SLK

WHITEPAPER

Key considerations for banks to prepare for the CBDC era

www.slksoftware.com

Contents

Introduction

The payments space has become a hotbed of innovation with the global Banking industry embracing cutting-edge digital technologies enabled by AI automation. Central Bank Digital Currency (CBDC) adoption lies at the heart of this new paradigm shift.

What's the hype about CBDCs?

CBDCs are digital currencies issued by central banks of nations that are a digital representation of the official currency. The advantages of an advanced digital technology stack like the blockchain, crypto, etc., and the safety and flexibility of a CBDC make its adoption imperative in a world rapidly moving towards Web 3.0 adoption.

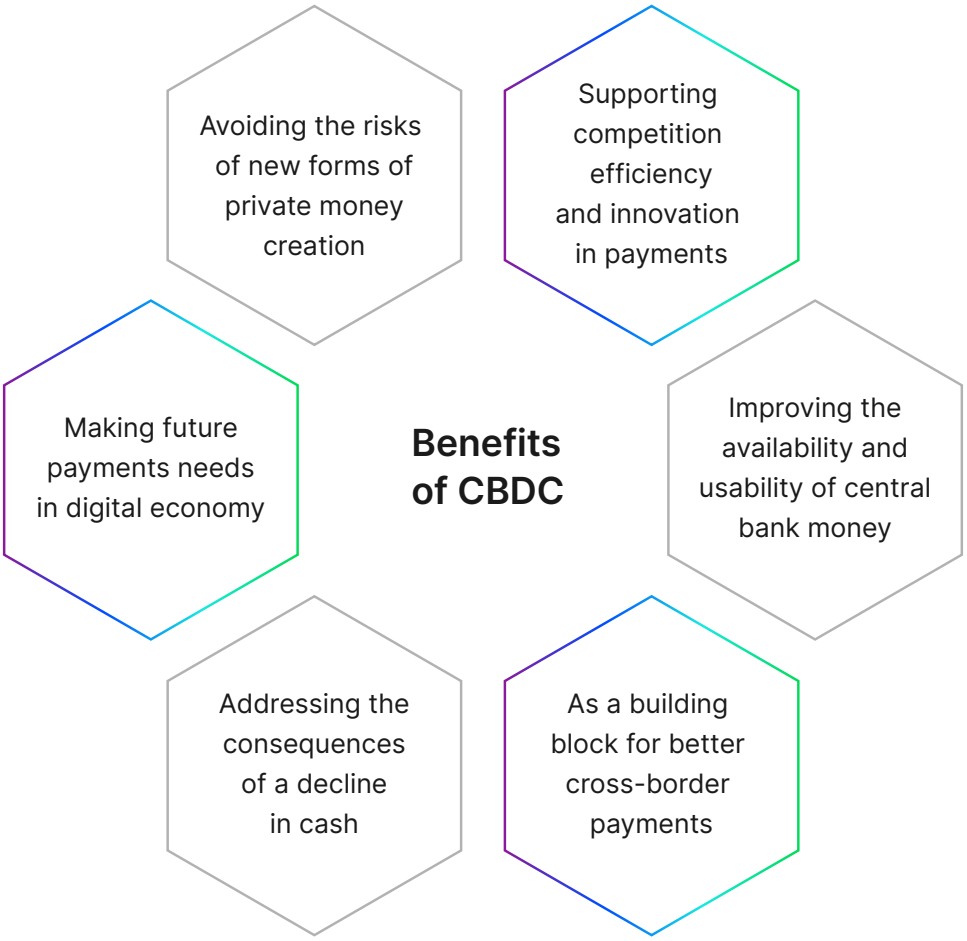

Fig 1: Benefits of CBDCs

Interest in CBDCs is driven by their potential to support several central bank objectives as they consider their options for growing their economies sustainably **(See Fig 1).** For instance, with CBDCs, central banks can further modernize national payment systems to support digital economies, deliver new payment functionalities, and overcome risks and inefficiencies in printing and moving physical money. In addition, CBDCs can accelerate financial inclusion, improve cross-border payments, accelerate the flow of bank-to-bank payments, and streamline financial market operations.

A quick look at how CBDC adoption is shaping up globally

In May 2020, only 35 countries were considering CBDCs. The COVID crisis accelerated the need for digital options and the urgency to adopt CBDCs. The interest peaked in March 2023 as 114 countries representing over 95% of the global GDP are committed to CBDC projects.[1]

However, early movers like Singapore initiated Project Ubin as early as 2016, focusing on implementing Distributed Ledger Technology (DLT) and Blockchain technology to domestic payments.[2]

A snapshot of CBDC across the Globe

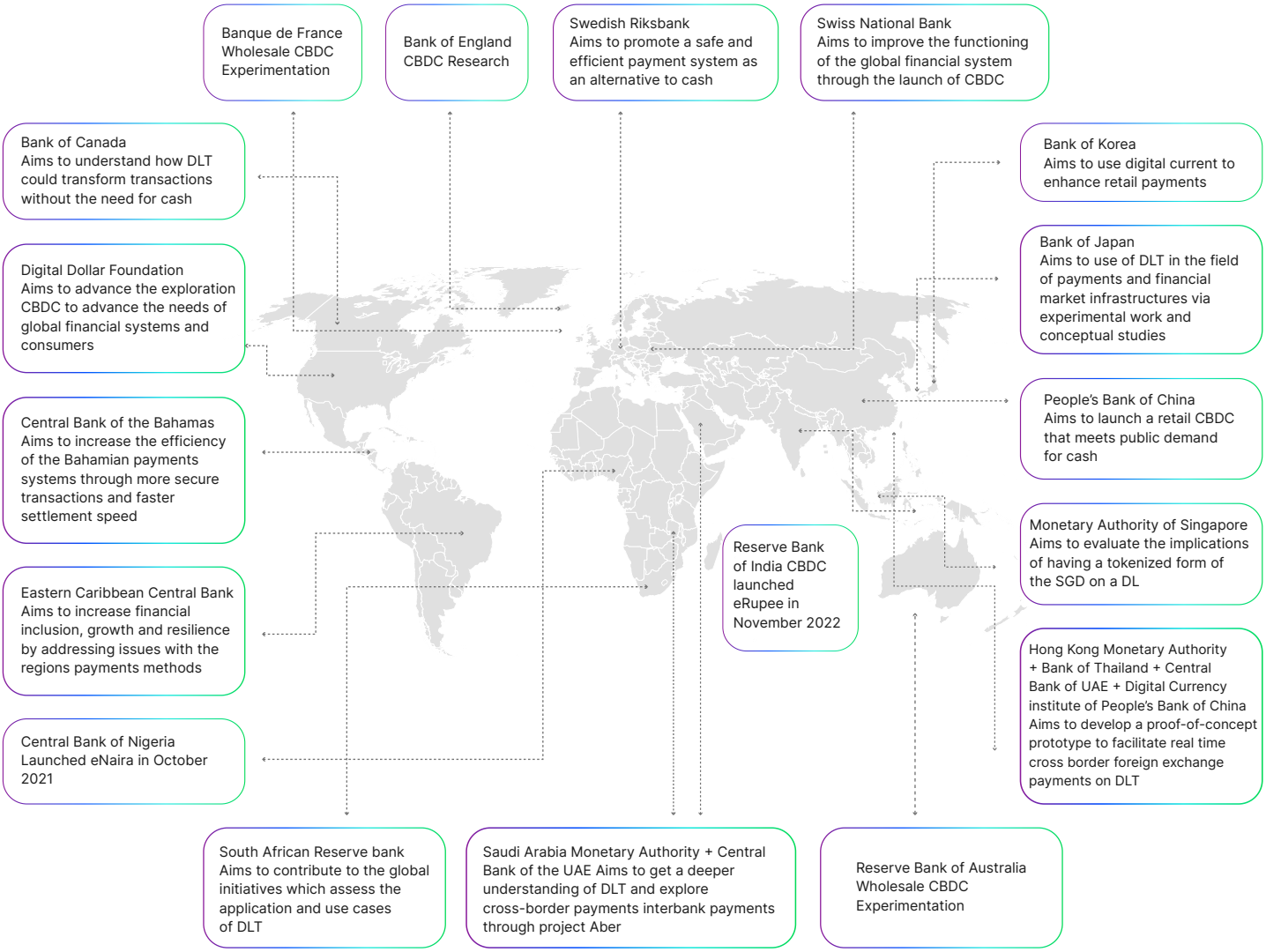

Fig 2: CBDC adoption globally

Cambodia launched CBDC named Bakong, which is currently adopted by 18 financial institutions and runs on Cambodia's legacy payment solution. It onboarded 5.9 million users in its first year and has conducted around 1.4 million transactions with a total value of USD 500 million. The Indian central bank, RBI, also launched the Digital Rupee for the wholesale segment in Nov 2022 to settle secondary market transactions in government securities.

Central Banks in Australia, Singapore, Malaysia, and South Africa, along with the Bank of International Settlement's Innovation Hub, are conducting trials for cross-border payments through CBDCs to assess if transactions can be settled cheaply and quickly. The USA has launched the DDP - Digital Dollar Project (See Box) - to encourage research and debate around the potential challenges and use case possibilities of a US CBDC.[3]

Several retail CBDC projects are live or tested in a live pilot environment before their formal launch. The speed of research, testing, and implementation is set to intensify in 2023. This is particularly the case in developing countries where financial inclusion is often one of the key expected outcomes for a retail CBDC.

A glimpse into the Digital Dollar Project

Federal regulators in the United States have not reached any consensus on whether to launch a Digital Dollar in the country. Still, agencies and those in the private sector have been exploring the possibility.

The Digital Dollar will be a tokenized form of the US dollar and operate alongside existing fiat currency and commercial bank money. It will mirror many properties of physical money, including its ability to work alongside existing account-based systems. The Digital Dollar will be distributed through the existing two-tiered architecture of commercial banks and regulated intermediaries. The key considerations in the DDP will be privacy, flexibility to adapt configurability, and neutrality to monetary policy.

Adopting CBDCs will be a big change and comes with some challenges making many banks skeptical about the development. Banks still lack consensus, and the changes affecting the US central bank's financial infrastructure have yet to be worked out completely. For instance, security and privacy concerns still linger as the process must be 100% online, and offshore accounts may need additional safety checks. In addition, many countries do not have the infrastructure to support advanced technologies that might form the base of the Digital Dollar.

All eyes are on the DDP to understand how it will affect the US central bank's financial architecture – given that the US dollar is also the reserve currency for global trade and foreign exchange deposits.

Possible CBDC Distribution Models

CBDC transactions would need to be final and completed in real-time, allowing users to make payments to one another using a risk-free asset. For example, individuals, businesses, and governments could potentially use a CBDC to make basic purchases of goods and services or pay bills, and governments could use a CBDC to collect taxes or make benefit payments directly to citizens. Additionally, a CBDC could potentially be programmed to, for example, deliver payments at certain times.

To enable CBDCs for their economies, central banks can choose between the following:

- Token-based or account-based CBDCs
- Retail-based or wholesale-based CBDCs

Token-based vs. account-based

Token-based CBDCs

For these CBDCs, the distribution will involve the transfer of an object of value between the wallets of concerned parties. The transaction is approved by the sender and receiver-related public-private interactions and their digital signatures. It provides a high level of privacy but adds layers of difficulty in dealing with money laundering and fraudulent matters. Further, parties face issues if credentials to wallets are lost or compromised.

Fig 3: Token-based CBDCs

Account-based CBDCs

In this case, the distribution will involve transfer between relevant accounts only through secure interfaces. A transaction is approved between parties based on the verification of their respective user identities. The Central Banks would regulate the digital account services for every party.

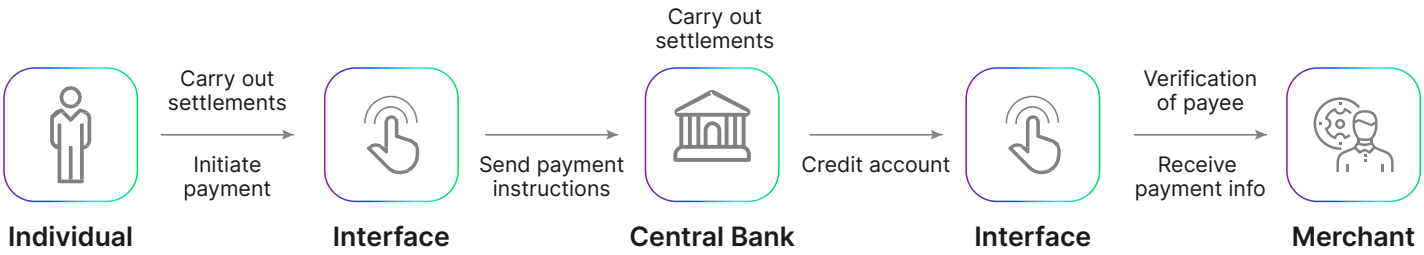

Fig 4: Account-based CBDCs

Retail-based vs. wholesale-based

Retail-based CBDC

Here, the focus is on the issue of CBDC to regular households to promote better financial inclusion, create a cashless economy, and minimize costs related to cash printing and management. There are two types of retail CBDC-indirect and direct.

A. In Indirect Retail CBDC, the financial institution that provides financial services to the individual or business issues the digital currency directly and sends and manages payment services to other financial institutions and the Central Bank.

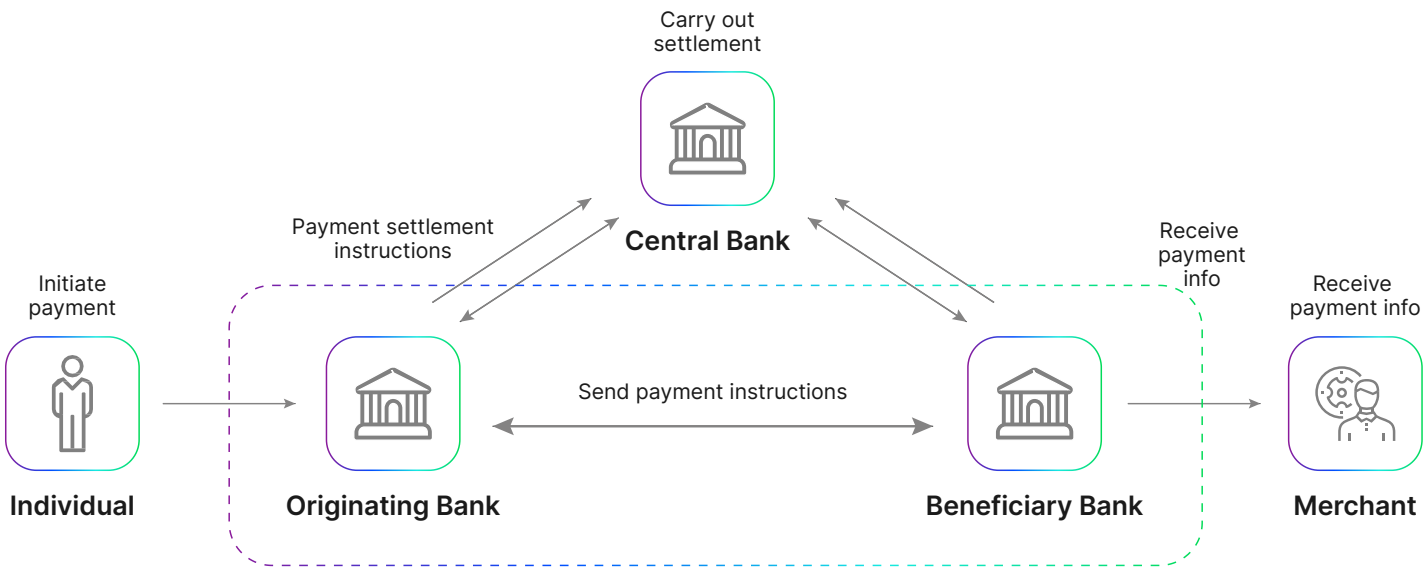

Fig 5: Indirect retail CBDCs

B. In Direct Retail CBDC, individuals and businesses hold digital currencies in private accounts at the Central Bank without the need for intermediaries. This might place a huge workload on the Central Bank that may affect its regulatory nature and add a marked increase in the burden of managing its roles and responsibilities.

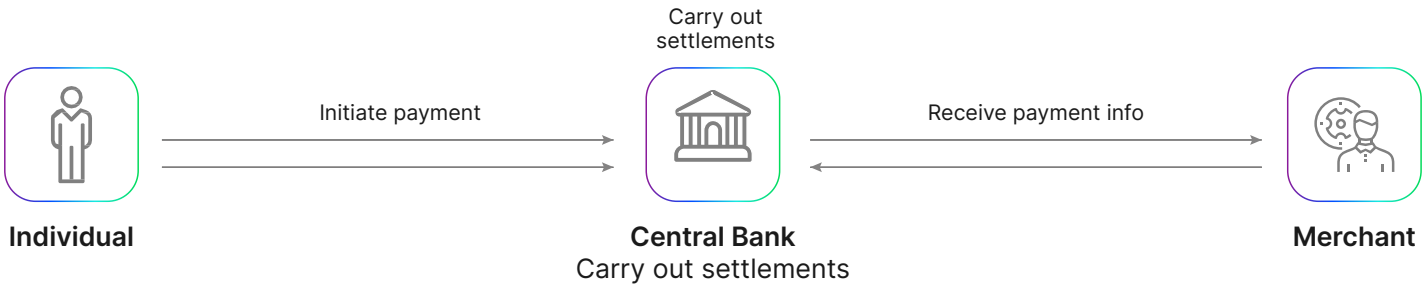

Fig 6: Direct retail CBDCs

Wholesale-based CBDC transactions

These are executed for high-value interbank transactions between financial institutions. Most of these are cross-border settlements, with the goal of improving settlement efficiency and security and minimizing risk.

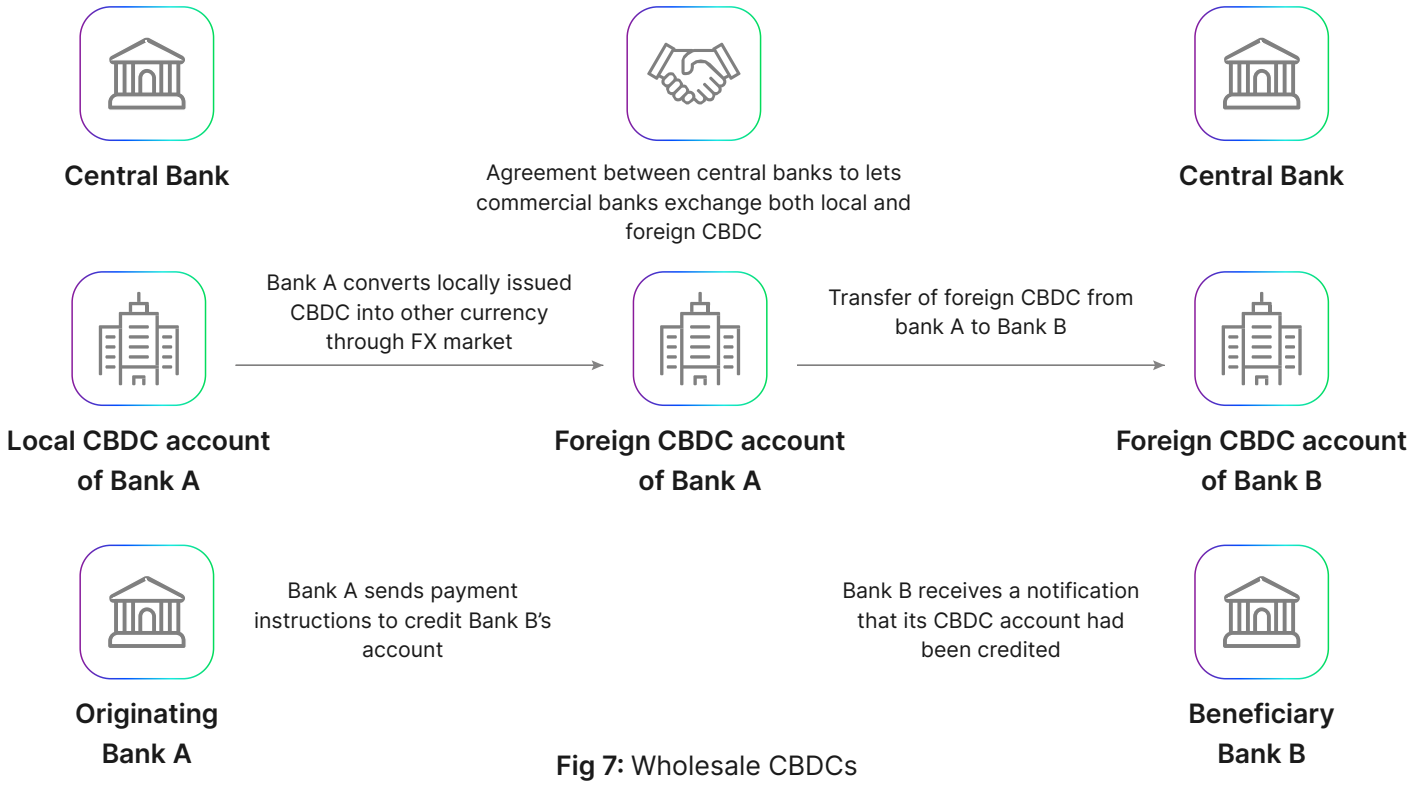

Fig 7: Wholesale CBDCs

Building for success with an open, interoperable, provider-based system

While there are many use cases and benefits of CBDCs, many challenges and risks will need to be addressed before they can be introduced. Central banks also need to make several key design decisions, some of which will have far-reaching consequences in terms of how the CBDC is used and its potential impact.

Central banks should issue CBDC on a large-scale, private, permissioned, Ethereum-based network in which central bank-appointed intermediaries act as nodes. These intermediaries would work together on a single platform as providers of the currency, as well as compete to offer innovative services to citizens and businesses. The number and type of intermediary service providers would be much larger and broader than is the case with central bank money today, incorporating financial and non-financial institutions, but the system would not entail the direct distribution of CBDC to the public.

The success of the system will depend on several factors (See Fig 8 and 9), including the following:

- The central bank is the only entity allowed to issue CBDC units and remove them from circulation.
- Quasi-real-time asset transfer at negligible cost – Rapid transactions with transfers occurring at or near real-time and at a sub-one-tenth of a cent cost.
- High transaction throughput with several thousand to several tens of thousands of transactions per second on the network.
- Support for several hundred to several tens of thousands of approved intermediaries as network participants
- Privacy of consumer data and transactions - central banks should not have a comprehensive view of individual wallets and associated IDs below a certain transaction value threshold when KYC/AML requirements would kick in

	Instrument Layer		Payment Service Layer		Infrastructure Layer	
Stakeholders	Households	Businesses	CBDC Distributor/ Operator	Payment Interface Providers	Central Bank	
CBDC Desirable Features	Convenient	Cost efficient	Interoperable with other payment systems	Promote fair competition	Safe and trusted means of payment to the public	Offer settlement finality
	Convertible	Easy accessible	Appropriate incentives structure and business model	Open for innovative and business-viable use cases	Resilient system with high availability	Minimize financial stability risk
	Safe & Secure	Programmable	Cost-efficient to participate	Access to payment data	Process large volumes and values of retail transactions in real-time	Minimize financial stability risk
	Interest-bearing				Manage data security and privacy	Control money supply and transmit monetary policy more effectively

Fig 8: Technical Schema[4]

	Key Attributes	System Architecture	Governance, Standards & Regulations
CBDC Design Considerations	Anonymity: Full/Limited/No anonymity	Issuance: Token-based/Account-based/Hybrid	Participant roles & responsibilities
	Interest: Interest-bearing/Tiered-Interest/ No interest/ Only Negative Interest	Distribution: One-tier/Two-tier/Hybrid	Standards & regulations
	Accessibility: Open Source/Limited	Transfer & Settlement: Centralized/Decentralized/Hybrid	Compliance & Risk Management
	Transfer cost: Free/ Fee on certain transaction amounts		
	Holding, Transfer & Conversion: Unlimited/Limited		

Fig 9: CBDC design considerations[5]

How can banks support and prepare for the CBDC wave

As central banks across the globe contemplate CBDCs, other banks need to be ready for changes to their business brought about by this development. These include impact to:

Business models
The rollout of a CBDC would generate large amounts of transaction data that can open opportunities for analysis and new real-time economic insights. This would help banks innovate current products and services across portfolios to leverage and adjust to CBDC opportunities and behaviors.

Regulatory compliance and reporting
Existing compliance and legal frameworks may be reformed based on CBDC design in addition to different accounting rules and audit and financial reporting requirements.

Technology infrastructure
Banks may need to adapt their infrastructure to process CBDC transactions; enhance digital apps to introduce CBDC functionality, leverage existing processes; evolve customer interfaces; and enable open, compatible infrastructure or hardware. For cross-border, FX transactions, or multicurrency wallets, banks may also need to manage designs unique to individual CBDCs.

Risk management
Create real-time infrastructure for identity and access management and double down on cybersecurity threats and vulnerabilities.

Talent
Reskilling and capacity building of bank staff to manage CBDC transactions, related technologies, and regulation adherence effectively.

While not all banks may participate in CBDCs right out of the gate, those catering to digitally savvy customers would want to be prepared. This means staying on top of CBDC developments across the globe (a mammoth task given 110 countries to watch!), updating technology, and begin considering the creation of CBDC-compatible digital wallets.

Taking the next steps to capitalize on this opportunity

The emergence of CBDCs is a game-changing opportunity for all stakeholders. Central banks, banks, other financial intermediaries, and regulators need to start thinking about and building a base for the future where CBDCs are the norm.

Central banks should increase considerations for pilots and partial adoption to deploy CBDCs in more production-like settings. This would help them understand the conditions that must be met to successfully introduce CBDC, including possible regulatory and legislative adjustments where needed.

Leading central banks should advance towards establishing more permanent platforms or test larger environments to introduce CBDCs for the financial sector. It will allow them to explore better use case scenarios and gradually build the needed infrastructures to reach a production-ready deployment.

Banks and other financial intermediaries will need to launch more products compatible with future CBDC technology and take measures to build capabilities to be relevant in the new order.
Financial market infrastructure providers, including central securities deposits, will likely embrace emerging CBDC use cases, and the effect will trickle down to intermediaries and users. Financial Services Providers should understand the commercial opportunities associated with CBDCs and stablecoins, anticipate risks today, and implement initial strategies and feasible use cases with digital assets.

Regulators should define common regulations for digital assets and build on what already exists in advanced countries. They should emphasize setting new standards on data privacy, financial security, and environmental footprints.

CBDCs are set to come at scale. Many business models may not be feasible using existing systems but would be by leveraging new technologies offering alternative use cases, more direct financial relations, and more efficient services throughout the asset and financial product life cycle. CBDC adoption will fulfill that promise and create increased efficiency and newer use cases.

To know more about the impact of CBDCs on your business, write to us at hello@slkgroup.com

References

[1] https://www.atlanticcouncil.org/cbdctracker/

[2] https://www.mas.gov.sg/schemes-and-initiatives/Project-Ubin

[3] https://www.prnewswire.com/news-releases/the-digital-dollar-project-publishes-updated-white-paper-furthering-exploration-of-a-us-cbdc-301724360.html

[4] https://www.bot.or.th/Thai/digitalcurrency/documents/bot_retailcbdcpaper.pdf

[5] https://www.bot.or.th/Thai/digitalcurrency/documents/bot_retailcbdcpaper.pdf

About Us

SLK is a global technology services provider focused on bringing AI, intelligent automation, and analytics together to create leading-edge technology solutions for our customers through a culture of partnership, led by an evolutionary mindset. For over 20 years, we've helped organizations across diverse industries - insurance providers, financial service organizations, investment management companies, and manufacturers - reimagine their business and solve their present and future needs. Being A Great Place To Work Certified, we encourage an approach of constructively challenging the status quo in all that we do to enable peak business performance for our customers and for ourselves, through disruptive technologies, applied innovation, and purposeful automation. Find out how we help leading organizations reimagine their business at https://www.slksoftware.com/