



**PAYMENTS MODERNIZATION**

**JANUARY 2022**

# Setting out: Planning your route to payment system modernization



# Introduction

Payment system modernization involves the majority of participants in the financial services ecosystem, including central infrastructures, banks, fintechs and ultimately any payments provider offering services directly to governments, corporates, merchants or consumers.

The world's payments entities must become sharply focused on their end users, and continuously adapt in order to protect and grow revenue streams, streamline costs and unlock new opportunities by delivering improved, innovative propositions.

## Introducing a new series of insights

Payment system modernization can be a daunting and complex journey. That's why we've reviewed 81 global markets, including 61 real-time markets, to develop a series of fresh insights that will help payments entities better understand the different elements and guide them through the process.

This new series is all about sharing best practice, providing information and examples to help stakeholders across the financial services value chain map out their own strategy. It's relevant to anyone seeking to better understand payments modernization, in addition to the drivers behind the profound industry changes being seen throughout the world.

The opening chapter outlines what we mean by payments modernization, looking at how different countries have taken different paths, shaped by a diverse range of needs, drivers and influences. Subsequent chapters will examine themes including: how the rise in non-cash transactions is powering the digital economy; the rapid and widespread development of real-time payments systems; how ISO 20022 has become an increasingly prominent feature of payments modernization discussions; and how exponential gains to computing processing power and communications bandwidth have made it possible to deploy to the cloud securely for increasingly complex and critical payment application workloads. The final chapter will shine a light on the value-added services that are overlaid onto the infrastructure, providing access and innovation ("overlays").

Mastercard helps countries, banks and businesses to modernize their payments systems. Underpinning our work is Mastercard's multi-rail strategy, which brings together card, bank account and alternative digital propositions (e.g. cryptocurrencies/Central Bank Digital Currencies) to cater to a broader range of payment types and experiences.

We've established ourselves as a trusted partner because we don't just talk about real-time payments systems and surrounding services, we deliver them every day. Mastercard is powering real-time payments in 15 of the world's markets, including 13 of the top 50 countries by GDP.

## Building your framework

This diverse global experience has taught us that payments modernization is a unique journey for each market. The perspective of what you're looking for will be shaped by where you're looking from, and one country's outlook and approach may be completely different to another's.

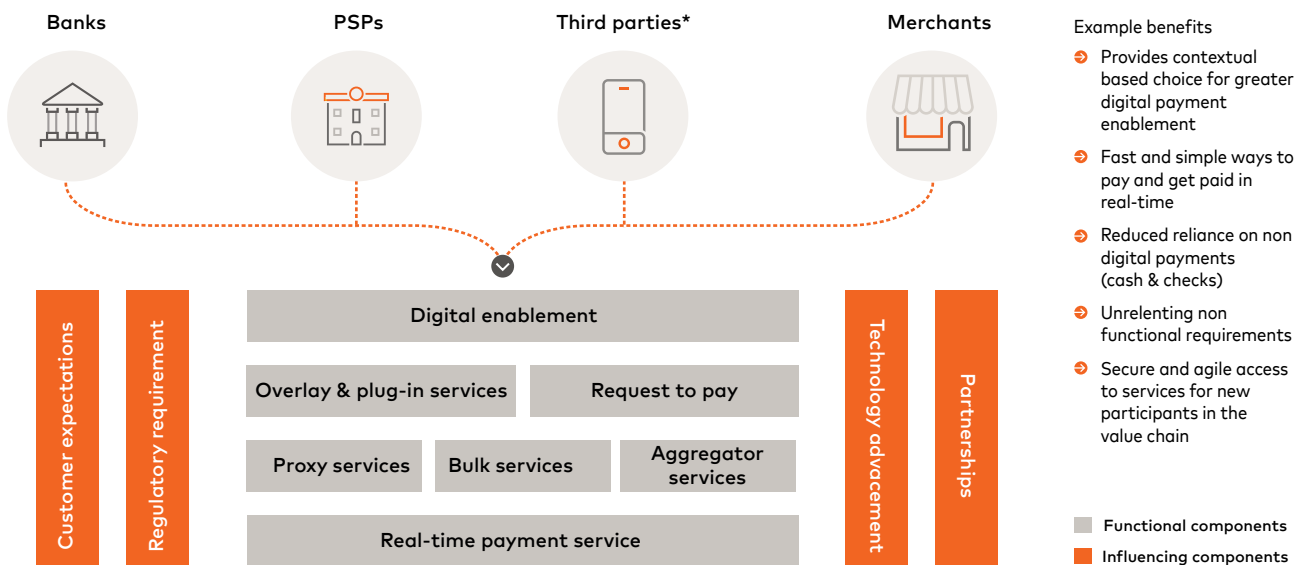
Historically, there has been no 'one-size-fits-all' scenario, but the opportunity to standardize does exist. The reason we see so many differences is that developments have traditionally been domestically-focused, without a global perspective. Mastercard brings this global perspective.

We have identified some key factors that countries and organisations should consider when planning their modernization programmes. Building blocks that can facilitate the implementation journey and offer up a safe, secure and resilient platform that ensures an open, inclusive and innovative environment that allows new value-added services to thrive.

Another measure to achieve greater success is to ensure that the participant layers, i.e. the end-to-end processing environment, is in sync to provide compatibility for the enablement of services such as data and overlays.

The following diagram highlights the building block approach which will be broken down across our payments modernization series to show the value of each section.

Payment system modernization – building blocks



\*Entity that provides services that compliments the facilitation of payments e.g. Open banking, identity or mobile app provider(s)

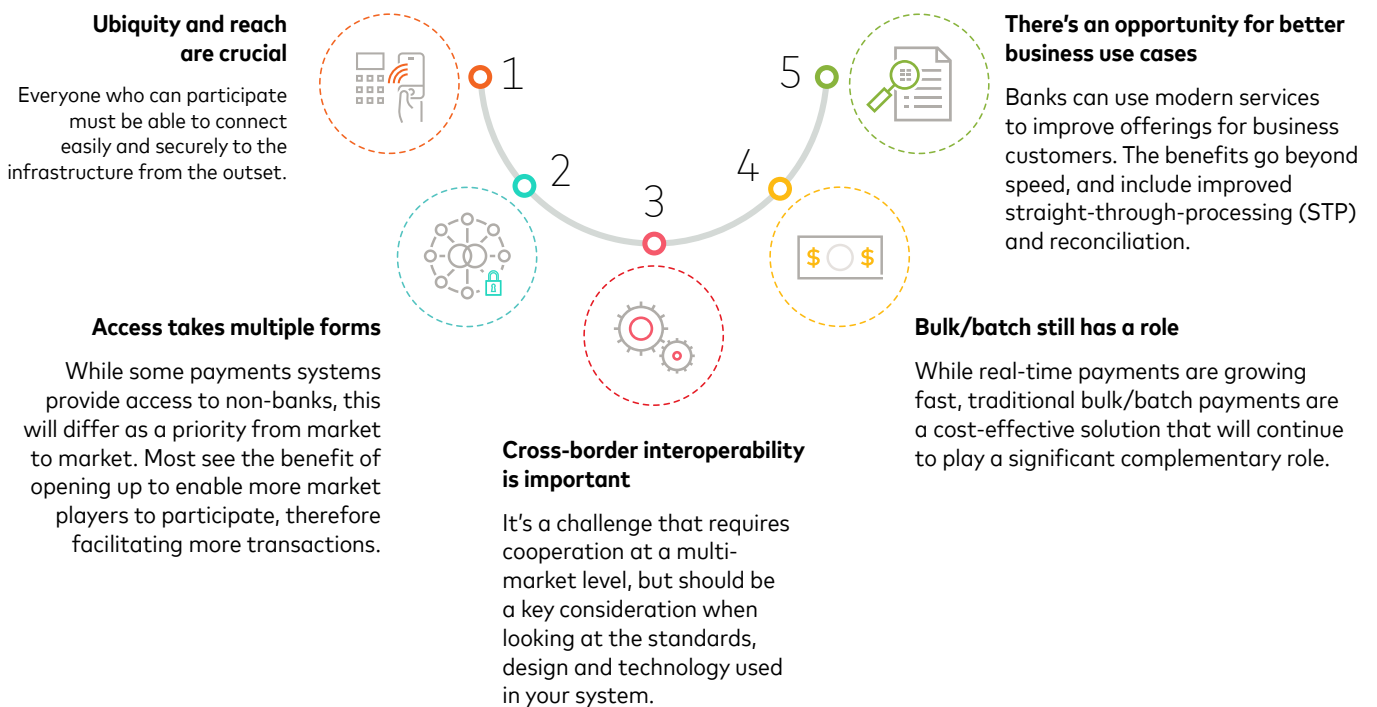
Technology is reshaping the economics of how we do business. Traditional barriers to change, such as costs and complexity, have been eroded in favor of efficient, open and scalable platforms available to all.

One of the most important advances in recent years is cloud computing. The use of cloud environments is an entirely different approach to managing payments, providing more flexibility, efficiency and scalability while potentially also providing equal levels of resiliency.

While the use of cloud technology to run payment systems may still be the exception rather than the rule, the speed with which technology is progressing makes it an increasingly practical solution. The challenge now is for regulators, banks and other stakeholders to appropriately assess these developments.

Real-time payments continue to be central to payments modernization efforts, with policy-makers recognizing them as integral to driving innovation and growth. As of Q2 2021, there were 66 markets globally with live access to real-time payments, accounting for more than 90 percent of global GDP.

Those developing real-time payments systems should carefully consider these five points:





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ISO 20022 can help hold the framework of payments modernization together. Through improved data structure, extensible messaging and the potential to interoperate between domestic and international payments systems, it addresses several pain points for banks and their end users.

While the long-term benefits are clear, industry migration will be complicated. With multiple requirements and various mandates on banks to adopt ISO 20022, managing this process strategically is vital.

Being able to transact in real-time also raises the challenge of fraud. Machine learning and behavioral analytics provide the tools to meet this challenge head on, enabling fraud to be tackled at an individual bank level. But we can also use centralized transaction data to design solutions that do so at a network or market level.

And then there's the overlays, applications and value-added services that drive and support usage. These are core to realizing the goal of a modernized national payments system.

Two of the most common and widely-adopted overlays are proxy addressing solutions (which link customer account numbers to mobile phone numbers, email addresses or national IDs) and request to pay. As an industry we also need to think more on how we use the technology at our disposal to address other areas, such as digital identity solutions, and consent and mandate management that provide additional plug-in capability.

Payments modernization is an ongoing process, and one that will continue to evolve in line with technology and changing customer demands. Whilst it may be impossible to completely futureproof your approach, the increasing standardization and flexibility of technologies deployed, if done right, should at least ensure the journey is as smooth as possible.

Choosing the right partner is as important as any design decision you face. Mastercard's global experience and capabilities in delivering payments modernization affords us unparalleled perspectives to transform insights into market-leading, future-proof, multi-rail solutions.

# Part 1: What do we mean by payments modernization?

“Different countries will take different roads, but typically they're looking for a similar outcome – an open, inclusive and innovative payments ecosystem that supports a growing range of new value-added services.”

Payments modernization is an important journey that economies around the world are either embarking on or experiencing right now.

Defining it isn't always simple. Your specific interpretation of payments modernization will largely depend on how you identify the relevant range of diverse needs, drivers and influences.

Different countries will take different roads, but typically they're looking for a similar outcome – an open, inclusive and innovative payments ecosystem that supports a growing range of new value-added services. It must also be highly secure and resilient in nature to provide peace of mind for the many participants. Some regimes may not want an open environment to the same degree, but it will still require the same strong underlying foundations.

In most cases, payments modernization is driven by public policy. For central banks, it's a call to action to improve clearing and settlement mechanisms, the types and availability of payments instruments available, legal and regulatory frameworks and market arrangements.

They may be starting out from very little, with digital financial inclusion the number one priority as they seek to move on from basic infrastructure that hinders economic development. Alternatively, a central bank may have the comparative luxury of overseeing a digitally-advanced economy, where ensuring an open and competitive environment are the main objectives.

For banks and other payments entities, payments modernization is seen through the lens of improving efficiencies, reducing costs, seizing new revenue opportunities and meeting changing customer expectations.

End users, for the most part, care little about concepts or technology ([as surveys monitoring consumer attitudes to open banking typically reveal](#)). They do, however, care when they're presented with new and innovative services that solve a particular pain point or offer them tangible benefits.

Perhaps, then, the best way to define payments modernization is as a pragmatic process rooted in a strong set of guiding principles that create a pathway to an open, inclusive and innovative payments environment which users can trust and rely on.

It's crucial you first consider the 'why?' before embarking on the journey. There's a vast range of benefits associated with payments modernization, including wider financial inclusion, better outcomes for consumer products, enhanced efficiencies in the B2B world and improved data insights. It's also important to keep in step with your neighbors in our increasingly integrated and connected world.

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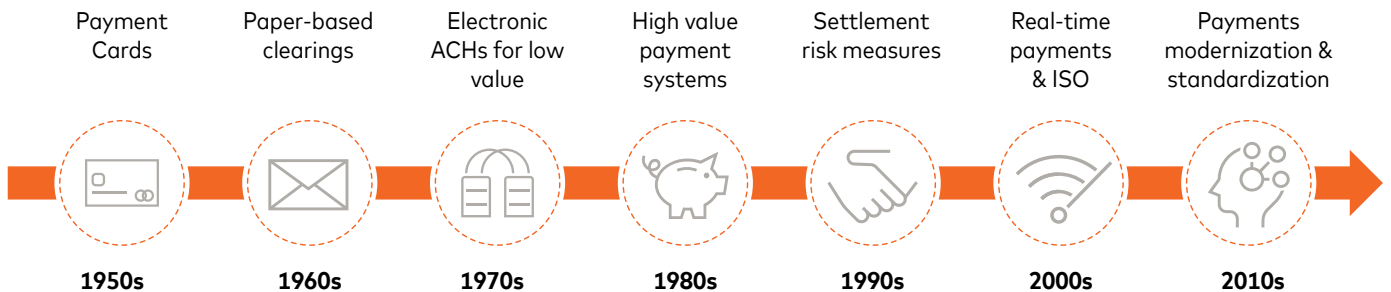
### A growing trend across the world’s markets

Historically, it’s fair to say that change has been incremental when it comes to payments systems modernization. Over the last 70 years, we can pinpoint a series of key evolutionary moments.

From the first cards in the 1950s to the latest real-time systems, payments have traditionally evolved as multiple separate systems, incrementally adding functionality. With the exception of cards, most have tended to evolve with localized specifications and standards.

The legacy of this approach means that payments systems are typically complex, operating across multiple standards and different technology stacks, creating considerable challenges for market participants to bring everything together efficiently.

This explains why policy-makers and market participants are now demanding a more integrated approach to solve these issues, with many holding the view that in order to achieve a progressive payments environment, we need modern payments systems designed towards harmonization, bringing all the different components together while still having the same, if not improved, level of availability, scalability and reliability we’ve come to expect from critical national infrastructure.



Note: These dates are a rough timeline for when these services began to take off. In reality, there was significant cross over with occasional outliers.

169%

increase of digital payments recorded between 2016 and 2020, since the launch of PromptPay<sup>1</sup>

## Different approaches to payments modernization

Not every market is in a position to adopt this kind of integrated approach. Each country has different drivers and needs, and will be at a certain stage of their own payments modernization journey.

This results in different approaches. For example, it's possible to view payments modernization as a holistic front-to-back process of updating and transforming a country's payments arrangements. However, in reality, this is quite unlikely to be the case in many situations and not reflective of the experiences that most countries go through. In some markets, a bit of tailoring around the edges or a more specific focus may be sufficient to fulfil the requirements.

Payments modernization can sometimes be seismic; a once-in-a-generation, top-to-bottom rethink aimed at ensuring future economic competitiveness. Payments Canada's ambitious roadmap, which includes a revamp of both their high value and low value payments infrastructure (as well as the country's regulatory environment), is a good example. Real-Time Rail (RTR), Canada's new real-time payments system which will provide 24x7x365 payments and will also have ISO 20022 messaging to support data-rich payments, is set to go live in 2022.

Looking south to the US, The Clearing House has launched Real-Time Payments (RTP), the country's first payments system to be developed in the digital age. It's been done outside the remit of regulation, with the market constructing a platform for opportunity. Building a new system for the first time in decades from the ground up has enabled The Clearing House to take advantage of the latest developments in cloud platforms and methods of delivering information to customers alongside a myriad of new services.

Another notable example is Thailand. Mastercard partnered with the national operator, National Interbank Transaction Management and Exchange (NITMX), to launch PromptPay, which has reduced the country's reliance on physical banking infrastructure and cash.

PromptPay comprises a real-time clearing and settlement infrastructure, which is a specific implementation of Mastercard's Instant Payment Service with an adapter that translates high-penetration ISO 8583 messages to ISO 20022, and a proxy look-up service that securely maps recipient aliases to bank account details. Since going live in January 2017, it's driven significant growth in digital payments, with an 169 percent<sup>1</sup> increase recorded between 2016 and July 2020.

1. Source: [Payment Data Indicators – Bank of Thailand website July 2020](#)

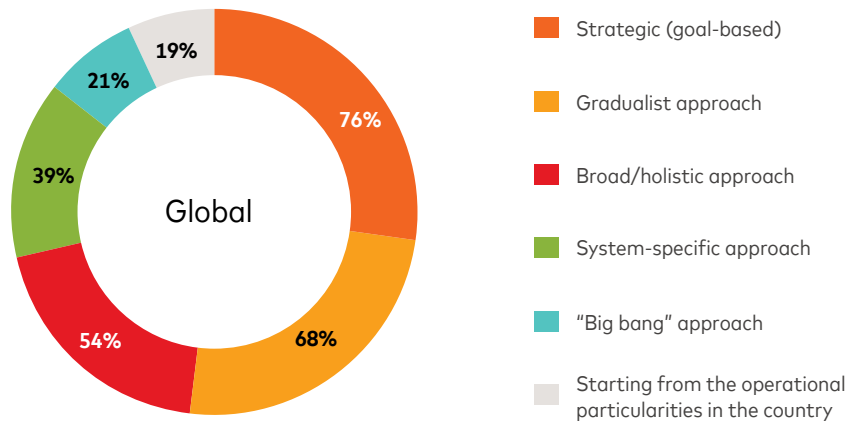


In other countries, change remains a much more incremental process. Japan's Zengin System illustrates this point. The Zengin System relays domestic credit transfers and then clears funds following the transactions. It was initially launched in 1973, and then updated to its Seventh Generation version in November 2019, following a move to 24/7 operations during the previous year.

Ultimately, there's no right or wrong; it's a case of identifying the approach that best fits your specific circumstances. Interestingly, the World Bank's Global Payment Systems Survey (GPSS), published in 2020, took a deep dive into the different approaches to payments modernization favoured around the world.

The GPSS, which looked more broadly at national payments reform, asked the world's central banks to tick all applicable options that characterized their approach.

### Payment Reform Approach



Source: World Bank GPSS 2020; Note: central banks may have selected more than one option.  
 Sample response: 99 central banks and monetary authorities

From this chart, we can make three key observations.

1. Economies overwhelmingly prefer a gradualist approach to reform (68 percent) as opposed to a "Big bang" approach (21 percent).
2. Most economies have taken a goal-driven, strategic approach to reform (76 percent), which can be measured against the 19 percent of respondents whose reform was driven by the "operational particularities of the country".
3. More evenly, 54 percent of respondents took a holistic, broad-based approach to reform compared to 39 percent that focused on a system-specific approach.

The contrasting positions identified in this research underlines the different paths that can be taken when it comes to payments modernization.

Whether you adopt the more holistic approach of Canada or the more gradualist approach of Japan's Zengin System, it's important to remember that payments modernization isn't a static, one-off moment. The tools used today to ensure an open, inclusive and innovative payments environment may need to be updated tomorrow.

Planning ahead and choosing the right technology and partners to meet current and future needs are vital components of any payments modernization roadmap.





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