



WHITE PAPER

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Central Bank Digital Currencies

How Mastercard can support central banks in their
exploration of Central Bank Digital Currencies



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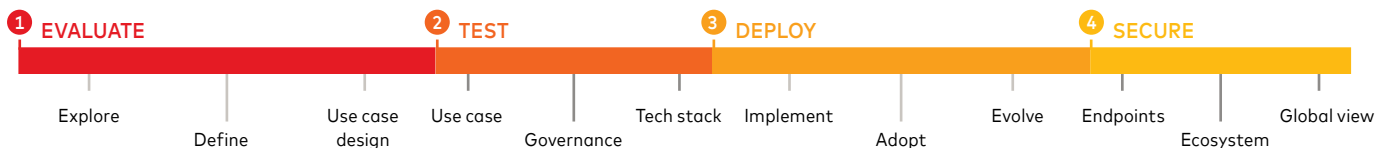
Introduction

Central banks have played a vital role in the financial system as the key source of trust underlying monetary systems around the world for hundreds of years. In response to global trends and local needs, many central banks are now evaluating the benefits and challenges associated with offering a retail central bank digital currency (CBDC) for the general public to use in day-to-day payments.¹ Indeed, 86 percent of central banks report that they are actively weighing the merits of a CBDC for their economies.²

Mastercard has been engaging in discussions with many central banks to better understand their objectives and to help them evaluate various approaches and design options. We bring to these conversations our experience running complex, interdependent global payment ecosystems operating in real time. Prompted by the impact of the COVID-19 pandemic, we've seen just how critical digital payments are to supporting the continuous operation and growth of the global economy, and how enthusiastically people and businesses have embraced them. Digital currencies increasingly show potential to become a part of everyday commerce, and we are committed to supporting the industry to realize the benefits of this potential and to support the future of payments. Innovative new solutions for sustainable and inclusive economic growth can benefit everyone, everywhere.

Central banks developing CBDCs can benefit from many of the hard-won lessons and sophisticated tools that private sector payment networks have developed for their retail payment systems over the past half-century. Mastercard is committed to helping central banks explore the opportunities CBDCs present and sees itself playing a critical role in enabling and supporting new digital networks like CBDCs from an infrastructure, applications, and services level.

To support central banks in their exploration, evaluation, and design of CBDCs, we have developed a full range of services, beginning with evaluating the case for retail CBDCs through to testing, deploying, and securing them.



In this document, we share key principles for designing effective CBDCs, as well as highlight the expertise, capabilities, and solutions that Mastercard is ready to provide central banks in support of their journey.

1. This paper focuses on general purpose or retail CBDCs offered to the public. All discussion of CBDCs in this document therefore refer to retail use.
 2. Bank for International Settlements, BIS Papers No. 114, "Ready, steady, go? – Results of the third BIS survey on central bank digital currency," January 2021.



In an **always-on world**,
money needs to keep pace

Even before the COVID-19 pandemic—and certainly since—consumers have been increasingly moving away from paying in physical cash and toward engaging in online commerce, which is accelerating rapidly. At the same time, we are seeing the continued development of blockchain-based crypto-assets that lack any central bank involvement or backing. Naturally, central banks also are looking toward the future by investigating how new technologies such as blockchain may support innovation while maintaining monetary policy and financial stability.

Why are Central Banks exploring CBDCs?

A retail CBDC has the potential to support many objectives of central banks as they consider their options for growing their economies in a sustainable manner, including:

- Further modernizing national payment systems to preserve the role of and access to central bank money amid declining cash use
- Overcoming the inefficiencies associated with the costs of printing and movement of money borne by the central bank
- Delivering new payment functionality, such as programmable and offline payment capabilities and more efficient, secure government disbursements
- Accelerating financial inclusion, particularly as cash is being used less and less
- Improving cross-border payments with an interoperable CBDC to overcome what can be slow, opaque, and expensive cross-border methods
- Speeding up the flow of bank-to-bank payments and streamlining financial market operations
- Providing a stable, secure alternative to unregulated cryptocurrencies, whose value is volatile, in order to maintain trust in the nation's monetary system

Mastercard's foundational CBDC principles

Introducing a new way to deliver money to the public will take time and careful planning. Mastercard is ready to work with central banks to maintain and strengthen trust in the payment ecosystem by championing strong anti-money laundering (AML) standards, by protecting consumers and their data, and by maintaining a level playing field for all. We are also focused on supporting the critically needed interoperability between physical cash, bank deposits, and any future digital currency.

We believe that this will be best achieved through partnerships between the public and private sectors. As a global network that supports both card and account-to-account payments, we are well-positioned to help central banks design and implement solutions that are seamlessly integrated with all existing ways to pay. We bring invaluable expertise and experience to help assess what can be best achieved building on existing and emerging private sector infrastructure. Together with institutions in the public and private sectors that seek to operate by a similar set of CBDC principles, we can shape the next generation of payments by working together on rules and standards through shared engagement with regulators and policymakers.

“Collaborations between the public and private sectors in the exploration of Central Bank Digital Currencies can help central banks better understand the range of technology possibilities and capabilities available with respect to CBDCs.”

– Sheila Warren, Head of Blockchain, Digital Assets and Data Policy, World Economic Forum

Core Principles

While the motivations driving central banks to explore CBDCs differ, there remains a common set of principles we believe all CBDC initiatives should support. These tenets will best serve the needs of consumers, preserve the health of the financial system, and ensure that consumers continue to have access to a robust and innovative array of payment options. These core principles are:



Right tool for the job: Policymakers should compare the suitability of a CBDC with other forms of new payment infrastructure—such as real-time payments (RTP) systems—in order to find the approach that best fits their unique payment needs at their current stage of development in their particular market, as well as their policy priorities for the future.



Two-tier with private sector participation: We believe the two-tier CBDC architecture under consideration by many central banks offers the best opportunity for innovation, interoperability, and sustainability. Like the retail payments network that Mastercard, financial institutions, merchants, and other stakeholders have operated successfully for decades, private sector competition ensures that the central bank retains institutional governance over core monetary infrastructure, while relying on banks and Fintech companies to compete in the distribution of the CBDC and the development of innovative user experiences and use cases.



Interoperable and open acceptance: CBDCs will be most impactful where they interoperate seamlessly across payment types and take advantage of the capacity for existing networks to facilitate broad and frictionless merchant acceptance. Interoperability between a CBDC and other forms of domestic payments, both physical and digital, as well as future systems such as digital ID networks, can both strengthen the domestic payment ecosystem and reinforce the role of central bank money.



Consumer protection: Consumers should be confident that a CBDC provides the protections needed for in-person and online transactions, and they should also understand how these protections may differ from those offered by other payment methods. To earn and maintain their trust requires a framework of standards and rules that safeguard the security of every transaction while ensuring that all parties are treated fairly and equitably.

In the following pages, we discuss the four ways in which Mastercard is ready to work with central banks and governments to support them on their chosen path to payment system modernization, including the potential development of a CBDC.



1

Evaluate: Mastercard advisory services can help central banks navigate difficult up-front decisions and imagine the future

Mastercard is ready to partner with central banks to support them in assessing CBDC appropriateness, including potential implications to their existing payment ecosystems, and to evaluate CBDC design choices and use cases, and implementing the chosen scheme. **Mastercard Advisors** can assist through three evaluation stages, outlined here:

First – Explore

How do I know if a CBDC will meet our objectives?

The first step is to evaluate CBDC suitability based on a central bank's strategic objectives, ecosystem requirements, and use cases. Mastercard can guide, frame, and inform these discussions based on stakeholder feedback, global benchmarks, and its global payment ecosystem expertise led by a panel of subject matter experts on blockchain, CBDCs, and payment ecosystems, with the aim to explore:

- User value propositions and interoperability with existing payment schemes
- CBDC design choices and technology considerations
- Use case prioritization and design

Mastercard can support central banks in evaluating a CBDC design through workshops to discuss and align strategic options and their implications. At the end of this phase, central banks will be able to articulate their target state vision for a payment ecosystem that leverages CBDCs. Suitability assessment will also evaluate the viability of an RTP solution as an alternative payment ecosystem enabler in comparison to a CBDC approach, or as a complementary payment choice to CBDCs. Real-time payments provide governments another option for fostering financial inclusion and offer safe, seamless, and secure payments to reduce the use of cash and eliminate shadow economies. RTP solutions also enable financial institutions to remain competitive in a rapidly evolving digital payments landscape.

ILLUSTRATIVE DELIVERABLES

Target state vision for a payment ecosystem that leverages a CBDC

Target state payment ecosystem assessment, highlighting key use cases that may be suitable for a CBDC

Target state payment ecosystem infrastructure design options and decisions document

Second – Define

What attributes should our CBDC have? What are the implications for our payment ecosystem? How do we create an ecosystem that benefits and protects all participants?

Next, we can help central banks develop a framework for the payment ecosystem identified as most appropriate. Mastercard can help define CBDC attributes (e.g., design structure, deployment model, policy features) and requirements, informed by stakeholder feedback, global research and case studies, and subject matter expertise. Mastercard can also support and guide critical payment ecosystem design discussions, outlining design options along with technical and security considerations.

With over 50 years managing a global network, Mastercard Orchestration Services can offer the guidance needed to implement and manage a CBDC ecosystem at scale, ensuring interoperability, consumer protection, and ecosystem integrity by providing advice and principles pertaining to:

- Governance and standards
- Customer management
- Dispute and issue management
- Ecosystem performance management

Each of these areas is considered to ensure value and protection for all ecosystem participants, including the end consumer, and to enable a design that supports interoperability.

ILLUSTRATIVE DELIVERABLES

CBDC payment scheme design framework and requirements

CBDC payment scheme design decisions

Mastercard Orchestration Services can then enable the ecosystem design by writing the standards that support the defined design. Leveraging our expertise and experience in writing the rules and requirements that govern our own payments ecosystem, Mastercard can provide a set of standards based on the central banks' needs and desires that can be leveraged with participants to ensure awareness, create trust, and enable protections among participants and between participants and the central bank as the ecosystem operator.

ILLUSTRATIVE DELIVERABLES

CBDC payment scheme standards, rules, and operating regulations

CBDC payment scheme governance structure

CBDC dispute management requirements

At the end of the Define phase, central banks will be able to articulate the design framework and requirements for a payment scheme leveraging CBDCs, including underlying options and decisions. As well, they will have access to a set of documentation they can leverage to govern their new payments ecosystem.

Third – Use case design

How would CBDCs be used in real life?

Based on stakeholder feedback and global experience, Mastercard can detail potential payment use cases and/or user stories for a CBDC. This includes an assessment of challenges, benefits, and implications for users and other stakeholders within the broader payment ecosystem. Potential CBDC use cases include the following:

- Issuance
- Distribution (e.g. consumer, business, government disbursements)
- Interoperability with existing payment schemes
- Transactions (e.g. online, in-person)
- Smart contracts
- Monitoring
- Maintenance

These use cases will then be prioritized based on assessment insights and strategic considerations. Mastercard will then prepare a plan, with success criteria for each use case, to test these in our CBDC Sandbox (see section below for more details), where transaction testing can be conducted in a controlled environment.

Equally important are the rules and governance required to run payment networks that ensure orderly transfer of value and risk-sharing among participants. Mastercard can help the central bank to define these, and our testing platform can enable them.

At the end of this phase, central banks will have a prioritized list of CBDC use cases with summaries that include business economics and a technical impact assessment, as well as a corresponding CBDC Sandbox test plan.

ILLUSTRATIVE DELIVERABLES

Prioritized CBDC use cases and user stories

Use case summaries, including business economics, and technical impact assessment for the selected use cases

Sandbox test plan with list of test scenarios for each of the selected use cases



2

Test: CBDC Sandbox can enable central banks to assess and explore national digital currencies

To support governments as they explore and evaluate the launch of their own central bank digital currencies, Mastercard has created an innovative testing environment, a CBDC Sandbox, to enable them to simulate a local payments ecosystem in a controlled environment. The CBDC Sandbox employs a modular approach that enables central banks to quickly conduct a feasibility assessment and determine the potential value to their markets—with no technology investment required.

The Sandbox is the first-of-its-kind to enable testing of comprehensive core capabilities—such as CBDC issuance, monitoring, and distribution—and to support flexible use cases, governance rules, and technology design. At the end of the test, central banks should be able to determine the development efforts a CBDC launch would entail.

Mastercard understands every central bank is unique in its exploration of CBDCs, and the platform stands ready to help central banks explore whether a CBDC fits with the needs of a region or country. The virtual platform can be individually customized to the environment in which the central bank operates, allowing them to:

- Simulate a CBDC issuance, distribution, and exchange ecosystem with banks and consumers, including how a CBDC can interface with existing payment networks and infrastructures, cards, and real-time payments rail
- Demonstrate how a CBDC can be used by a consumer to pay for goods and services
- Examine various CBDC technology designs and use cases to more quickly determine their value and feasibility in a market
- Evaluate CBDC development efforts, including the technical build, security, and early testing of the design and operations

A flexible platform to adapt to central banks' goals

Because central banks may want to test different use cases and technology designs on the platform, we provide exceptional flexibility to customize testing across three main areas:

Use case scenarios

- **Commercial use case definition:** Test use cases for P2P, P2M, G2P, and B2B scenarios
- **Interoperability:** Test use cases of CBDCs riding on other rails, such as real-time payments and cards
- **Programmability:** Explore payment conditionality use cases, such as installment payments, micropayments, e-commerce, identity, and traceability

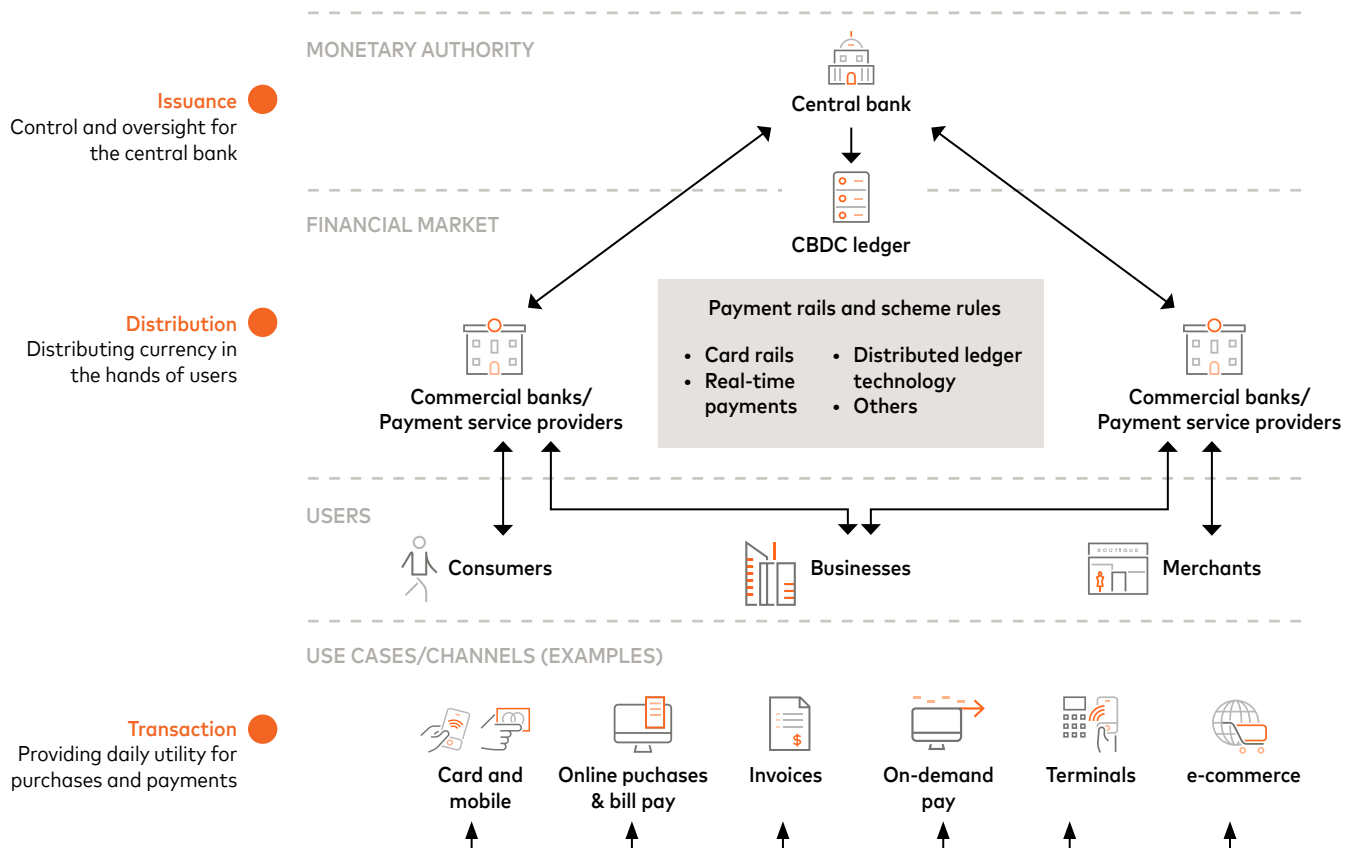
Ecosystem governance and rules

- **Governance:** Simulate multi-hierarchy governance models with various levels of centralization and distribution to test activities like issuance, exchange, acceptance
- **Rules and standards:** Support creation of schemes with rules and standards to test multiple conditions, such as exceptions or chargebacks
- **Regulatory and anti-money laundering (AML) compliance:** Simulate AML and compliance conditions

Platform technology stack

- **Account- and token-based infrastructure:** Simulate a traditional structure linked to assets held in an account or innovative token-based systems to create a "cash-like" bearer instrument that can be directly held by the individual
- **Technology stack:** The Mastercard CBDC Sandbox currently leverages our Blockchain Platform; however, other technology stacks can be enabled on the platform, such as open source blockchain protocols and centralized systems
- **Security and privacy:** Configurable levels of data privacy and anonymity, and secure infrastructure provisioning
- **Offline authentication:** Ability to simulate temporary offline capability for transaction authentication

CBDC Sandbox architecture



The advantages of the Sandbox

Our CBDC testing environment can enable a central bank to test an unlimited number of transactions, define conditions such as limits and rules it wants to validate, define use cases that involve other participants (other licensed entities, merchants, buyers, etc.), and establish scenario metrics for validating test transactions. Benefits of our end-to-end testing platform include:

- **Comprehensive:** The Sandbox can evaluate all three layers of a CBDC: issuance, distribution, and transactions, enabling central banks to thoroughly validate the value propositions and identify pain points across all financial ecosystem participants
- **Thoughtfully designed** by payments experts with global experience running payment networks and creating client-centric solutions that address relevant industry pain points
- **Quick results at low cost:** Our virtual test platform comprehensively and quickly assesses the feasibility of CBDC issuance and transactions for a specific market, without investment spend or onboarding new resources by the central bank
- **Executed by Mastercard:** Mastercard works with the central bank to identify the use case and test scenarios, set up and configure the platform, and run the test—the central bank need only provide monetary policy subject matter expertise

ILLUSTRATIVE DELIVERABLES

Feasibility assessment document, including results from use case testing and recommendations on implementation/ deployment

Testing of interoperability use cases with other payment rails, including card rails and RTP

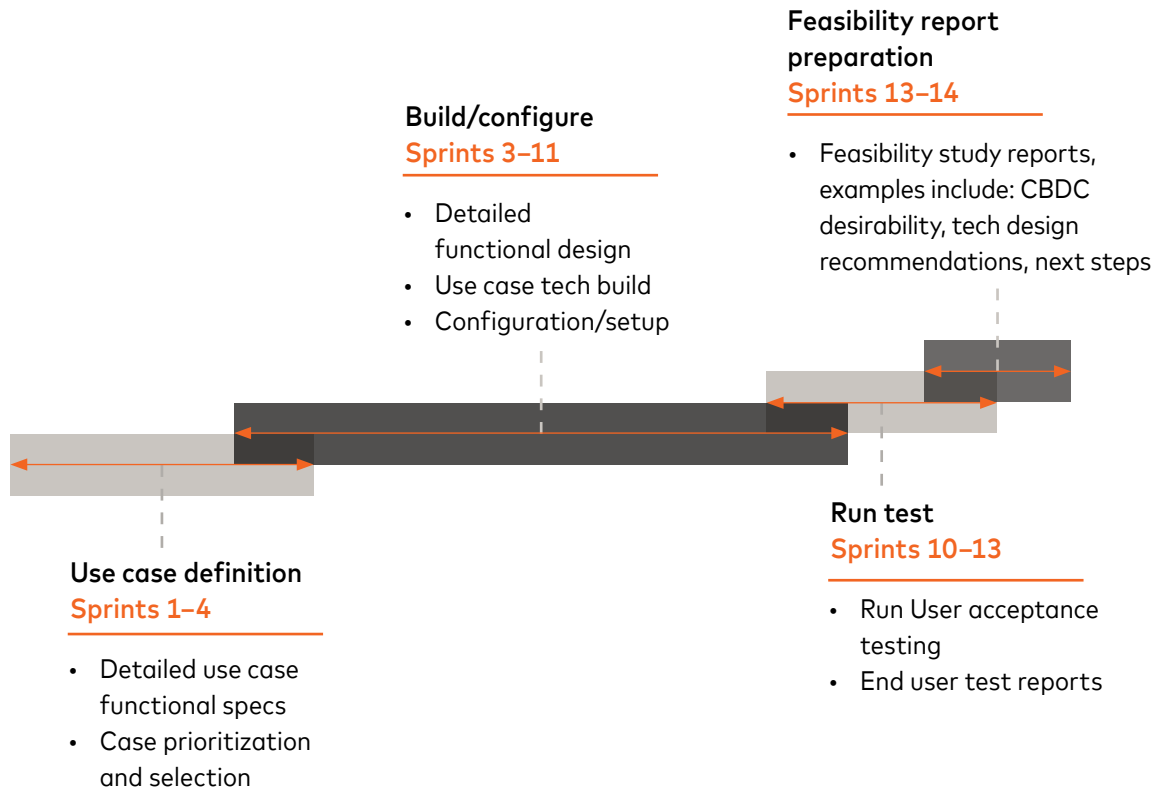
Technical assessment: technology stack recommendations

Sandbox development and testing approach

We commence solution design and delivery after agreeing on a CBDC model and use case definition, creating the business-level scope and design of the prioritized project use cases.

First, we design the overall technical solution platform architecture and configure the sandbox environment. Then we proceed to break up the project scope into a series of minimum viable products (MVPs) that can be delivered and tested in short iterations. We conclude the feasibility assessment with a comprehensive report that outlines test, results, recommendations, and next steps.

CBDC Sandbox Sample Timeline



Note: Each sprint runs for 2 weeks.

During each iteration, the following activities are conducted:

- **Scope:** We will work with stakeholders jointly identified with the client to define the detailed iteration scope via a design-thinking approach. The outcome will be the detailed functional scope of the MVP to be delivered.
- **Design:** We will then proceed with a detailed MVP solution design, focusing on the user experience, backend process and transaction flows, integration with other systems, security, and performance.
- **Build:** We will then carry out the technical build of the MVP. The preferred approach will be to keep build cycles short, and to ensure that we are proceeding in the right direction via an appropriate frequency of informal reviews.
- **Test:** Once the build is complete, we will proceed to carry out functional, security, and performance testing.
- **Review:** After testing is complete, we will conduct an MVP review with key project stakeholders, document lessons learned, make any necessary adjustments to the overall project plan, and then proceed to the next iteration.

Other considerations

- **Deployment environments:** These include various environments for development, testing, and pre-production.
- **Capacity sizing:** We assess estimated load requirements, application and infrastructure needs such as transactions per second (TPS), scaling of horizontal capacity (e.g. containerized microservice architecture), continuous monitoring, and capacity planning.
- **Security:** Conduct security reviews, security standard validations, testing, monitoring and log management, and certifications.
- **Resiliency and high availability:** Assess several factors that contribute to system resiliency, including infrastructure to ensure disaster recovery (e.g. Active-Active or Active-Standby), cloud hosting, multi-service instances, replication, and automated failure recovery.
- **Solution hosting:** We host solution infrastructure in a cloud-based environment and decommission the environment once the project is complete.
- **Platform support:** Technical and business assistance includes a dedicated project team, testers, and a test engineer. We also provide "first responder" support for technical or training-related issues resulting during the feasibility study.

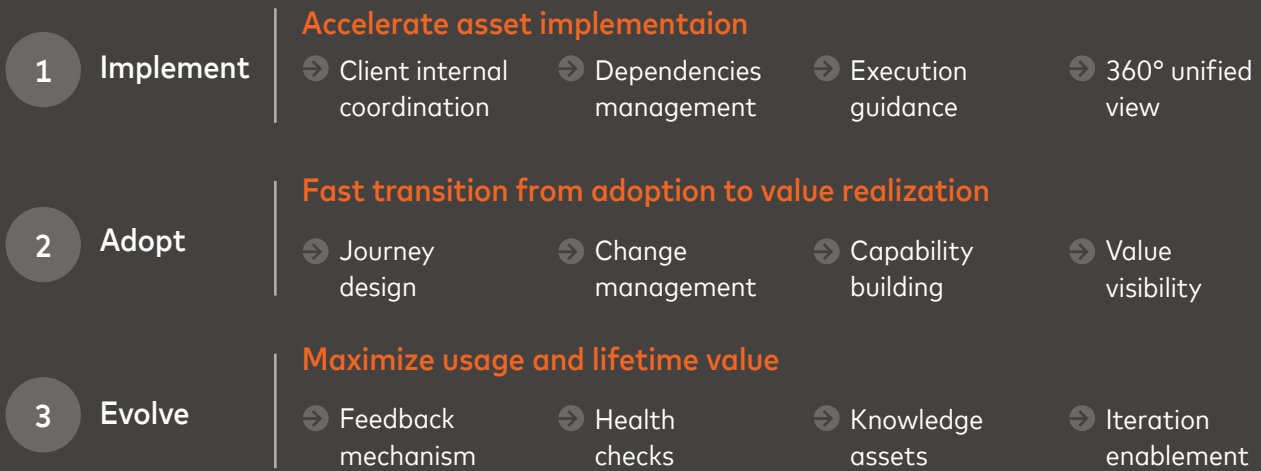


3

Deploy: Mastercard Advisors can assist to roll out the chosen CBDC

An integrated delivery approach that aims to maximize value realization

Mastercard Advisors can partner with central banks to accelerate the implementation, adoption, and ongoing governance of the chosen CBDC system. This curated end-to-end guidance and support maximizes value, streamlines the process from development to launch, and de-risks the journey by providing continuity from CBDC design to implementation. With this support, Mastercard aims to help central banks reduce their time-to-market in launching a CBDC, manage payment ecosystem engagement, and deliver the greatest value for their intended business case and best experience to end users.



1. Accelerate implementation

Whether we are working with your technology assets and resources, third-party resources, or leveraging our own developers, Mastercard can help central banks realize the vision of their digital currency. The integrated implementation team brings continuity to the design and development process and can help drive consistency throughout development. Strong project management combined with industry expertise is needed to keep stakeholders up to date, align decision-making, and keep complex projects on track. Mastercard can provide:

- A central program management office
- Internal client coordination with steering committee oversight of critical decisions and progress
- Project management across dependencies and timelines
- Development and integration assistance

2. Drive adoption

Working with development teams to align design sprints and product release timeframes, Mastercard can help ensure that features are rolled out in a thoughtful and strategic way to help drive adoption and engagement. As CBDC development reaches an MVP, Mastercard can help central banks plan and strategize the launch, including:

- Partner development with commercial banks in the region
- Coordination across existing payment ecosystem players
- Ensure interoperability across payment types to facilitate broad and frictionless merchant acceptance
- Provide Identity, Security, and Fraud solutions supporting the safety and security of the CBDC network while reinforcing consumer confidence

Mastercard's expertise in payments ecosystems can help ensure the most efficient path to value realization. The launch and adoption phase will provide central banks with:

- Thoughtful journey design from development to feature release and MVP launch
- Change management and coordination among payment ecosystem participants
- Partner development with commercial banks for CBDC distribution
- Adoption and usage measurement and visibility

3. Continuous evolution and improvement

As the MVP for a CBDC is adopted and usage is observed, Mastercard can help drive continuous improvement and development to maintain engagement and build new capabilities. Ongoing evolution of the CBDC solution can help ensure new features or enhancements are responsive to and prioritized in line with feedback from payment ecosystem participants. Evolution and ongoing governance of the CBDC solution will provide:

- Proven test and learn methodology to provide quantitative insights into the usage and performance of the CBDC
- Steering committee to review adoption and usage and to assess alignment with business case
- Regular health checks to assess successful adoption and engagement from payment ecosystem participants
- Continuous improvement with feature prioritization and a development roadmap to build new capabilities and drive ongoing usage and engagement



4

Secure: Mastercard Cyber & Intelligence Solutions can provide protections against cyber criminals

\$10.5 trillion

Cybercrime is expected to reach \$10.5 trillion annually by 2025³

CBDCs have the potential to bring even greater convenience and speed to our financial system

The cost to the global economy of cybercrime is expected to grow by 15 percent per year over the next five years, reaching \$10.5 trillion USD annually by 2025. A retail CBDC will inevitably face the risk of suffering sophisticated cyberattacks from both private and state-sponsored actors. CBDC users must trust that the system will be accessible and operational where and when it is needed; that their funds, accounts, identity, and other data are secure; and that they will be protected in the event of fraud. There are many methods and strategies that can be used to secure a payments ecosystem. Mastercard has experience with securing complex interdependent global payments ecosystems and can work with central banks to extend existing solutions to CBDCs.

A first challenge: infinite endpoints

Retail payment systems have significantly more endpoints than the wholesale payment systems with which most central banks are more familiar. And while innovations like the Internet of Things (IoT), 5G mobile networks, and CBDCs have the potential to bring even greater convenience and speed to our financial system, each point of interaction also represents another opening for vulnerabilities. It is no surprise that the explosion of digital channels has resulted in increased fraud and financial crime.

One of the many tools we use to secure the Mastercard Network is RiskRecon. This service helps organizations—including issuers, acquirers, and merchants—proactively monitor, detect, and act on security and cyber risks across their digital supply chain.

Tools like RiskRecon could help members of a CBDC ecosystem determine whether their vendors and service providers introduce threats and vulnerabilities into their security posture, and what actions they should take to reduce these risks. For example, it could help financial institutions and merchants pinpoint and prioritize cyber risk by:

- Assigning a cyber risk rating for every third-party service provider and vendor based on the assessment of their cyber environment, using machine learning algorithms and verifiable data collected from public domains
- Benchmarking third-party service providers and vendors against standardized compliance frameworks and among one another
- Sending alerts when risk thresholds are triggered, recommending actions to reduce third-party risks, and providing risk plans that can easily be shared with vendors

Central banks that collaborate with the private sector to monitor every endpoint in their CBDC's ecosystem—identifying cyber-vulnerabilities before they become an issue—will be best positioned to deliver a retail payment experience that meets their citizens' expectations for trust and security.

3. Cybersecurity Ventures, 2021 Report: Cyberwarfare In The C-Suite, January 21, 2021.

CBDC ecosystem will likely be responsible for conducting their own Know Your Customer (KYC) and AML activities

A second challenge: viewing risk across the ecosystem

While supervised intermediaries in a two-tier retail CBDC ecosystem will likely be responsible for conducting their own Know Your Customer (KYC) and AML activities, their inability to track transactions beyond their perimeter leaves them vulnerable to financial criminals—who have developed tools that exploit such limitations. To avoid inadvertently facilitating financial crime, central banks that issue CBDCs must do more than set stringent KYC and AML standards for supervised intermediaries; they must also provide a network-level view that empowers all intermediaries to more effectively identify and trace financial crime as it moves across the ecosystem.

Mastercard offers Trace Financial Crime, an award-winning solution, to financial institutions to provide them with a network-view that helps them to trace the flow of illegal funds on a greater scale—with more speed and accuracy than ever before. Using this tool can support the identification of criminal networks, the repatriation of stolen funds, and create a step change in the fight against organized crime and terrorism. Mastercard would be delighted to share operational and technical lessons learned from the development of our Trace Financial Crime solution, and to explore opportunities to collaborate with central banks on building a similar set of capabilities for a planned CBDC.

The safest organizations will be those that travel together—sharing critical insights in real-time from a network that is global in scope

A third challenge: having a global view of the threat-landscape

While many financial service providers and institutions may think they have the tools and policies to prevent cyberattacks, fraudsters are proving to be exceedingly sophisticated—often covertly disabling the internal monitoring systems of their targets before launching highly coordinated attacks. These modern cybercriminals exploit both organizational silos and national borders to undermine the safety and security of critical systems. The result is a world where no organization pursuing a strategy of cybersecurity “self-reliance,” regardless of their sophistication, can be confident that their systems are secure. The safest organizations will be those that “travel together”—sharing critical insights in real-time from a network that is global in scope.

To most effectively secure a retail CBDC from both foreign and domestic threats, central banks will need to deploy ecosystem-level monitoring tools that are global in scope; relying on partners to provide critical intelligence from beyond their own borders.

To address this challenge within our own network, Mastercard developed Safety Net. Using automated and supervised artificial intelligence (AI), Safety Net responds more quickly than human-dependent processes, providing members of our ecosystem with a secondary layer of defense that is independent from their internal systems and informed by cyber-risk signals from around the globe. With real-time visibility into large-scale global fraud events, Safety Net limits the exposure and impact of these attacks on financial institutions in our network, while helping to minimize their financial and reputational impact to the ecosystem.

Central banks have a vested interest in providing supervised intermediaries in the CBDC scheme with a second line of defense that complements the individual institutions' day-to-day fraud safeguards. It is for just this reason that Mastercard has been providing central banks, governments, and domestic payments switches with the ability to connect to the Safety Net system since 2019. This service enables central bank networks to monitor fraud for any market around the world—providing unparalleled visibility into global fraud trends. These insights, combined with machine-learning monitoring tools, allow central banks to screen their ecosystem participants for suspicious transactions that may indicate compromised security systems.

Conclusion

Mastercard is committed to building a digital economy that works for everyone, everywhere.

Forging new paths for sustainable and inclusive economic growth improves the quality of life and the financial security of all segments of society. Maintaining public trust will be a critical element to successful transformation.

More than 50 years of expertise running retail payment infrastructure around the world has provided Mastercard with deep insights into the most effective methods to deploy safe, resilient, and sustainable payment networks. We continue to invest in innovative approaches to payment infrastructure and services—including the use of blockchain—and we are eager to leverage that expertise to support the evaluation, testing, deployment, and security of new payment infrastructures around the world.

Finally, we believe in the efficacy of partnerships between the public and private sectors to successfully usher in transformational change, drive adoption, and create the best end-user experience. Ongoing payments innovation, expanded financial inclusion, and the efficiency of national and international payment flows all depend on vibrant private sector competition. If a CBDC is the right path for a central bank to reach its objectives, the private sector can assist in many areas, including the design and distribution of the CBDC.

We are ready to engage in a deeper discussion and explore how we might help central banks bring their vision to life and realize their goals.

Mastercard has experts in a variety of areas to support CBDCs

Mastercard Advisors, the professional services arm of Mastercard, provides payments-focused consulting services (including business strategy, proposition and operating model design, performance optimization, marketing, information and risk management) to financial institutions and merchants worldwide. We combine traditional management consulting with our rich data assets and proprietary technology to provide our clients with powerful strategic insights and recommendations. Our team can then translate insights into execution by implementing and deploying critical business applications to help our clients realize their strategies.

Mastercard Franchise applies our 50+ years of experience as an ecosystem organizer to nurture and grow other multi-sided platform businesses. Our Orchestration Services are comprised of four main practice areas: value creation for participants, participant management, overall ecosystem management, and effective governance. We work with clients to create meaningful value exchanges, ensure trust and security, protect the integrity of interactions, standardize interoperability, enable consistent and ubiquitous experiences while enabling effective monetization for participants.

Mastercard Products & Engineering explores new technology and trends with a customer-centric mindset to develop and deliver the best experiences with the highest levels of safety and security. These organizations include Commercial and B2B solutions, Digital Consumer Solutions, and New Payment Platforms.

Cyber & Intelligence Solutions at Mastercard is responsible for safeguarding trust in payments, both now and in future. We ensure that transactions and interactions are safe, simple, and smart. By cyber we mean cyberspace in its truest sense—the totality of the digital world we operate in, both online and offline. Intelligence refers to the use of smart technology and deployment of services—artificial intelligence (AI), machine learning, and the sophisticated interpretation of data—to better protect and serve customers. We help Mastercard develop solutions in fields beyond payments as our remit expands from transactions to interactions.



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