based malicious-link detection, two-factor authentication, and user-awareness programs. Ensuring the security of QR code-based payment transactions, therefore, requires both robust technical safeguards and informed user behavior (Njuguna & Ndia, 2025).

Section VI: Peer Country Experience with QR Code-Based Payments

To reduce dependence on cash, application-based instant payment systems (APIs) are gaining popularity worldwide. To ensure instant payment processing and smooth, secure, interoperable operations, many central banks have developed dedicated platforms to handle the high volume of retail transactions.

The Central Bank of Brazil launched Pix in November 2020 as a nationwide interoperable instant payment system. Pix connects banks, fintechs, and digital wallets through a centralized infrastructure, enabling seamless payments across institutions. Users can make payments using simple identifiers, such as phone numbers, email addresses, or taxpayer IDs, or by scanning standardized QR codes. Transactions are typically processed within seconds at no cost for individuals, promoting efficiency, financial inclusion, and interoperability. The Central Bank of Brazil mandated that any financial institution with more than 500,000 accounts must join Pix. The

¹⁰ Anti-phishing protection refers to security measures—such as URL filtering, email scanning, website authentication, and warning systems—designed to detect and block deceptive attempts by attackers to steal sensitive information (e.g., passwords, bank details) by posing as legitimate entities through fake websites, emails, or messages.

system quickly gained widespread popularity, with 149 million individuals and 15 million firms using it as of December 2023. Consequently, the proportion of cash transactions declined from 42 percent in 2020 to 22 percent in 2023 (Sampaio & Ornelas, 2024).

The Monetary Authority of Singapore (MAS) launched FAST (Fast and Secure Transfers) in 2014 to enable real-time interbank payment interoperability by building a national e-payments infrastructure that facilitates simple, swift, seamless, and secure payments. Initially, the uptake of FAST among corporates and smaller businesses was limited until 2016–17. In 2017, MAS introduced PayNow under the FAST payment system, an overlay service that enables payments via QR code scanning. Both individuals and entities can perform PayNow transfers by scanning the PayNow QR code through the mobile banking applications of participating banks. The launch of PayNow significantly boosted the adoption of the FAST payment system. By 2024, the volume of FAST transactions had reached 500 million (valued at S\$661,748 million), compared to just 39 million transactions (valued at S\$73 million) in 2017 (*Case Study: Singapore*, n.d.).

Malaysia implemented its interoperable payments framework with DuitNow, launched by PayNet under the Real-time Retail Payments Platform (RPP) in December 2018. DuitNow allows real-time fund transfers 24/7 using simple identifiers such as mobile numbers, national ID (MyKad), business registration, or passport numbers. The country also introduced a unified QR payment standard, DuitNow QR, under the Interoperable Credit Transfer Framework (ICTF), enabling any participating bank or e-wallet app to scan a standard QR code at merchants regardless of provider.

In 2021, Bank Negara Malaysia (BNM) and the Bank of Thailand (BOT) launched a cross-border QR payment linkage between Malaysia and Thailand. Under this linkage, consumers and merchants in both countries will be able to make and receive instant cross-border QR code payments using DuitNow and PromptPay (Thailand's QR Code-based payment system) platform.

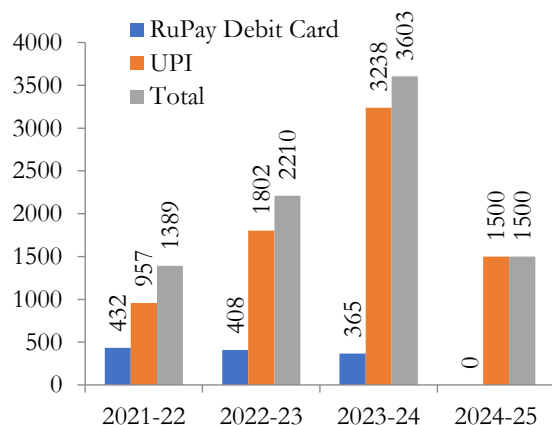
In 2023, Malaysia further enhanced cross-border interoperability by linking DuitNow with Singapore's PayNow, enabling instant P2P transfers between the two countries. The use of DuitNow QR codes continued to increase given their convenience, lower cost, and wide coverage. There are 2.6 million registered DuitNow QR acceptance points across Malaysia as of the end of 2024. It helps promote greater adoption of e-payment in Malaysia. In 2024, per capita e-payments transactions reached 409, compared to 170 in 2020 (BNM Annual Report, 2024; BNM Annual Report, 2025).

India has achieved remarkable success in cashless retail payments through the Unified Payment Interface (UPI). The Reserve Bank of India (RBI) and the National Payments Corporation of

India (NPCI) have played key roles in this achievement. Established in 2008 by RBI and the Indian Banks' Association (IBA) under the Payment and Settlement Systems Act (2007), NPCI launched UPI in 2016 to connect financial stakeholders and facilitate QR code payments. UPI allows users to link their bank accounts to a unique virtual payment address (VPA), significantly streamlining transactions. RBI and NPCI also promoted Bharat QR and UPI QR codes, enabling low-cost, contactless payments for small merchants and reducing dependency on cash.

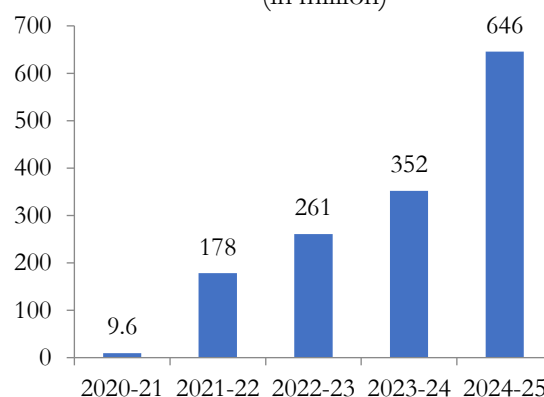
To promote digital transactions, India introduced several subsidy measures. Since January 2020, the Merchant Discount Rate (MDR) has been set to zero for RuPay¹¹ Debit Cards and UPI transactions, with the government covering associated infrastructure costs through the “Incentive Scheme for Promotion of Low-Value BHIM-UPI Transactions.” In FY25, ₹1,500 crore was spent under this scheme, compared to ₹1,389 crore three years earlier, covering small merchant payments of up to ₹2,000. The MDR subsidy rate decreased from 0.25 percent in FY24 to 0.15 percent in FY25 (excluding some bill payments).

Chart 5: Subsidy for MDR by Govt. of India
(in crore rupee)



Source: Ministry of Finance, Government of India.

Chart 6: Number of QR Code in India
(in million)



Source: Reserve Bank of India

Note: Figures are as on last day of Fiscal Year (March, 31)

In January 2021, the RBI launched the Payments Infrastructure Development Fund (PIDF) scheme to subsidize digital payment acceptance infrastructure, such as Point of Sale (PoS) terminals and QR codes, in underserved regions. With a corpus of ₹1,467 crore—₹250 crore from

¹¹ RuPay debit card is an alternative low-cost card to international cards, which is accepted at all ATMs, POS machines, and online platforms within India.

RBI, ₹474 crore from authorized card networks, and ₹743 crore from card-issuing banks—PIDF had disbursed ₹542 crore by November 2023. As of November 2023, 27 million QR codes had been deployed under the scheme.

India also organized initiatives such as Digital Payments Awareness Week and related campaigns to build trust and awareness among users. These efforts, combined with government subsidies and the COVID-19 pandemic's push toward contactless payments, have driven exponential growth in QR code adoption. By the end of FY21, only 9.6 million QR codes had been deployed, rising dramatically to 646 million by FY25.

The experiences of peer countries demonstrate that modernizing payment systems—particularly through fast and interoperable digital solutions—can significantly enhance financial inclusion, reduce cash dependency, and improve transaction efficiency. Common success factors include strong regulatory frameworks, coordinated stakeholder engagement, and adoption of international standards. Bangladesh can draw valuable lessons from these cases, tailoring global best practices to its domestic context to foster a safe, efficient, and widely accessible digital payment ecosystem.

Section VII: Challenges and Recommendations

Bangladesh has made notable progress in promoting QR code–based payments through the Bangla QR initiative. However, the transition toward a fully digital retail payment ecosystem remains uneven. Despite having substantial mobile and internet penetration—188.57 million active mobile connections and 120.87 million internet users as of July 2025¹²—the actual use of QR-based payments remains relatively low. Beyond limited merchant adoption and insufficient stakeholder participation in the unification of Bangla QR, the main challenges lie in users' lack of awareness, trust, and familiarity, as well as the underdeveloped financial ecosystem that constrains broader adoption.

Challenges

Partial Adoption by Major Providers

Leading Mobile Financial Service (MFS) providers have yet to fully integrate Bangla QR for both issuing and acquiring transactions. This partial integration has resulted in frequent transaction failures in practice, despite interoperability being established in principle. Moreover, of the 95

¹² Source Bangladesh Telecommunication Regulatory Commission (BTRC), <https://btrc.gov.bd/site/page/0ae188ae-146e-465c-8ed8-d76b7947b5dd/-> and <https://btrc.gov.bd/site/page/347df7fe-409f-451e-a415-65b109a207f5/->

payment service stakeholders, including 61 banks, only 45 have integrated the Bangla QR code into their respective application-based platforms. This reflects a relatively low participation rate and highlights the need for stronger coordination and regulatory enforcement to achieve seamless nationwide adoption

Reliance on Cash for Supply Chains and Low Merchant Adoption

Many small merchants in Bangladesh still rely on cash when purchasing goods from wholesale markets. In the absence of fully digitized supply chains, cash continues to play an essential role in day-to-day business operations, thereby interrupting the continuity of cashless transactions. This presents a significant challenge in promoting the adoption of QR-based payment systems. Furthermore, some merchants who have adopted QR payments display multiple QR codes for different service providers, causing customer confusion and undermining the operational efficiency and interoperability intended by the Bangla QR system.

Limited Financial Literacy and Consumer Awareness

Although mobile and internet access are widespread, many users remain unaware of how QR payments work or view them with suspicion. Low financial literacy, distrust in digital platforms, and the absence of practical guidance discourage adoption among both merchants and consumers, especially in rural areas where cash habits remain deeply entrenched.

Technological and Access Barriers

Mobile payment applications often differ in design, navigation, and transaction processes, creating inconsistent user experiences. For new users—particularly those with limited technological familiarity—complex registration steps, transaction failures, or unclear interfaces can deter continued use. The lack of localized interfaces and responsive customer support further limits accessibility.

Cost of Acceptance for Merchants

The uniform Merchant Discount Rate (MDR) of 1.15 percent remains a major deterrent for micro and small merchants who operate on thin profit margins. For low-value, high-volume transactions, this fee structure discourages the acceptance of digital payments and reinforces reliance on cash.

Institutional Support Gaps

Bangladesh currently lacks a dedicated institution solely responsible for managing retail payment and settlement systems, which can slow development and limit operational efficiency. The ongoing

Unified Instant Payment Infrastructure (UIPI) initiative aims to address this gap by creating an interoperable framework for instant payments. Building on this initiative, establishing a specialized corporation under BB could further strengthen oversight, enhance interoperability, and reduce operational pressures on existing systems, supporting the growth of a robust and scalable digital payment ecosystem.

Recommendations

Building a Fully Integrated Payment Ecosystem

The BB, in collaboration with major service providers, should ensure full interoperability by mandating the complete integration of Bangla QR for both issuing and acquiring payments. Simultaneously, digitization across supply chains should be promoted to enable small merchants to purchase wholesale goods electronically. Targeted incentives—such as transaction-fee rebates or small-value cashback—could encourage broader adoption among both merchants and consumers.

Enhancing Financial Literacy and Public Awareness

Given that internet and mobile penetration are already high, the primary challenge lies in motivating existing users to adopt digital payments. National and local-level awareness campaigns should focus on building trust, explaining QR payment processes, and addressing security concerns. Collaboration among the BB, MFS providers, commercial banks, and local government bodies can help deliver community-based training at the upazila level, demonstrating the simplicity and safety of QR transactions and promoting everyday use.

Improving Usability and User Experience

A consistent and user-friendly interface across QR payment applications is essential for sustainable adoption. BB could issue usability and accessibility standards to ensure app consistency and intuitive design. Introducing Bangla language interfaces, simplified onboarding procedures, and one-tap payment options can help users with limited digital literacy. To ensure a seamless and fully interoperable payment experience, all merchants must adopt and display only the standardized Bangla QR Code in accordance with regulatory guidelines.

Reducing the Cost Burden on Small Merchants

A tiered MDR structure should be adopted to make QR acceptance financially viable for small and micro businesses. Merchants with low transaction volumes could receive exemptions or reduced

rates, while larger enterprises pay proportionate fees. Temporary subsidies or donor-backed support programs can further offset transaction costs during the early stages of adoption.

Strengthening Institutional Capacity

To ensure effective governance and future innovation, Bangladesh should establish a Retail Payment and Settlement Corporation under the BB. This entity would coordinate risk management, ensure interoperability, oversee the UIPI framework, and introduce new technologies such as instant QR settlements and offline payment mechanisms. Focused oversight would also help streamline stakeholder collaboration and accelerate the country's transition toward a cashless retail payment ecosystem.

Collaborate with International Payment System Experts

The Payment Systems Development Group (PSDG) of the World Bank has supported over 120 countries in modernizing their payment systems and, more recently, has taken a leading role in global research and providing technical assistance on fast payment systems. Project FASTT marks a significant milestone in this effort and is supported by the Bill & Melinda Gates Foundation through the Finance for Development (F4D) Umbrella Program. Bangladesh could benefit from collaborating with such organizations, leveraging their extensive experience to develop infrastructure that enables frictionless, affordable, secure, and instant transactions.

By addressing these challenges through coordinated policy, infrastructure support, financial incentives, and awareness programs, Bangladesh can significantly accelerate the adoption of QR code-based payments and foster a more inclusive cashless economy.

Section VIII: Conclusion

The transition toward a cash-lite economy in Bangladesh is at a decisive stage. Although notable progress has been achieved with the introduction of the interoperable Bangla QR system, the adoption of QR-based payments remains slow compared to peer economies. The continued dominance of cash—accounting for 35 percent of formal retail transactions in FY25—indicates that infrastructure alone is insufficient to drive behavioral change among consumers and merchants. The findings of this study highlight both supply-side and demand-side constraints that inhibit wider adoption, including the slow integration of major payment participants, uneven technological readiness, limited merchant onboarding, persistent consumer preference for cash, gaps in trust and awareness, and the absence of a simple, unified application-based interface.

International experiences from India, Brazil, Malaysia, and other economies demonstrate that rapid scaling requires a strong instant payment interface, low-cost transactions, targeted public awareness, and fully interoperable platforms. Drawing on these lessons, this study underscores the need for a dedicated, API-based unified retail payment interface in Bangladesh—one that connects all issuer and acquirer types, including banks, MFS providers, PSPs, wallets, and fintechs. Bb's ongoing initiative to develop an Inclusive Instant Payment System (IIPS), supported by the Gates Foundation, represents a significant step in this direction. However, successful operationalization will require sustained stakeholder engagement, investment in digital infrastructure, enhanced fraud-monitoring capabilities, and continued efforts to improve usability and trust.

To ensure that the upcoming IIPS effectively addresses existing interoperability limitations, further research is essential. In-depth, organized surveys involving users, payment participants, merchants, fintech companies, and industry experts would provide deeper insights into the root causes of low adoption of interoperable QR systems. The results from such research would help identify practical strategies to enhance usability, build trust, and boost operational efficiency. Additionally, learning from neighboring countries through site visits and knowledge-sharing initiatives would give Bangladesh direct understanding of the challenges they faced and the policy measures that facilitated rapid adoption. These evidence-based insights will be vital for designing a strong and user-oriented IIPS tailored to Bangladesh's unique context.

Given the scale and complexity of the emerging payment landscape, this study also proposes establishing a dedicated Retail Instant Payment and Settlement Corporation (RIPSC) regulated by BB. Such an institution could strengthen governance, address operational bottlenecks, enhance system resilience, and support continuous innovation in the retail payment space.

Although the IIPS initiative is still early in its development following the signing of an MoU, the measures recommended in this study could significantly increase acceptance of Bangla QR, reduce reliance on cash, and accelerate the transition to interoperable digital retail payments. Together, these actions would support Bangladesh's broader move toward a modern, efficient, and increasingly cashless economy.

Finally, this study acknowledges certain limitations. Due to time and resource constraints, we were unable to conduct structured interviews with QR payment users, merchants, or payment participants. However, insights were gathered through discussions with officials from the Payment Systems Department and through personal user experiences, which helped identify key

bottlenecks. A more comprehensive and rigorous picture could be developed through a dedicated survey addressing these limitations, which is recommended for future research.

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