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# Payment modernization

Supporting the evolution of global commerce

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# Introduction

In the last two decades, consumers around the world have recast the basic definition of what it means to bank. It's a shift driven by a rise in agile, technology-first fintech players that have made deep inroads into the banking ecosystem where traditional institutions once held sway. This is particularly evident in the realm of payments modernization — which is all about accelerating transactions, enhancing customer experiences, and securing financial interactions in an increasingly interconnected digital economy.

New entrants are increasingly disintermediating the relationship between banks and their customers — allowing consumers to enjoy the speed, ease, and direct access of third-party payment capabilities offered by the likes of Apple Pay, Google Pay, Alipay, Trustly, Tink, and Venmo.

New players are also developing alternative payment systems that bypass traditional banking networks. These include blockchain-based systems, peer-to-peer mobile applications, and digital wallets that allow users to send and receive money globally without a bank account. Mobile money platforms like M-Pesa in Africa, launched in 2007 by Vodafone and Safaricom, provide an example of how non-bank financial products can achieve widespread adoption.

One of the main challenges for financial services enterprises looking to embrace a more modernized payments approach is limited capabilities of core systems. Many back-end systems cannot adapt to modern payment demands, forcing workarounds that create bottlenecks in transaction processing, increase risk exposure, and pump-up costs over time.

Banks prioritize investing in direct, peer-to-peer payment options such as Zelle, Venmo, CashApp and Pay by Bank to give their customers a fast and easy way to pay. But many still struggle with the back- and middle-office application interfaces required to connect to these third-party systems.

The demand for a real-time economy is growing as businesses, consumers, and financial systems evolve. The capability to process transactions, manage treasury functions, and conduct financial operations in real time carries significant implications for economic efficiency, capital utilization, and innovation.

For businesses, the ability to manage money in real time is critical. It allows enterprises to monitor and control cash flow, liquidity, and working capital instantly, rather than waiting for end-of-day settlements or delayed processing times. This level of efficiency can significantly enhance decision-making, allowing companies to deploy capital more effectively and reduce the need for costly short-term borrowing.

Additionally, for multinational corporations, real-time financial systems simplify the management of global operations. Companies can more easily manage foreign exchange risks, execute cross-border transactions, and reconcile accounts across different jurisdictions. This reduces the complexity and cost of maintaining multiple banking relationships and treasury centers, enabling a more unified and streamlined approach.

From a consumer perspective, real-time payments mean instant access to funds. Whether receiving a salary, paying bills, or transferring money to friends and family, real-time payment systems offer unparalleled convenience and flexibility. This immediacy can improve financial management for consumers, reducing the stress associated with delayed payments, combatting innovative forms of fraud, or the need for overdrafts.

The development of real-time payment infrastructure is a cornerstone of the real-time economy. Systems like TIPS and SEPA Instant in Europe, FedNow in the United States, and other real-time gross settlement (RTGS) systems globally are enabling instant transfers of funds between banks and financial institutions. These systems are essential for both corporate and consumer use, facilitating everything from large-scale corporate payments to everyday transactions.

As the infrastructure for real-time payments continues to develop, and as businesses and consumers adapt to the possibilities it offers, we can expect to see significant economic and societal changes. The real-time economy is not just about faster transactions; it's about creating a more connected, efficient, and dynamic financial ecosystem that supports growth and innovation.

# Big data and emerging technology

The ability to harness data in consumer payments represents a significant opportunity for financial institutions to enhance customer experiences. By providing timely, relevant, and personalized advice, banks can deepen their relationships with customers and differentiate themselves in an increasingly competitive market.

Big data has been a powerful force in finance, enabling the creation of credit scoring models and predictive analytics. However, its potential in consumer payments is only beginning to be realized. Financial institutions, particularly banks, have a unique opportunity to leverage the vast amount of transactional data they hold to offer more personalized, meaningful services to their customers.

## The shift to real-time

Traditionally, banks have used consumer data to assess creditworthiness through credit scores. These scores have been instrumental in determining the likelihood of loan repayment. However, as data collection and analysis capabilities advance, banks can move beyond static credit scores to more dynamic, real-time financial insights.

This shift from reactive to proactive financial management represents a new level of customer service. By analyzing transaction data, banks can offer customers highly personalized financial advice. For example, if a customer's electricity bill has increased significantly compared to the previous year, the bank could automatically identify this trend and alert the customer. The bank could then provide suggestions for alternative energy providers or tips on reducing consumption based on real-time market data and historical spending patterns.

In other examples, banks could notify a customer if their spending on groceries consistently exceeds their budget, or if they are on track to save less than planned for a vacation. These insights could be delivered via personalized notifications through mobile banking apps, helping customers more effectively manage their finances.

## Intersection with AI

Artificial intelligence is increasingly being used to drive predictive analytics and automated processes in banking. Its ability to analyze datasets to identify patterns and make predictions about future behavior is improving decision-making. For example, AI could predict a customer's likelihood of defaulting on a loan based on their transaction history, spending patterns, and other external data sources like economic indicators or employment trends.

AI can also be used to create long-term financial forecasts for customers. By analyzing data such as income levels, spending habits, or home purchases, AI can provide insights into a customer's future financial needs and challenges. These insights could include predicting retirement savings shortfalls or identifying periods where the customer may need to borrow money.

AI may also soon enable automated financial planning. For example, if a customer is consistently overspending in certain categories, AI could automatically adjust their budget or suggest changes to their spending habits. AI could also help customers optimize their investment portfolios by analyzing market trends and personal risk tolerance.

As banks and financial institutions harness more data to offer personalized services, they must navigate the complex landscape of data privacy and AI rules. Customers want their data to be handled securely and ethically. That may involve enterprises adopting robust data protection measures and being transparent about how customer data is used. Clear options to opt-in or out of these services will be crucial to maintaining trust.

According to the 2025 Kyndryl U.S. Payments Transformation Survey, financial services leaders identify fraud prevention (74%) and customer support (63%) as top use cases for AI. With its ability to analyze data in real time to identify fraudulent transactions, AI can improve security and customer satisfaction. AI also can detect threats and help organizations recover quickly from cyberattacks.

74%

of financial services leaders identify fraud prevention as top use cases for AI.

63%

of leaders in the financial services sector report that customer support is the primary use case for AI.

Source: 2025 Kyndryl US Payments Transformation Survey

# Payments and privacy

As payment systems around the world undergo rapid modernization—driven by innovations like real-time payments, digital wallets, and central bank digital currencies (CBDCs)—privacy has become a growing concern. These systems promise speed and convenience, but they also introduce complex risks, especially when transactions cross borders and regulatory regimes diverge.

At the heart of the challenge is the movement of personal financial data across jurisdictions. In a globalized payments ecosystem, a single transaction might involve banks, fintech platforms, cloud providers, and regulators in multiple countries. Each of these players may operate under different standards for data protection. For instance, an EU citizen using a U.S.-based app to send money abroad may have their data processed in countries with fewer privacy safeguards. That can create tension between operational efficiency and regulatory compliance.

Regulations establish a standardized cybersecurity and data protection framework, which fosters trust and confidence in digital transactions, and helps mitigate the potential for financial losses and disruptions.

## The patchwork challenge

That tension is magnified by the patchwork nature of global privacy regulations. The European Union's General Data Protection Regulation (GDPR) is often held as a gold standard, requiring strict conditions for data processing and transfer. But other regions vary widely. The U.S., for example, lacks a comprehensive federal privacy law, while many countries in Asia and Africa are still developing their legal frameworks. The result is a fragmented landscape that places a heavy burden on payment providers to navigate varying definitions of personal data, consent, and user rights.

Meanwhile, the shift toward real-time payments—where transactions settle in seconds—requires fast and often intensive identity verification. While the payment industry is developing solutions such as the tokenization of payment credentials and improved encryption methods, this speed can inadvertently expose more personal data than necessary. In systems that rely on open banking, third-party providers may gain access to account details or transaction histories beyond what's needed for a single payment. Users may not even be aware of the scope of data sharing involved.

## Biometric questions

Another dimension of modernization is the increasing use of biometric and behavioral data for authentication. Fingerprint scans, facial recognition, and even keystroke patterns are becoming common tools to secure digital payments. While these methods can enhance security, they introduce a new class of privacy risk: biometric data is deeply personal and, unlike a password, cannot be changed if compromised. Not all countries have laws governing how this sensitive data should be collected, stored, or shared.

In some parts of the world, modernization is closely tied to the roll out of national digital identity systems. Countries such as India have integrated payments with Aadhaar, the country's biometric ID program. Countries in Europe are in the process of following suit. While digital identity systems can enable financial inclusion at scale, depending on design and security levels, they can also spark debate over user consent and the potential for surveillance, especially when participation in such systems is effectively mandatory.

## Considering AI

The growing adoption of AI and use of data in global payments raises new concerns around data privacy, ethical use, and regulatory compliance. As banks and fintechs build AI-powered personalization into their platforms, they must do so with transparency and trust at the core. Customers expect not only meaningful insights, but also control over how their data is collected and used.

This means institutions must consider adopting clear consent mechanisms, allowing users to opt into (or out of) AI-driven services. They'll also need to adhere to evolving regulatory standards, particularly as global frameworks—such as the EU's AI Act or various national data protection laws—shape how AI can be deployed responsibly across borders.

## Cybersecurity implications

Cybersecurity is another critical concern. As payment ecosystems become more reliant on cloud infrastructure and third-party APIs, the risk of data breaches increases. When something goes wrong, accountability can be difficult to trace — was it the bank, the app, the cloud provider, or a vendor? In such complex systems, even one weak link can potentially expose users' financial and personal information.

Fraud and third-party risk management are top barriers to achieving a modern payment ecosystem. The complexity and sophistication of modern fraud techniques and the stringent requirements of anti-money laundering and other such compliances create substantial challenges.

Bad actors aren't just going after the bank itself; they're also looking for ways to exploit critical third-party providers of services. Banks' and financial institutions' growing dependence on these external entities comes with increased scrutiny from regulatory bodies and a strategic imperative for safeguarding an organization's reputation and operational integrity.

Finally, there's the issue of data monetization. Payment data is incredibly valuable — not just to financial institutions but to advertisers, insurers, and credit scorers. As payment providers collect more detailed profiles of consumer behavior, there's a growing risk that this data will be used in ways users didn't anticipate or explicitly consent to. In jurisdictions with weak consumer protections, this can lead to significant privacy erosion.

## The evolution of payment fraud

Across our increasingly digitalized global economy, payment fraud is evolving fast. Jurisdictions have sought to deal with authentication fraud. Now they're shifting their focus to impersonation fraud.

But fraudsters are finding new and creative ways to exploit financial systems by creating fake identities with a combination of real and fabricated personal data. Known broadly as synthetic identity fraud, this variety of theft is rapidly becoming one of the most prevalent forms of financial crimes globally.

Unlike traditional identity theft, criminals creating these synthetic identities (SIDs) are often able to pass verification checks, establish credit histories, and operate undetected for long periods of time before going on to commit fraud. And in a globalized market now-dominated by digital banking services — particularly in a post-pandemic environment — the attack surface for such fraud has expanded tremendously. That makes it harder for institutions to detect fraudulent activity. In fact, traditional fraud detection systems are often ineffective in identifying highly complex SIF operations.

In the future, additional forms of fraud may emerge, fueled by AI and the increased interconnectivity between telecommunications, social platforms, and payment providers. The risk of fraud will also be more immediate with the rise of instant payment solutions.

This evolution raises questions about the appropriate allocation of liability between payment service providers, telecommunications providers, and customers. Navigating these future scenarios will require more collaboration and information sharing between all parties involved in the customer journey.

# Global payments by region

## United States

The last few years have dramatically transformed how U.S. financial institutions process payments. The changes come in response to customer demands for superior onboarding and service experiences, hyper-personalized products, and competitive pricing and offers.

Real-time payment capabilities are in particularly high demand. This is a crucial moment for financial services leaders, who are tasked with anticipating the needs and preferences of their customers while managing risk in an increasingly volatile environment.

Kyndryl surveyed 105 U.S. financial services IT and business leaders to learn how they are evolving their payments landscape. The results suggest that the future of payments hinges on regulatory compliance and security, the modernization of legacy infrastructure and applications, and the strategic use of AI.

78%

Financial leaders say compliance is the most critical action area to enable payment modernization.

58%

Financial leaders point to application interfaces as the most common operational challenge.

46%

Financial leaders say legacy systems and applications are top barriers to achieving modern payment environments.

Source: Kyndryl US Payments Transformation Survey (2025)

## Europe

In Europe, payments modernization work has been underway for more than a decade.

- **Setting a common standard across the Eurozone.** In 2008, the EU launched the Single Euro Payments Area (SEPA), which established common standards to simplify cross-border payments, reduce fees, and speed up transactions across the Eurozone.
- **Then payments got faster.** In 2017, Europe made SEPA stronger by introducing Instant Credit Transfer, which enabled immediate payments across banks in seconds, available 24/7.
- **Fintechs got more access to the action.** In 2018, the revised PSD2 regulation mandated that banks open customer data securely to third-party providers. That was meant to spark innovation and competition, as fintechs got in on the action and offered more personalized services to people for dealing with their money.
- **Addressing the rising role of third-party providers.** The negotiations on the EU's third Payment Services Directive (PSD3) and Payment Services Regulation (PSR) are underway. These regulations could for the first time recognize wallet providers as technical service providers, as well as update rules regarding fraud.
- **Preparing for the digital euro.** The European Central Bank (ECB) and EU legislators are working towards a retail digital euro with rules on mandatory acceptance.

## India

India has witnessed a rapid transformation in its payment systems, driven by technological innovations.

- **UPI is at the heart of this effort.** Launched by the National Payments Corporation of India (NPCI) in 2016, UPI is a real-time payment system that enables instant money transfers between bank accounts via mobile apps. Its adoption has revolutionized digital payments in India, with transaction volumes growing exponentially.
- **High ambitions to expand UPI domestically and internationally.** While UPI is now being used by 450 million users across India, the NPCI and the Government of India plan to expand the user base by an addition 300 million users in the coming years. The NPCI is also forging partnerships with payment systems in partner countries to internationalize UPI — the system is currently operational in France, Singapore, the United Arab Emirates, Bhutan, Sri Lanka, Nepal, and Mauritius, with plans to expand to 20 countries by 2029.
- **Piloting a digital currency program.** The Reserve Bank of India (RBI) initiated a pilot for the e-rupee in December 2022. Initially, the Indian central bank only permitted banks to offer e-rupee via their mobile applications, but in mid-2024 it said payment firms could also offer e-rupee transactions via their platforms once approved by the RBI. That got the attention of GooglePay, Walmart-backed PhonePe and AmazonPay.

## Japan

Traditionally a cash-centric society, Japan slowly embraced digital payment solutions.

- **The government of Japan is taking steps to promote a cashless society.** It's started by introducing systems allowing companies to pay salaries digitally without routing through traditional bank accounts. In 2018, the Ministry of Economy, Trade and Industry (METI) formulated the "Cashless Vision," which proposed measures for Japan to move towards becoming a cashless society. As of the end of 2024, the cashless payment ratio was 42.8%, exceeding METI's target of 40% by 2025. The next long-term target has been set at 80%. Japan's cashless payments ratio remains low among developed nations, trailing countries such as the U.S., United Kingdom, and South Korea.
- **Banks are also playing a role in Japan.** They have been adapting to digital transformation to better serve customers and monetize value. Efforts include offering mobile apps that empower users to manage their accounts, transfer funds, and pay bills digitally. Yet the number of bank ATMs in Japan is declining slowly, given customers' frequent usage of ATMs to withdraw cash and to charge cashless services via bank transfers.
- **Digital currency is in the mix.** In December 2024, Ueda Kazuo, the Governor of the Bank of Japan, spoke at the Center for Financial Industry Information Systems. In his speech he highlighted that the Bank of Japan is conducting pilot programs for a general-purpose CBDC, focusing on technical feasibility and exploring potential use cases. Project Agorá is an experimental project aimed at improving cross-border payments, primarily increasing their speed and lowering their costs, by utilizing new technologies such as DLT and smart contracts. The Bank has maintained that the CBDC would not replace but rather supplement existing payment services, and that the pilot program does not mean it has committed to introducing a digital yen.

# Market imperative

As global payments become faster, more digital, and more customer-centric, one principle stands out as essential to making it all work: interoperability. The ability of payment systems, platforms, and technologies to work seamlessly across borders, currencies, institutions, and providers is what ultimately defines a modern payments ecosystem. But achieving this level of fluidity doesn't happen by chance — it requires thoughtful transformation within enterprises, starting with the IT estate.

Interoperability isn't just a technical feature; it's a business imperative. For global enterprises, the ability to move money across markets, settle transactions in real time, and deliver consistent customer experiences depends on whether their internal systems can "speak the same language" — not only with one another, but with partners, banks, payment networks, and regulators worldwide. In this environment, siloed or outdated IT infrastructure becomes a roadblock to progress.

But to get there, enterprises need to treat payments modernization not as an isolated upgrade, but as part of a broader digital transformation strategy. That means aligning payments capabilities with enterprise architecture, data governance, cybersecurity frameworks, and compliance protocols. It means investing not only in the right technologies, but in the organizational agility to evolve with them.

## Prioritize security

Banks and financial institutions need to take a holistic view in addressing payments modernization challenges through technology. In the context of running secure systems, using API integrations, blockchain technology and enhanced biometric verification helps to ensure a secure, compliant and reliable payment transformation, ultimately turning risk management into a strategic advantage.

Organizations can approach this transition in a structured way by creating a roadmap for modernization, keeping in mind the interdependencies among core and newly implemented technologies.

Another key element of maintaining compliance and reducing fraud is prioritizing high-quality protocols such as ISO 20022, a global bank-to-bank messaging standard. ISO 20022 is slated to become the standard across U.S. financial services in July 2025 and required for cross-border payments via SWIFT starting in November 2025.

## Update core systems

Financial institutions must prioritize infrastructure and applications modernization to enable growth while reducing compliance risk. Doing so allows for greater flexibility to accommodate the growing volume of digital transactions and shifting customer preferences.

Successful strategies include adopting a phased approach, implementing a microservices architecture and leveraging cloud computing to enhance scalability and security.

Key components of the strategy involve integrating emerging technologies like blockchain and sophisticated AI deployments, and implementing hyper-personalized CX/UX. None of these are turnkey motions, but the investments can unlock real-time transaction processing, advanced security features and increased application interface flexibility.

## Seize AI's potential

Business leaders' lack of confidence in their organization's ability to leverage AI highlights the pressing nature of the need to invest in robust AI infrastructure, according to the 2025 Kyndryl AI Readiness Report. Outdated systems limit the ability to use AI, indicating a need to modernize infrastructure, applications and data connectivity to realize AI's actual benefits.

Adopting AI technology is a multi-step process. The first step is to develop an AI strategy that addresses risk, mainly focusing on data privacy, regulatory requirements, audit, and compliance. Next is to prioritize specific use cases that provide immediate benefits, such as customer service, customer onboarding, and fraud detection. Finally, enterprises should adopt a phased deployment of AI across the organization.

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