VISA

Digital Currency

in Asia Pacific

April 2021

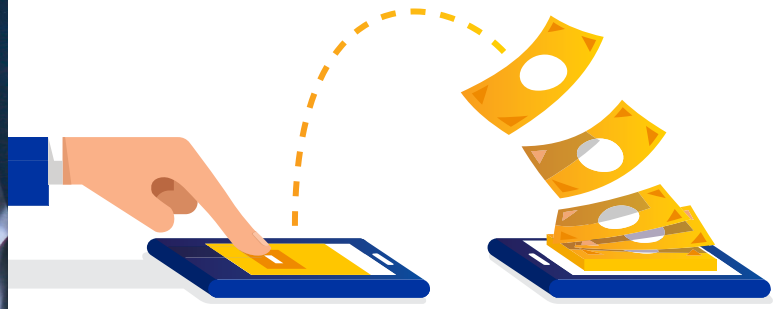
Introduction

"What if money became fully electronic?"

Sixty years ago, a simple yet bold question led to the founding of Visa as we know today. Millions across the world are familiar with the Visa brand – we pay for our meals by tapping our phones, purchase groceries with a click, and send money seamlessly and securely across borders and time zones.

There have never been more ways to pay and be paid digitally. Yet US$6 trillion in cash and cheques changes hands annually in Asia Pacific[1]. The friction, opacity, and inefficiency of paper money could soon be displaced with the introduction of digital currency – or 'digital versions of cash'.

By examining digital currency, with particular focus on central bank digital currency (CBDC) in Asia Pacific, we aim to better understand the impact it can have on the broader payments ecosystem.



While the concept of digital currency was introduced a decade ago, recent developments have accelerated its development, such as the emergence of fiat-backed digital currencies known as 'stablecoins', and growing interest from a number of central banks to introduce a sovereign digital currency.

As a global payments technology company, Visa is focused on delivering the greatest value to consumers, businesses and economies everywhere, regardless of currency, channel or form factor.

Given the potential of digital currencies to extend the value of digital payments to a greater number of people and places, we want to help shape and support the role it plays in the future of money.

In this paper, we share Visa's vision of digital currency in Asia Pacific and how we are uniquely positioned to help make them more safe, useful and applicable for payments.

1 Visa Investor Day 2020: Central Bank data; Oxford Economics; Euromonitor Merchant Segment Study 2018; Visa Operating Certificates.

Digitisation of money

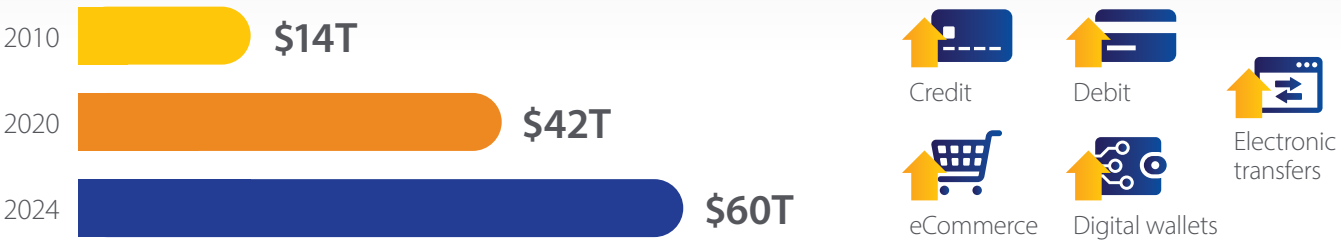
While it may take years before we fully understand the impact of the coronavirus, one thing is certain: it has accelerated the shift towards digital-first experiences, particularly in the way commerce takes place.

In 2020, eCommerce transactions surged as more people stayed home. Contactless payments increased as more shoppers sought ways to pay without touching a payment terminal. More businesses adopted innovations such as virtual payment cards to pay suppliers.

Three quarters of people surveyed in Asia Pacific will continue using digital payments, even after the pandemic has subsided[2]. **The digital economy is here to stay.**

Within the span of a decade, global retail spend using credit, debit, electronic transfers and eCommerce grew three times from US$14T in 2010 to US$42T in 2020. This number is expected to grow 40% to US$60T in 2024[3]. Underpinning this growth is an increasing number of ways to digitally move money either from point to point, or from one point to many. **We can categorise these digital payment players into three categories.**

The rise of global retail digital spend[3] (US Dollars)



2 Kantar COVID-19 Barometer, fieldwork 27-31 March 2020. The study collated consumer data across 40 markets globally and 11 markets in Asia-Pacific

3 Euromonitor 2019

First, private sector innovations that are geared towards consumer payments.

This consists of digital wallets where consumers can load their money to make payment for everyday needs.

Second, national real-time payment (RTP) systems that are government-owned.

They help facilitate the transfer of money domestically, and there is interest in the development of cross-border capabilities.

Third, digital currencies which are essentially money that exists in digital form, i.e. they do not have physical forms such as cash and coins.

Controlled by cryptographic keys, they are transacted and recorded on blockchain networks.

For many, the appeal of digital currency may not be so apparent and in fact, could seem like a vague concept given the many other digital payment methods we already have to manage the way we pay and get paid.

How might digital currencies differ from the first two categories? Let's first take a step back and define what money is.

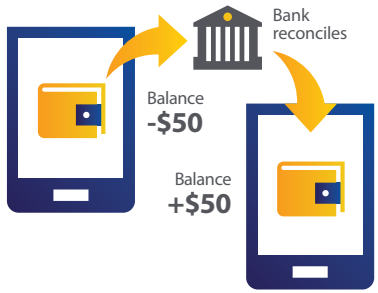
Money serves three basic roles: as a unit of account, a store of value, and a medium of exchange.

The first two digital payment modes work by storing and exchanging payment information.

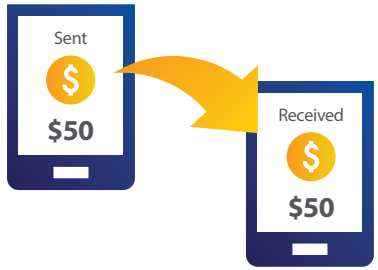
In other words, money itself doesn't move from buyer to seller when a transaction is made. Instead, the payment systems transmit messages that denote the change in balances, and these are eventually reconciled during the settlement process.

Digital currencies on the other hand, are bearer assets and similar to physical cash, the payment system moves the actual asset from buyer to seller with the transaction recorded on a blockchain ledger.

Digital wallets and domestic RTP systems



Digital currencies



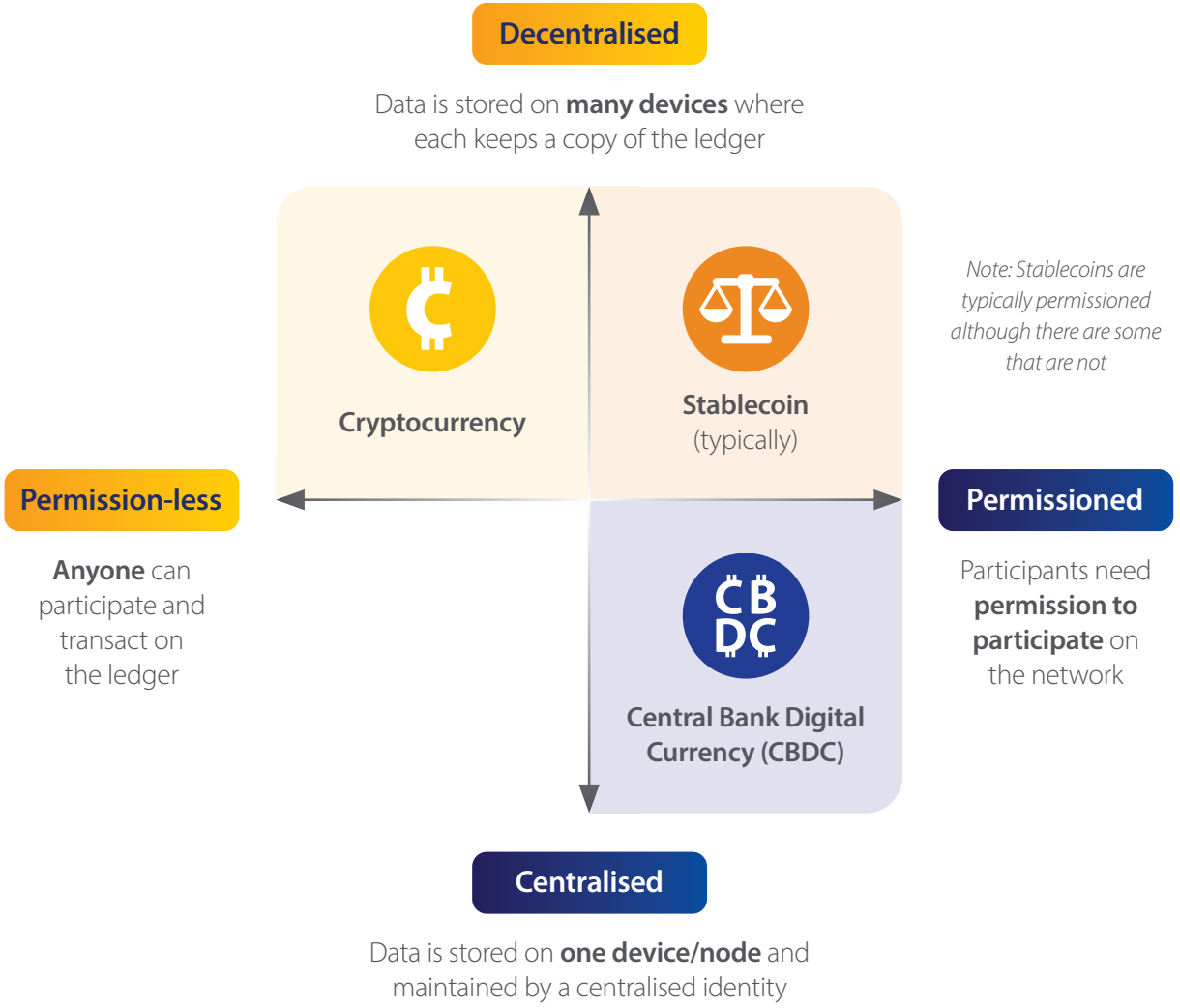
Role of blockchain in digital currency

Digital currency is often associated with blockchain, which is a type of database that enables information to be recorded on a digital ledger in an immutable way.

Blockchain collects information together in blocks. When new data is recorded, a fresh block is formed, which is chained to the previous block. Every transaction and exchange will be documented on the blockchain, which makes it hard to tamper with the data.

The main attributes of blockchain can be broadly characterised in the table on the right.

The type of technology that gets adopted will be determined by the purpose and use of digital currency.



What are digital currencies?

Digital currency is a digital version of cash.
There are three types of digital currencies.

Cryptocurrency

1980s; 2008 (Bitcoin)

Attempt at creating a currency that did not rely on central banks

High volatility, limited acceptance and interoperability

Predominantly held as assets that are not used as a form of payment in a ubiquitous way

Examples: Bitcoin, Ethereum

Stablecoin

Mid 2010s

Developed to mitigate the volatility and therefore limited use of crypto

Issued by private entities and can be backed by assets, i.e. pegged to fiat currencies or gold, or non-collateralised

Examples: USDC, Diem, DAI

Central Bank Digital Currency

2020

New form of money issued by central bank directly to its citizens, exists exclusively in digital form

Basically cash but in a digital form, able to be received and spent directly

Examples: eCNY (China), e-Krona (Sweden)

Three types of CBDCs

Retail CDBC: for transactions between consumers and businesses

Wholesale CBDC: interbank transfers and settlements

Hybrid between retail and wholesale

Types of digital currency

Digital currencies encompass cryptocurrency, stablecoin and central bank digital currency (CBDC).

The first are cryptocurrencies. The most well-known of which is bitcoin.

Its decentralised blockchain network went live in 2009 after the publication of a white paper in 2008 by an unknown person or group calling itself Satoshi Nakamoto.

Visa views this segment of digital currency as an asset class or 'digital gold'. These cryptocurrencies are not used as a form of payment in a ubiquitous manner at this point in time due to a number of reasons such as its high volatility, low transaction throughput and limited acceptance.

The second segment are fiat-backed digital currencies,

namely stablecoin and CBDC, which are emerging payment innovations that could have the potential to be used as legal tender for global commerce, much like current fiat currency. Whereas cryptocurrencies are decentralised and volatile, stablecoins are designed to offer stability. The limited volatility increases the possibility of digital currencies being used for payment.

Recently, CBDC has gained significant interest among a growing number of central banks with three in five conducting pilots or proof of concepts[4] – spurred in part by growing interest in cryptocurrencies as prices appreciate and the development of stablecoin such as Facebook's Diem.

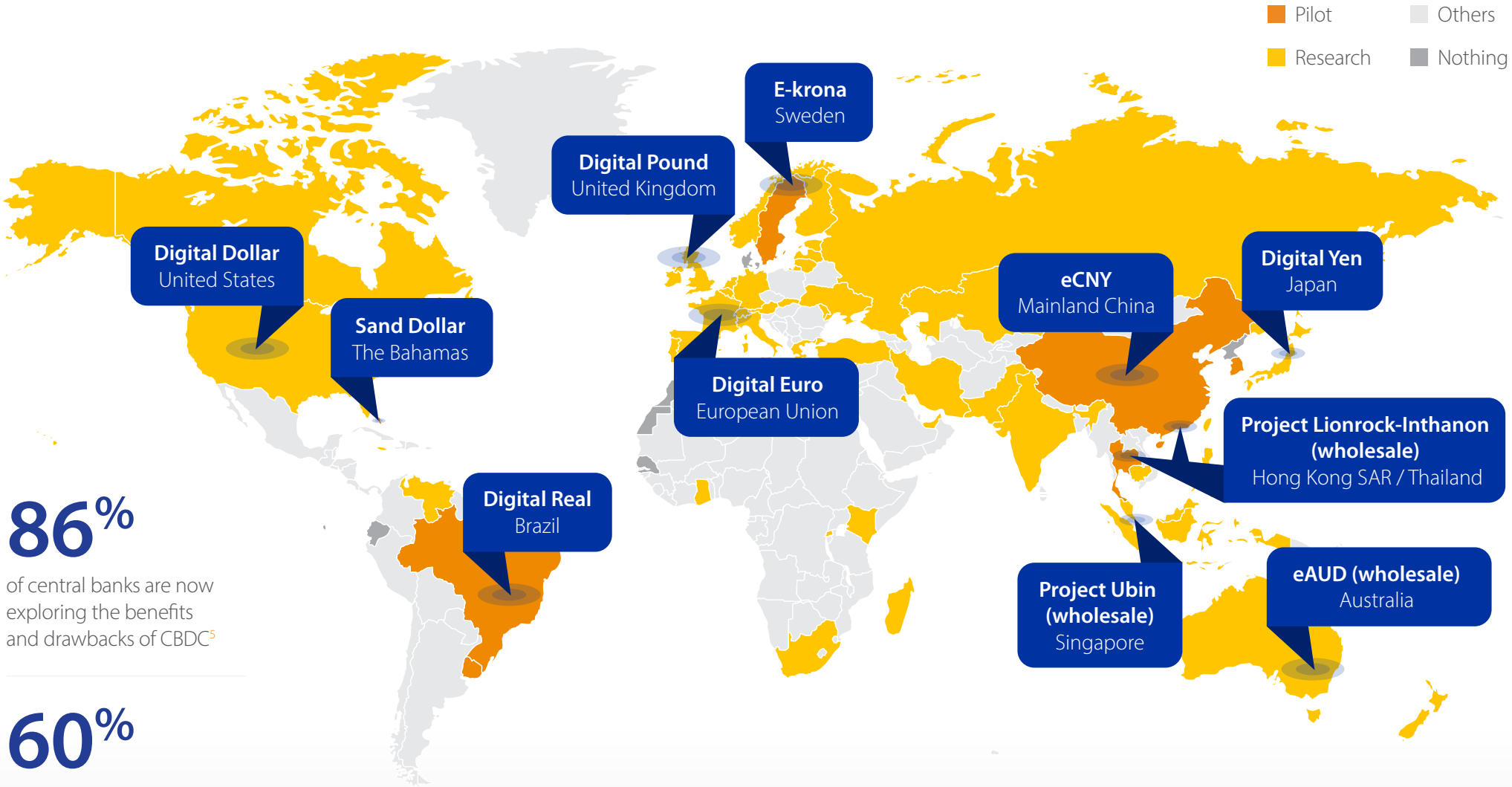
In Asia Pacific, several countries and regions have several CBDC research projects underway with pilots in Mainland China, Hong Kong SAR, and Thailand.

The development of digital currencies began much earlier

- Ecash was created by David Chaum in 1983 as an anonymous cryptographic electronic money signed by banks.
- Subsequently, there are other attempts at creating other decentralised virtual currencies, such as Bit Gold and b-money in the 1990s.

4 Bank of International Settlements Central Bank Survey on CBDCs

CBDC development around the world



86%

of central banks are now exploring the benefits and drawbacks of CBDC[5]

60%

of central banks are now conducting pilots or proof of concepts[5]

5 Bank of International Settlements Central Bank Survey on CBDCs
Map source: Atlantic Council, BIS

CBDCs are being developed all around the world, with Asia Pacific at the forefront of innovation.

As more markets explore CBDC, it is timely to understand the factors that are influencing its development in the region and the impact it will have on broader payments ecosystem. Visa believes that with governments entering this space, collaboration between private organisations and developer communities will be crucial for digital currency to reach critical mass.

Trends influencing CBDC and Visa's views

Trend #1:

Led by market specific goals, policymakers are driving three variants of CBDC

Of the three kinds of CBDCs – retail, wholesale, and hybrid – **central banks will determine the variant and speed by which they are introduced.**

It is possible that a variety of CBDCs could be deployed eventually, depending on the outcomes that policymakers intend to achieve through CBDC.

For example, a retail CBDC will be particularly valuable in markets who are prioritising financial inclusion to bring people into the formal financial system. On the other hand, markets that are looking to strengthen its financial capabilities to become a financial hub could focus on wholesale CBDC to enhance its interbank settlement, as seen in the Monetary Authority of Singapore and the Bank of Canada exploring joint CBDC for cross-border payments in 2019.

The hybrid variant will occur in instances where markets want to pursue a variety of outcomes. For example, Thailand and Japan have announced their intention to develop wholesale CBDC, but at the same time, also expressed interest in extending their efforts to consumer payments. This could mean the development of a wholesale CBDC first before pivoting to include elements of retail CBDC.

The type of blockchain networks chosen by central banks to roll out CBDCs will determine how quickly these state-backed digital currencies are adopted and used.

As such, engagement with developers, wallet operators and exchanges in the crypto and digital currency communities is crucial.

Trend #2:

CBDC rollout requires clear guiding principles for banks, fintechs and merchants to drive adoption

Regardless of the CBDC variant that is being pursued, there will be a few key building blocks policymakers will look to put in place to ensure success.

First, central banks will likely favour a private-partnership model **with commercial banks to reap economies of scale for deployment.**

This means commercial banks have to be ready to integrate and support the use of CBDCs, likely in collaboration with crypto wallets and exchanges.

By the same token, it will be more efficient to lean into open platform communities and developer ecosystems to drive innovation to create new value-added services and capabilities for CBDCs, than to rely on central banks alone. Doing so will create a fertile ground that encourages new business models and use cases of CBDCs.

The success of retail CBDC hinges on merchant acceptance. Consumers may not adopt a new way to pay because merchants either do not accept or understand how a new payment option works.

A concerted effort to educate and support commercial banks and fintechs to roll out merchant wallets and point-of-sales systems will be crucial.

Trend #3:

CBDCs will complement, rather than replace, existing payment infrastructure

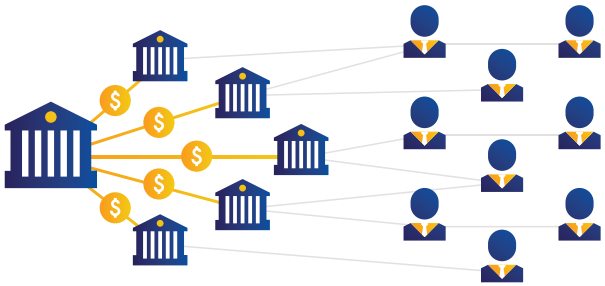
Given the momentum around digital currencies and their origins as a decentralised form of payment, CBDCs might be seen as disrupting the existing payment infrastructures, by disintermediating the roles of commercial banks.

Indeed, earlier designs of CBDC had considered having the public directly open digital currency accounts with the central bank. However, nearly all models now opt to leverage commercial banks as a distribution mechanism. This is because direct access to central banks is not only costly, but technically challenging to implement. Instead, we expect central banks to leverage their existing relationships with traditional and new payment players in a collaborative fashion.

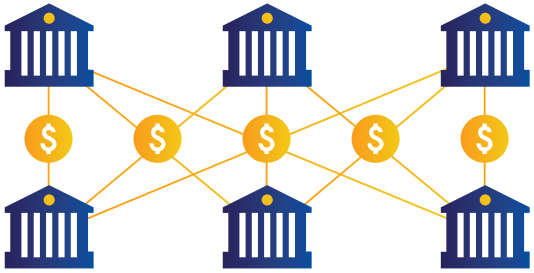
When it comes to **retail CBDC**, traditional and new payment players provide an effective distribution network to drive greater adoption and use. The strength of their relationships with consumers, and breadth of acceptance with merchants, will prove valuable in helping retail CBDC to scale.

For **wholesale CBDC**, participation by commercial banks means a greater number of participants for interbank transfers, which feeds into the network effect and increases the value for all participants.

Retail CBDC



Wholesale CBDC



This development is similar to what we have seen with the introduction of digital wallets, which have been widely available across Asia Pacific for years, but have not completely displaced the use of cash as some in the industry had originally predicted. **Hence, we expect CBDC to mould itself into the payment habits of consumers and co-exist alongside current payment methods.**

Trend #4:

Ecosystem roles will evolve as existing and new players start to participate in CBDC

While the complementary nature of CBDC will minimise the disintermediation of existing payment infrastructures, **we foresee its introduction could impact the role each participant plays in the payment ecosystem.**

Let's start with commercial banks. As seen in trend 3, the value of commercial banks lies in their reach and they will likely be co-opted to participate in CBDC by the central bank. **This will entail investments on their part to provide the secure handling and storage of digital currency,** and in the case of retail CBDC deployment, the option to provide digital wallets to consumers (if they already have not done so).

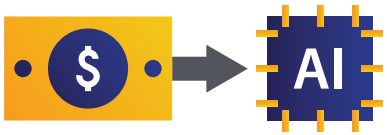
Next, the payment landscape could become more competitive as opportunities open up for non-traditional players who are looking to play the role of intermediaries for central banks. At present, we already see tremendous interest in the application of digital banking licences in Asia Pacific. We expect to see a parallel with CBDC, albeit a more aggressive one, as CBDCs are bearer assets, which means there will be less onerous liability requirements (banking licences, liability risks, counterparty risks, etc.). This creates a lower barrier to entry and therefore a more attractive proposition that encourages the entry of new players such as big techs, fintechs and non-traditional payment players.

Because the roles of each player have shifted, the familiar four-party model could evolve as it accommodates new entrants looking to be intermediaries of CBDCs.

In this new dynamic, opportunities could lie in the development of value-added services instead of the usual issuance, authorisation and settlement services.

Trend #5:

Participants will need to invest in new capabilities, technologies and education to capture opportunities in the CBDC space



With participants in this new CBDC paradigm taking on new roles, they will need to consider **investments in new capabilities and technologies.**

The first is the ability to provide a streamlined front-end user experience as CBDCs are likely to be accessed in similar fashion to existing digital payment methods. The reality is that users have come to expect a high quality digital-first experience, and **participants who have not yet invested in meeting the high bar expected by consumers will need to do so.**

The second point of consideration will be on the back-end. While consumers are unlikely to differentiate the user experience of existing digital payments and CBDCs, creating the right infrastructure and networks will make or break the experience. For examples, participants need to consider how to store cryptographic keys and transfer digital currency tokens.

For new innovations to scale, considerable investment into education will be required to ensure users are aware and comfortable using them. This is especially true when it comes to payments, where consumers are concerned over the safety and security of their money. We've seen this with the introduction of contactless payments, where considerable effort was required to educate consumers about the underlying security of the technology, on top of its convenience of use.

All ecosystem participants will need to act

Central Banks & Regulators

- Develop standards/rules
- Develop issuance/ custody tech
- Run digital currency pilots
- Distribute tokens through intermediaries to consumers
- Drive adoption through intermediaries

Fintechs/Consumer Tech Platforms

- Enable transaction/settlement
- Build tech to custody digital currency keys
- Maintain trusted security infrastructure
- Distribute tokens to consumers
- Prepare consumer facing wallets
- Create interoperability across wallets

Merchants

- Understand use cases and differences versus alternatives
- Acquire a merchant wallet from a financial institution/fintech
- Accept digital currency
- Develop reporting to aggregate payments across methods

Financial Institutions (Issuing/Acquiring)

- Enable transaction/settlement
- Build tech to custody digital currency keys
- Maintain trusted security infrastructure
- Distribute tokens to consumers
- Prepare consumer facing wallets

Networks

- Facilitate transactions/ settlement
- Originate cross-border payments
- Enable interoperability across digital currencies/ other payment methods

Consumers

- Understand digital currency use cases and differences versus alternatives
- Acquire a consumer wallet from a financial institution/fintech

The introduction of CBDCs can have a profound impact on the roles of **each participant in the payments ecosystem.**

As developments in CBDC gain pace with central banks, there is a window of opportunity for those in the payments ecosystem to ready themselves now to enable digital currency. Doing so can ensure the necessary infrastructures and capabilities are in place, while positioning themselves as leaders in the digital currency space when CBDCs are eventually deployed.

Visa's key areas of focus for digital currencies

We have spent the past few years studying developments in the digital currency space and are focused on adding value to shape and support the role it plays in the future of money.

Our focus spans three areas:

- Digital currency products and partnerships
- Digital currency innovation hub
- Research and development

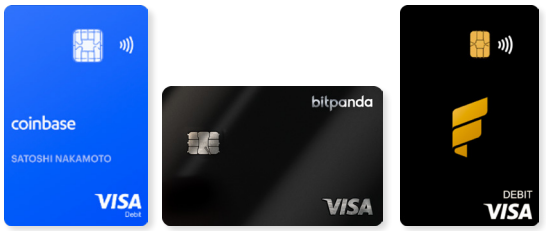
Digital currency products and partnerships

We've been developing new products and capabilities, and investing in and partnering with leading digital currency wallets and infrastructure providers so as to enable the use of digital currencies in a safe and secure manner.

Digital Wallets

Across Asia Pacific, the use of digital wallets is gaining prominence and we're looking to build on that with the ability to transact with digital currencies. We are enabling our banks, merchants and fintech partners to process and accept digital currencies. We are working with over 35 digital currency wallets and exchanges to issue Visa credentials and expand merchant acceptance of digital currency. We're supporting this in two ways:

Enabling digital currency players to issue Visa credentials (or Visa debit and credit cards) to their customers, so they can make purchases anywhere Visa is accepted.

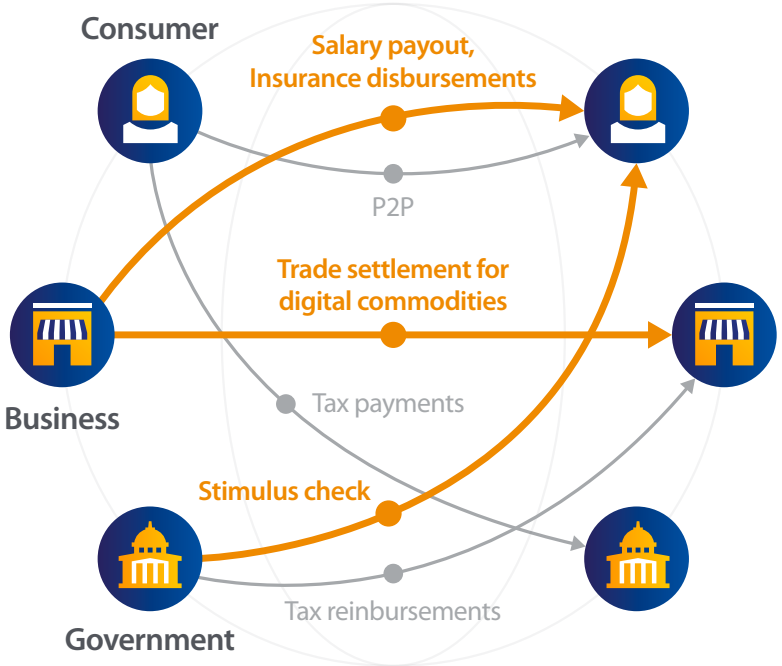


Coinbase Visa Debit Card | Bitpanda Visa Debit Card | Fold Visa Debit Card

Enabling businesses to pay employees in digital currencies through the use of a corporate card, which in turn can be used to make purchases anywhere Visa is accepted.

New Digital Currency Flows

Similar to cash and digital payments, we believe the benefits of digital currencies extend beyond the usual consumer-to-business payments. We have decades of experience in moving money across a variety of payment flows and are confident in applying our expertise to the digital currency space. We can support new ways to pay and be paid using digital currency such as in business-to-business or peer-to-peer transactions.



Digital Currency Settlement

Whenever a purchase is made using a Visa card, the transaction will require settlement. This involves authorisation and the transfer of funds from buyer to seller. Similarly, for digital currencies, we enable our partners to settle with Visa using digital currency. This ensures payment gets where it needs to where it's supposed to go, when it's supposed to be there.

Visa Crypto APIs

For banks or fintechs who are lacking a digital currency offering and are looking to develop one, they can utilise Visa Crypto APIs. Doing so provides them with a new innovative offering to their existing customer base without the need for their customers to use a separate crypto exchange.

Digital currency innovation hub

We have launched a global innovation hub where likeminded partners can jointly develop solutions and user experiences in the realm of digital currency. At our hub, partners can gain access to industry insights and work closely with our subject matter experts to:

- **Discover:** uncover trends in digital currency and explore growth opportunities
- **Co-create:** research, design and test solution concepts for new digital currency technologies using human-centred design
- **Build:** develop and pilot proof of concepts with payment engineering experts

Research and development

As the world leader in digital payments, we recognise we have a responsibility to lead and contribute to discussions shaping the digital currency space. We are looking to expand knowledge through our research, development of best practices and global, interoperable standards.

Offline Capability

We published a technical paper that outlines an innovative approach for making face-to-face, digital currency transactions possible, when neither the buyer nor the seller has a connection to the internet. This enables the use of digital currency as a real-time medium of exchange much like physical cash.

Custody Services

Custody services perform the same function for digital currencies that bank vaults do for cash, which is the safe and secure storage of assets. The main consideration for custody services lies in striking a balance between accessibility and security. Frequent access usually means less stringent security measures to facilitate a better user experience, while stricter security measures could hamper the time and effort required to utilise digital currencies.

Getting this balance right will improve the overall experience of digital currencies while maintaining the integrity and security of transactions. Visa is actively investing in cryptographic custody services to provide cutting edge custody infrastructure that allows for high-frequency access while maintaining high standards of security.

Accessibility
near real-time access
but limited security

Security
access could take days
but stringent security

Visa's research is focused on developing cutting edge standards for digital currency

Summary

For any technology to gain widespread adoption, it has to work for people in variety of contexts, but more importantly, it must be safe, secure and reliable. Digital currency is no different.

At Visa, we are focused on being the best way to pay and be paid, regardless of the channel or mode of purchase. To do that, we want to be able to support transactions when and where it occurs, across an expanding range of channels. We are ready to support digital currency when it becomes recognised as a means of exchange, similar to the other 160 currencies we already support on our network today.

VISA

For more information, visit www.visa.com

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