

Tokenization and Development

Framework and Insights

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Research Goals

This research aims to map the landscape of tokenization for development, highlight its impact, and propose a way forward by:

1. Providing an overview of the current state of tokenization.
2. Showcasing best practices and use cases of tokenization to support development.
3. Offering a way forward and call to action to further develop the use of tokenization for development.



Current State of Tokenization

Tokenization

- Tokenization is a foundational application of blockchain technology. It enables converting rights to an asset into a token on a blockchain.
- Tokens represent ownership of an asset such as art, real estate, commodities, securities, value, and utility and can be owned, traded, and transferred on a blockchain.
- Tokenization addresses challenges like liquidity, rules, and fractional ownership while facing hurdles such as regulatory uncertainty, interoperability and user adoption.

Tokens and blockchains reinvent the idea of digital ownership.

Crypto Assets

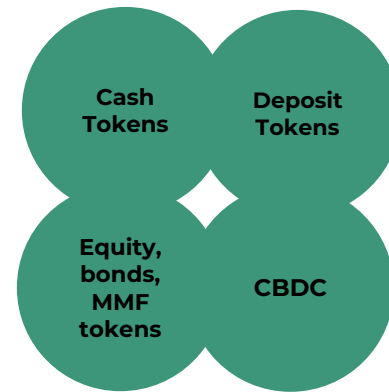
Currency tokens (crypto)    

Currency tokens (Stablecoins)    

Non-fungible tokens (NFT) 

Governance tokens  

Digital Assets

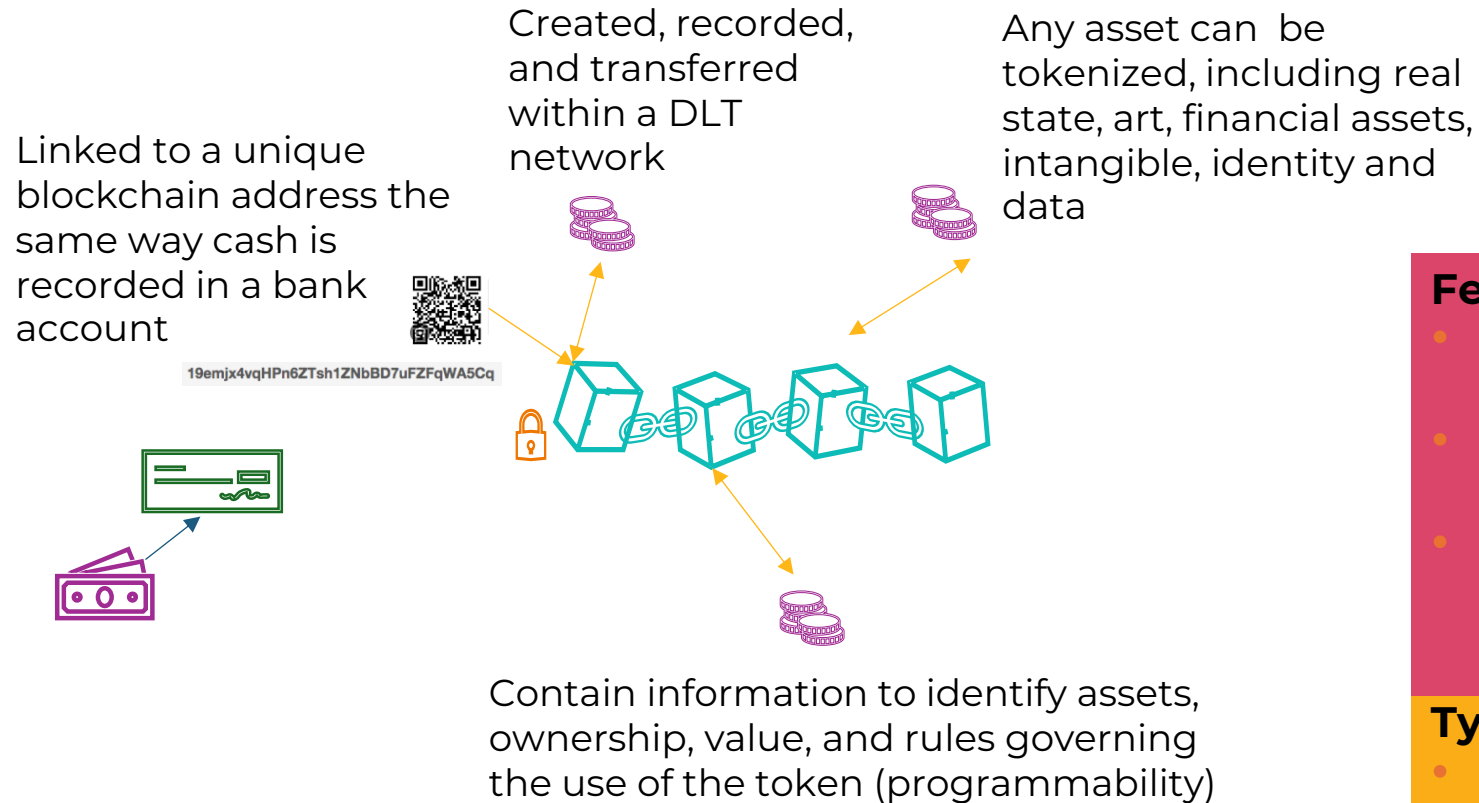


BCG forecasts US\$ 16T of assets tokenized by 2030, representing 10% of the global GDP.

By managing assets as tokens, tokenization enables:

- Fractional ownership
- Improved liquidity
- Supply chain visibility
- Access to new capital markets

Token is a *digital* representation of an asset or information



Features

- Transparency: blockchain's public ledger ensures transaction visibility
- Liquidity: easier trading of illiquid assets due to fractional ownership
- Efficiency: smart contracts automate and streamline processes such as asset transfer and dividend payment

Types

- Utility: access tokens for a platform such as Ether for Ethereum
- Security: tokenized stocks and bonds
- Real World Assets (RWA): tokenized real-estate

Tokens enable digital ownership and programmability across a wide range of assets.

Blockchain Technology

- Blockchain technology powers tokenization. Blockchains are the roads and tokens are the vehicles that run on those roads.
- Blockchain addresses general challenges related to decentralization, security, transparency, and governance.
- Smart Contracts, a feature of blockchain, automatically execute agreements written into code. Smart contracts enforce agreements without intermediaries and at the same time automate transactions on a blockchain.
- Ethereum, for example, powers tokenization via its ERC-20 standard, enabling stablecoins such as USDC and many decentralized applications.
- Blockchain addresses challenges such as trust, transparency, and security in decentralized system, while facing hurdles such as scalability, energy consumption, regulatory uncertainty, and interoperability across networks.

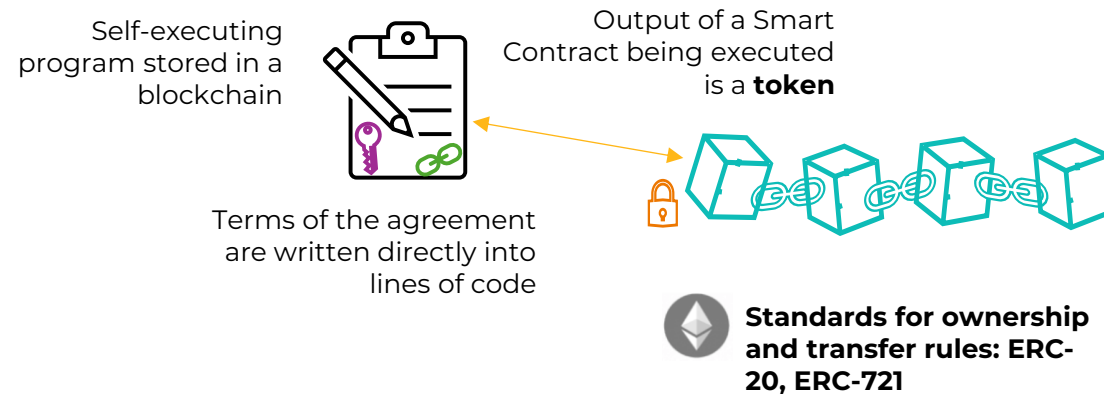
Applications

- Cryptocurrencies
- Decentralized Finance (DeFi)
- Identity and credential management
- Smart contracts
- Healthcare
- Gaming

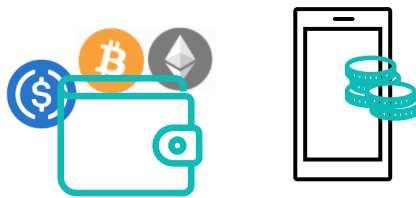
Blockchains introduce a new form of network economy as it combines the openness of protocol networks with the funding mechanisms through tokens (as it represents unit of ownership and unit of value)

Smart Contract and Wallets

Smart Contracts



Wallets



Digital tool that allows users to store, manage, and transact cryptocurrencies

A wallet has a public and a private key

Features

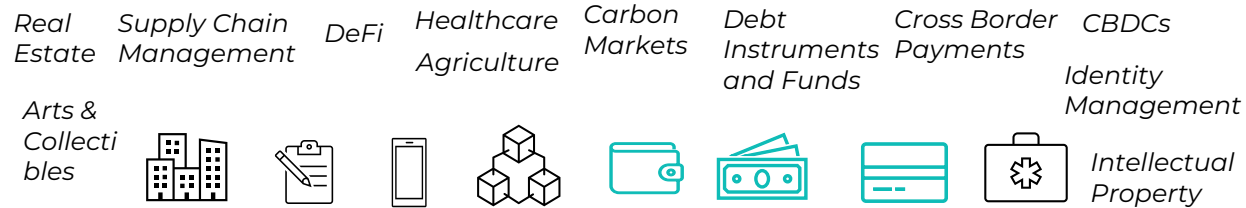
- Programmability and automation
- Trust (executed by the blockchain)
- Efficiency, speed, cost reduction

Types of Wallets

- Custodial
- Non-custodial
- Software and Hardware
- Multi-signature

Blockchain and Tokenization

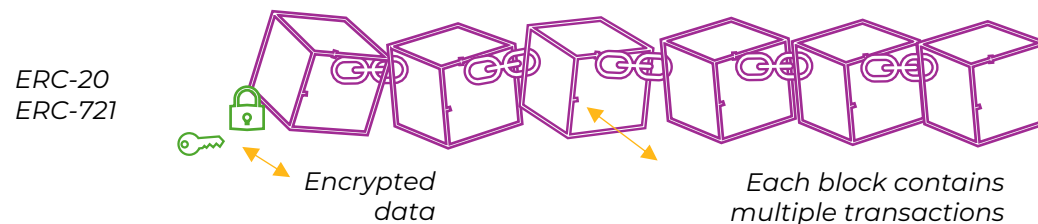
Applications of Tokenization



Tokens Use Cases



Blockchain Infrastructure, Standards



Blockchain Features

- Immutability
- Secured by cryptography
- Transparency
- Traceability
- Always-on
- Programmability

Types of Blockchain

- Centralized vs Decentralized
- Public, permissionless (Bitcoin for peer-to-peer transactions, Ethereum for DeFi)
- Public, permissioned (e.g., LACChain)
- Private, permissioned (e.g., Onyx, Citi, Regulated Liability Network)

Blockchain enables the secure creation, management, and transfer of tokens through its secured and programmable infrastructure.

Key Trends in Tokenization 1/2

- Increased **institutional adoption** to improve efficiency and access to capital markets.
- Tokenization and blockchain are **diversifying** beyond finance into tokenized carbon credits and renewable energy assets, supply chain, gaming assets, and digital identity and credentials.
- **Stablecoin adoption** for cross-border and humanitarian payments, and store of value against currency debasement.
- **Real-World Asset (RWA)** tokenization is gaining momentum. By turning traditional financial assets such as real estate, commodities, equity, bonds into tokens, fractional ownership and liquidity is achievable.
- Real-time and atomic **settlement** via tokenized deposits and cash and asset on chain for interbank payments.
- **Central Bank Digital Currencies** (CBDCs) on the rise, with wholesale and retail digital money issued by central banks.

Stablecoin Trends

- Shift from on-ramps to crypto to payments, especially cross-border payments
- Emergence of sandwich stablecoin (fiat-stablecoin-fiat)
- Stablecoins yield interest
- Stablecoin issuance-as-a-service

Key Trends in Tokenization 2/2

- **Supply Chains and Trade Finance** tokenization adoption due to demand for transparency in global supply chains. Tokenization enables traceability and streamlines access to trade finance for SMEs.
- **Emerging** standards such as roll-ups, L2, and on-chains.
- **Interoperability** across blockchain networks for cross-chain communication for tokenized assets and bridge stablecoins and tokens across Ethereum, Solana, and Avalanche for example.
- Blockchain technology use on regulatory technology (**RegTech**) for **compliance and Know-your-customer** (KYC).
- Increase attention by regulators and improved **regulatory frameworks** to address investor and consumer protection, fraud, and fragmentation.
- Digital **IDs** and verifiable **credentials** for improved management, control, and verification of personal data.
- **User experience (UX)** has improved and with it, opportunity to reach mainstream has increased.

Technology is changing how we interface with money. Thus, trends in tokenization reflect the evolving landscape of blockchain, digital assets, and RWAs.

Tokenization is poised to reshape global markets and democratize access to assets.

Global Perspective of Tokenization 1/2

- **Asia** is leading the way in innovation and regulatory frameworks. Singapore and Hong Kong have become global hubs for tokenization. For example:
 - Monetary Authority of Singapore (MAS) launched project Guardian.
 - Hong Kong is promoting tokenized green bonds.
 - Japan is exploring fractionalized ownership via real estate tokenization platforms.
 - China launched its Digital Yuan.
 - The Asian Development Bank (ADB) is experimenting with tokenized bonds.
- **Europe** is focusing on regulation and institutional adoption. For example:
 - Markets in Crypto Assets Regulation (MiCA) to regulated digital assets including tokenized securities and stablecoins.
 - Europe is heavily focused on green finance i.e., tokenized carbon credit and renewable energy assets.
 - European Central Bank is piloting a Digital Euro.
 - Switzerland has introduced a DLT framework enabling companies to issue tokenized shares on a blockchain.

Global Perspective of Tokenization 2/2

- **North America** is going through market and institutional growth:
 - Stablecoins and tokenized financial instruments are gaining traction.
 - Financial market players are piloting token-based platform integrations.
 - Regulatory uncertainty is pushing industry to be regulated by enforcement.
- **Emerging markets** are focusing on inclusive finance and innovation:
 - In **Latin America and the Caribbean**, LACNet (born out of IDB LAB's LACChain) a blockchain-based platform, is using tokenization to boost agricultural value chains and verified credentials.
 - In **Africa**, there is a focus on using tokenization to improve access to capital markets.

Regions vary in leadership and applications: Asia and the EU are leading in tokenization adoption, with Asia focusing on financial innovation (e.g., tokenized bonds, real estate) and the EU driving regulation through MiCA. Meanwhile, Latin America and Africa use tokenization to promote financial inclusion, and North America leads in stablecoin-driven tokenized financial instruments.

Problems Tokenization would solve

- High cost, low-speed, and lack of transparency in payments, especially cross-border payments and asset transfers.
- Identity and credentials verification processes are fragmented and unsecure, which makes KYC and onboarding cumbersome.
- Lack of flexibility and programmability for solutions such as automated savings, cash transfers, microloans, insurance, etc.
- Lack of liquidity, especially in illiquid markets such as real estate.
- Limited access to credit because small businesses cannot provide liquid or verifiable collateral.
- Limited access to investment opportunities.
- Counterparty risks in capital market transactions.

Reduce
counterparty risk

Empowers users
and democratize
access

24/7 markets

Access to
liquidity assets
and pools

Faster and/or
atomic
settlement

Transparency

Operational
efficiency

Programmability

Composability

In the traditional financial system money moves in batches and there are many pieces.

The tokenization of financial assets, such as cash, deposits, securities, and central bank digital currencies (CBDCs), can expedite and automate payments, clearing, and settlement –*while still regulated on the type of asset and on/off ramps*– with transformational implications for cross-border payments and inclusive finance sectors.

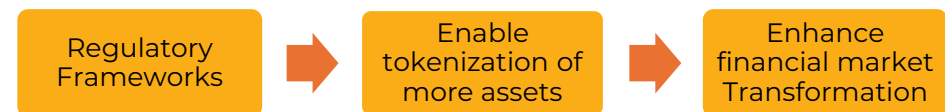
Opportunities

Financial and User Centric Opportunities

- **Reshaping the financial market** with well regulated stablecoins and settlement efficiencies can transform financial services and democratize access to payments.
- **Tokenized deposits** as a front-end opportunity bring settlement to the front end. Tokenized deposits could enhance efficiency for consumers.
- Improved **user experience (UX)** is vital for mainstream adoption of digital assets.
- There is a case for wholesale **CBDC** in the last mile settlement, as it enables faster, programmable, and atomic settlements in financial markets.

Technical and Regulatory Enablers

- **Open networks** enable interoperability and have the potential to be a well-regulated technology by enabling controls at the asset level.
- Importance of regulatory certainty and comprehensive **regulatory frameworks** for digital assets.
- **Tokenization of more assets** while ensuring compliance, e.g., KYC, AML, and CFT.
- **Collateralized borrowing** as users can borrow fiat currencies from regulated FIs using digital assets as collateral.



Blockchain is a general-purpose technology and has the potential to be a force for **social good** as tokens help redefine the concept of **ownership** and it **pushes value** to participants of the networks.

Challenges and Risks 1/2

Regulatory

- **Regulatory uncertainty:** there is a lack of clear –let alone– harmonized global regulatory frameworks for digital and tokenized assets.
- **Information flow and compliance:** while value now can move faster with transparency and programmability, ensuring compliance (KYC, AML) on the on and off ramps is still a challenge.
- **Stablecoin standards and consumer risks:** while the use of stablecoins continues to grow, lack of standards with potential consumer risks remain, such as fragmented liquidity, concentration of stablecoins, proliferation of unbacked stablecoins.

Technical

- **Cross-chain and wallet interoperability:** different blockchains and wallets operate in silos, preventing seamless transfer of tokenized assets.
- **Scalability and performance limitations** of blockchain networks: L1 networks such as Bitcoin and Ethereum face congestion and gas fees. Scalable options like L2 and roll-ups like Optimism are still evolving.
- **Security risks and smart contract vulnerability:** while blockchains are secure, smart contracts and tokenized applications still face coding flaws, vulnerabilities, and not enough auditing before deployment.

Challenges and Risks 2/2

Adoption

- **Complex interfaces, UX, and digital literacy:** While UX has improved, complex interfaces still hinder streamline adoption, especially by non-technical users. Understanding of private keys, addresses, assets custody, and wallet management presents friction to users.
- **Integration with legacy systems:** blockchain-based solutions need to interact with legacy systems. If not part of financial institution's ledger, then additional reconciliation processes and reporting are required.

Liquidity and Distribution

- **Market liquidity fragmentation:** tokenized markets such as real estate still lack liquidity. A fragmented infrastructure inhibits large-scale liquidity pooling.
- **Secondary markets and distribution:** many tokenized assets lack robust secondary markets, making it difficult for investors to trade or exit positions.
- **Counterparty risk and trust:** the risk of one party in a transaction fails its obligations erodes trust and causes market participants to refrain from market activities which affects liquidity.
On and off ramps: the infrastructure to bridge traditional and digital assets remains underdeveloped.

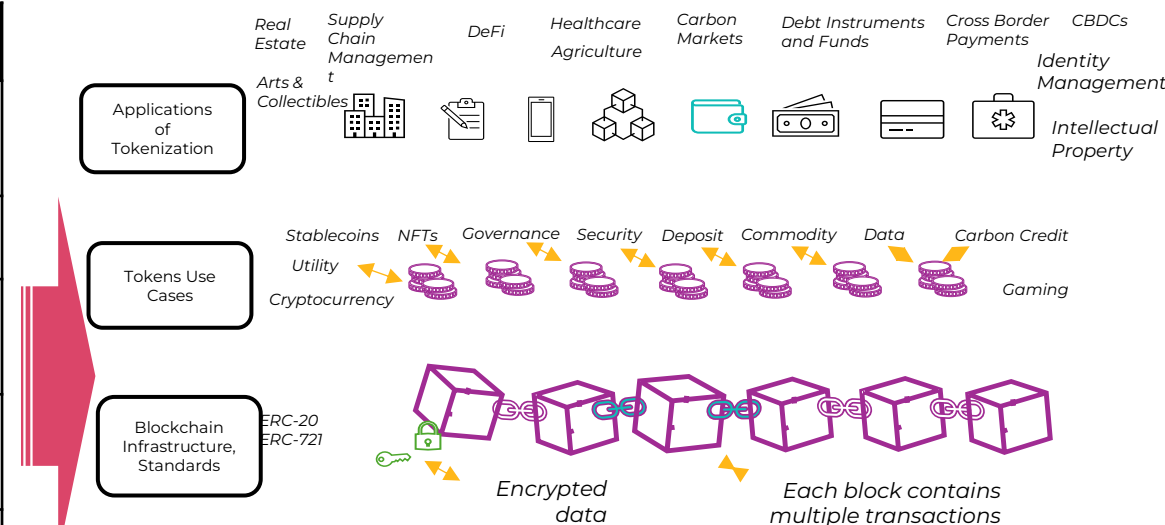


Evolving Ecosystem

Evolving Tokenization Ecosystem

The ecosystem brings together diverse stakeholders, traditional players, tech companies, regulators, and fintech solutions to transform asset ownership and trading.

Stakeholder	Roles	Examples
Blockchain Platforms	Provide the underlying infrastructure such as core layer, layer2, along consensus mechanism.	Ethereum, Polygon, Algorand, Celo, Avalanche, Solana, Stellar, Canton, Hyperledger, LACChain
Token issuers	Facilitate the creation and issuance of tokens.	Circle, Paxos, Tokeny, Securitize, Polymath, Sand Dollar, JPM Coin
Wallet Providers	Manage, store, and interact with tokenized assets, ensuring authentication, access, and security.	Custodial, non-custodial, and hardware such as MetaMask, Ledger, Coinbase, Ledger
Exchanges and Marketplaces	Enable the trading of tokenized assets, and provide liquidity, and price discovery.	Coinbase, Securitize, Uniswap, OpenSea, LooksRare, Binance
Buyers (Investors & Asset Holders)	Include asset managers and institutional and retail investors acquiring tokenized assets.	BlackRock, Franklin Templeton, WisdomTree, ARK Invest
Custodians & Asset Management	Maintain secure custody of the tokenized assets.	BitGo, Anchorage, Fidelity Digital Assets, Fireblocks, Coinbase Custody
Blockchain Oracles	Provide external data to blockchain networks, enabling the interaction of tokenized and real-world assets.	Chainlink, API3, Pyth Network



Key difference among Token Issuers

- **Stablecoin Issuers:** private entities providing a token pegged to a fiat currency for payment, trading, or DeFi.
- **Central Banks:** government institutions issuing retail or wholesale digital currency.
- **Commercial Banks:** private institutions issuing asset-backed tokens or tokenized deposits.



Tokenization Use Cases and Applications

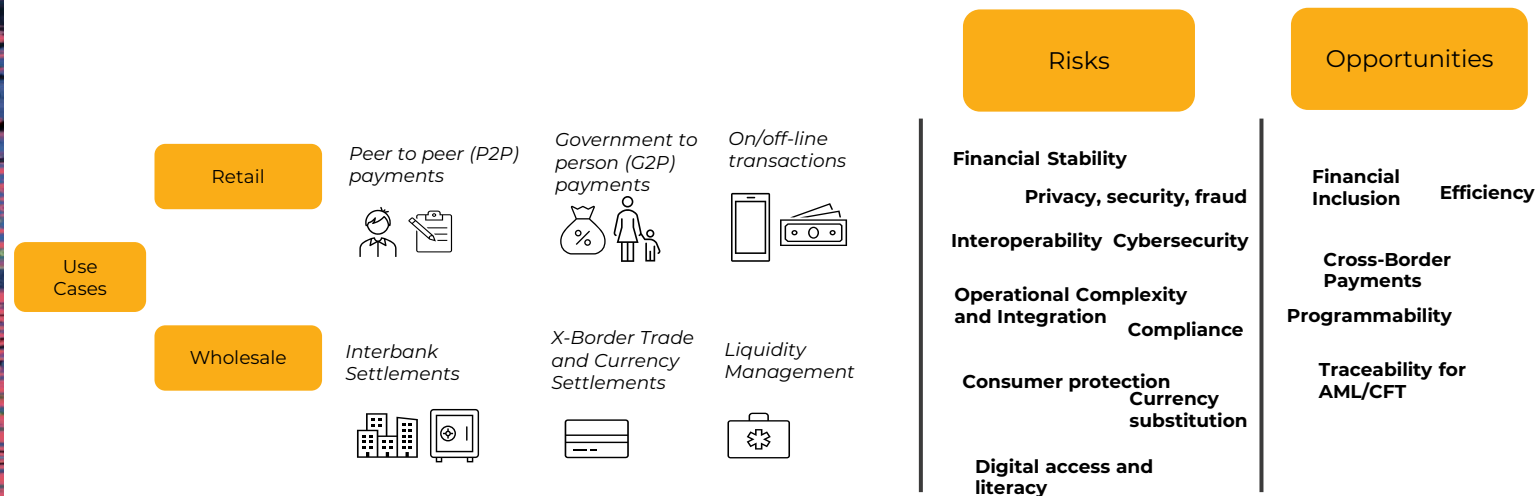
Central Bank Digital Currencies (CBDCs) 1/2

- There is a widespread interest in CBDCs. Governments are testing wholesale and retail **CBDC**. Key question is the added value for both the issuer and the end user of the CBDC. Every country needs to assess CBDCs based on their current situation (e.g., infrastructure and payment rails, identity system, etc.) and design preferences (e.g., privacy, open data, and policy considerations)
- Decision comes down to assess the market environment and needs of each country in comparison to fast payment system and instant payments
- Retail CBDC, such as the digital dollar or euro, is expected to have the properties money has today, that is, unit of account, medium of exchange, and store of value. And have on and offline features for underserved and rural areas.

CBDC is “A digital payment instrument denominated in the national unit of account that is a direct liability of the Central Bank.” (Bank of International Settlements, BIS)

CBDCs by the numbers

- ~98% of global GDP are currently exploring a central bank digital currency
- 3 countries out of 134 countries exploring CBDCs have fully launched a digital currency: Nigeria (eNaira), Jamaica (JAM-DEX), and the Bahamas (Sand Dollar)
- 44 countries are piloting CBDCs including Brazil, South Africa, Australia, India, and Japan
- 50% cost reduction in cross-border remittances could be enabled by CBDCs



Central Bank Digital Currencies (CBDCs) 2/2

Types of CBDCs

- *Retail (rCBDC): Digital currency for the general public.*
- *Wholesale (wCBDC): For interbank settlements and institutional use.*

Consideration	Retail CBDC	Wholesale CBDC
End Users	Households, general public	Financial institutions and banks
Policy	Needs clear legal frameworks for programmability and consumer protection. Also, rCBDC requires a balance between financial inclusion, privacy, and security.	Needs a legal and institutional framework for x-border payment, liquidity, and trade.
Competition	Risks crowding out private payment providers, like banks and fintechs, due to central bank centralization of payments.	Minimal and no competition concerns as it improves private sector efficiency.
Privacy	High risk of surveillance and data misuse concerns.	Lower risk as it involves institutional transactions.
Impact on banks	Risk of potential disintermediation due to loss of deposits. But opportunity for providing CBDC wallet with added programmability.	Low risk as it improves efficiency of existing systems and settlement.
Impact on x-border payments	Enhances remittances efficiency and reduces costs. However, there is a risk a currency substitution due to high inflation.	Reduces settlement time for cross-border transactions and accelerates international trade.
Integration and interoperability	High complexity as it requires integration with consumer apps.	Moderate complexity as institutional integration is required.
Identity	Requires integration with digital identity systems for AML/KYC compliance, risking with it excluding people without access to digital ID infrastructure.	Robust identity verification frameworks are required but at an institutional level.

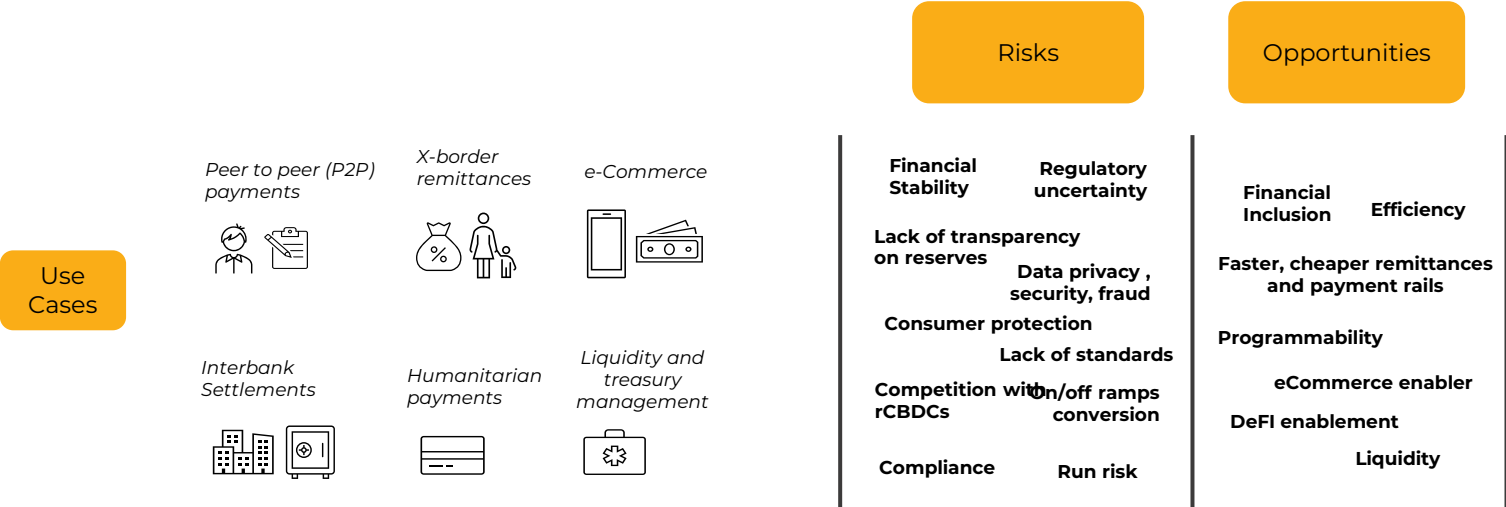
Stablecoins 1/2

- Stablecoins have gone increasing **adoption** globally, triggered by different factors in each region. As stablecoins are private issued money, this growth brings concerns related to their creation and structure as it could represent a stability risk based on the reserves.
- The USD is the prevalent currency for stablecoins. Hence, a **USD stablecoin** might support the role of the dollar in the global economy in cross-border payments. Conversely, it might also present potential systemic risks for emerging economies in terms of capital flows and domestic monetary policy, e.g., USDC and USDT in emerging markets.
- There is a potential **run risk** if the reserves are not liquid, if for example the reserves are invested in multiple currencies, e.g., TerraUSD's collapse.
- A key **innovation** in stablecoins is its transition from supporting crypto trading to yield bearing stablecoins for trade, earn yield, and collateral as well as potentially becoming a global payments rail.
- Business models** for stablecoins at a scale level need to assess its value propositions, rely on current interest rates or go beyond the issuance, and covers the payments ecosystems around it, including wallets, merchants, and payment rails.

Stablecoins are cryptocurrencies designed to maintain a stable value. Thus, stablecoins are pegged to a currency or a basket of fiat currencies or commodities.

Adoption triggers: *Emerging markets (remittance needs, inflation) and developed markets (DeFi and eCommerce)*

Stripe acquired Bridge for \$1.1Bn betting on Stablecoins as the future of global payments



Stablecoins by the numbers

- Market size has reached \$169 billion, dominated by USDT (Tether), USDC (Circle), and BUSD (Binance).
- USDT (\$120Bn) and USDC (\$34Bn) account for more than 90%
- In 2024 stablecoins have settled more transactions volume than Visa and Mastercard with ~\$8.5 trillion in transaction volume during Q2'24 which includes direct consumer and business spending and algorithmic spending.

Stablecoins 2/2

Types of Stablecoins

- Fiat-backed: USDC, USDT
- Commodity-backed: PAX Gold
- Algorithmic: DAI
- Hybrid models



Consideration	Fiat-backed	Commodity-backed
End Users	Retail users, business, and institutions seeking stability and fiat-pegged value for domestic and cross-border payments	Investors, businesses, and users looking for exposure to gold or other commodities but avoiding ownership
Policy	Need for KYC/AML compliance and transparency with the reserves. If adoption reaches mainstream it may face scrutiny over monetary sovereignty.	Subject to commodity regulatory frameworks for trading and financial asset reporting.
Competition	Competes with rCBDC, traditional bank deposits, and payment systems.	Competes with ETFs, physical commodity ownership, and derivatives.
Privacy	Transactions are traceable on public ledgers. Privacy in accordance with KYC/AML regulations,	Varies per jurisdiction.
Impact on banks	Medium to high risk as it may reduce demand for traditional deposits and therefore liquidity.	Low risk on banks. Its use is more investment oriented rather than for everyday payments.
Impact on x-border payments	Enhances remittances as they are faster and cheaper compared to traditional payment systems.	Offers cross-border commodity exposure but not specific to everyday payments and remittances.
Integration and interoperability	Wide integration with DeFi, payments, and wallets. Strong compatibility with public blockchains such as Ethereum and Solana.	Limited to investment platforms or DeFi protocols.
Identity	Requires integration to identity verification frameworks due to KYC/AML regulatory mandates.	Requires onboarding verification due to the investment value, volume and assets involved.

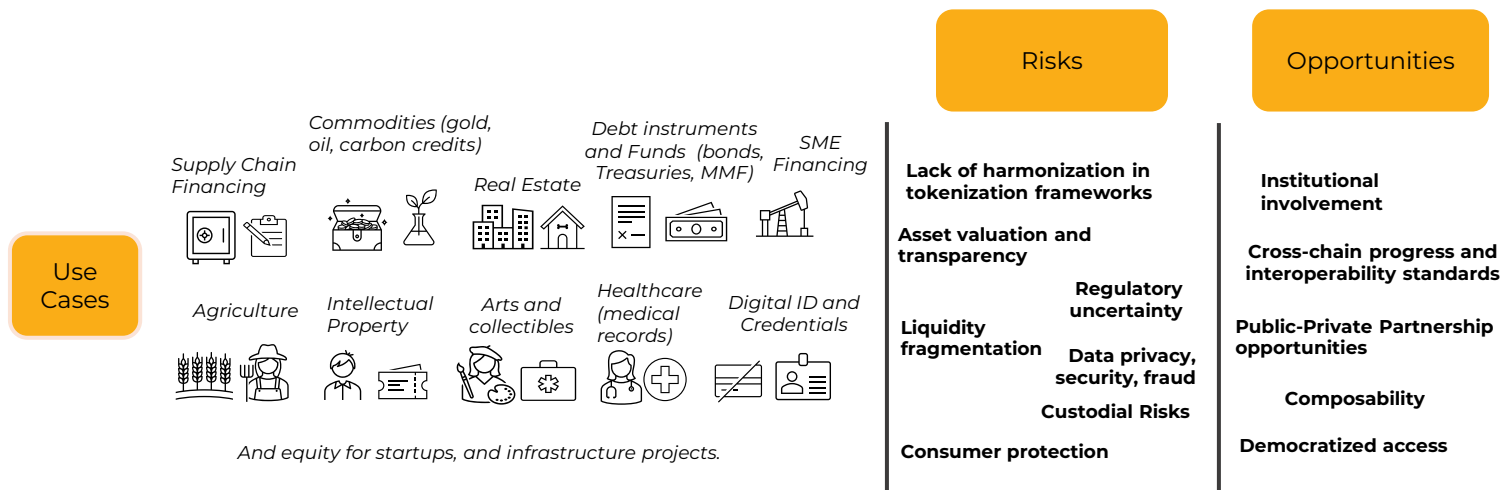
Real World Assets (RWAs)

- RWAs are increasingly being tokenized to improve liquidity, fractional ownership, and global access. For instance, tokenized real state platforms, such as RealT and Propy, are making property ownership accessible to smaller investors.
- There is a growing interest in integrating traditional financial instruments with blockchain technology. For instance, the market cap of tokenized US Treasuries on permissionless blockchain has grown from \$769 million at the beginning of 2024 to \$3 trillion by December 2024.
- Financial institutions such as Goldman Sachs, JPMorgan, Santander and others are exploring RWA tokenization for bonds and alternative investments.
- Key **innovations** in tokenization of RWAs are smart contracts which enable automatic dividend payments and royalty distributions, traceability for investment in projects e.g., green and energy investment.

Real-World Asset (RWA) tokenization is gaining momentum. By turning traditional financial assets such as real estate, commodities, equity, bonds, intellectual property, carbon credits into tokens, fractional ownership, trading, value transfer, and liquidity are achievable.

Phases RWA

- Supply: bringing assets on-chain (e.g., tokenizing real state, bonds).
- Liquidity: establishing secondary markets for seamless trading.
- Composability: using RWAs in DeFi for collateralization, staking, or yield farming. Enable cross-chain.



Adoption Trends

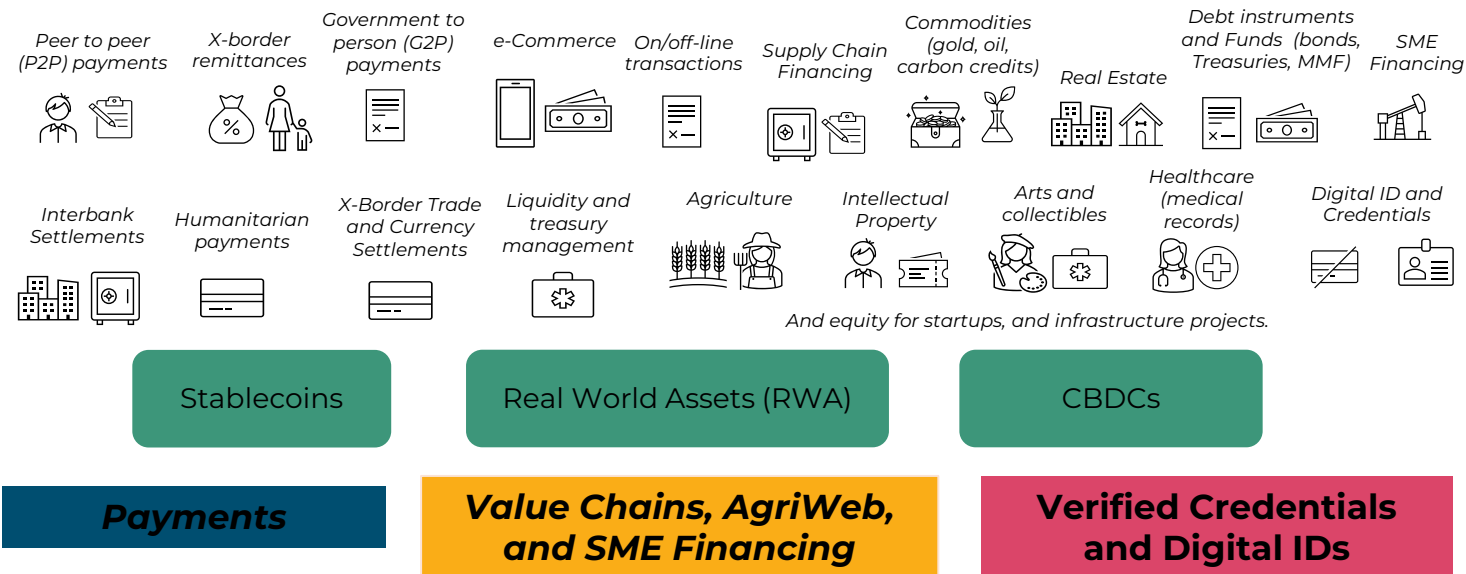
- Asia and Europe:** leading in RWA adoption due to regulatory clarity.
- Integration with DeFi** protocols for yield generation and liquidity pooling (eg., Aave, MakerDAO)
- Greater access** to investment opportunities and unlocking of illiquid assets.



Tokenization for Development and Financial Inclusion

Tokenized Assets, Money, Inclusion, and Development

- Payments and CBDCs are considered public goods. Most of the history of money in banking is about ledgers. However, frictions exist due to centralization. There are two forms of money: token-based (currency tokens, stablecoins, and CBDCs) and account-based money.
- Blockchain technology enables instant transaction and settlement, reducing counterparty risk. This contrasts with traditional commercial bank transactions, which settle later at the central bank level.
- Tokenization unlocks a possibility to simplify global money movement and democratize asset ownership. It allows IDs, records, and credentials to be securely stored on a blockchain ensuring encryption, portability, and privacy.



Tokenized market capitalization could reach around \$2 trillion by 2030
(McKinsey analysis)

Remittances fees average 6-8% per transaction globally

Around 1 billion people lack formal IDs or verifiable credentials

Use Cases for Financial Inclusion 1/3

Use Cases

Description

Examples



Stablecoins for Cross Border Remittances and peer-to-peer payments (digital/unbanked workforce)

Utilizing **sandwich-stablecoins** (fiat-stablecoin for settlement-fiat) and wallets apps that support stablecoins and corresponding blockchains: (1) migrant workers can send money to family members in emerging economies, and (2) Digital, gig, and seasonal workers across borders or in remote areas can receive their payments. Recipients do not need a bank account.

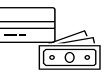
- Stellar blockchain, USDC stablecoin, MoneyGram, and compatible wallet apps such as Decaf.
- Ripple XRP, SBI Remit, for a bank account remittance service from Japan to the Philippines (Coins.ph), Vietnam, and Indonesia (tranglo).
- Bitwage provides services to freelancers globally who get access to faster deposits. Stablecoins enabled are USDC, USDT, CUSD Celo Dollar, and DAI. Blockchains available are Ethereum, Stellar, Celo.



Stablecoins as a store of value and protection against inflation

Protection **against currency debasement** mechanism in highly-inflationary countries by using stablecoins.

- Stellar blockchain, USDC stablecoin, MoneyGram, and compatible wallet apps.
- USDC and USDT with compatible wallet apps in markets with high inflation.



Stablecoins for Humanitarian Aid and Disaster Relief Payments

Permissionless blockchains and stablecoins can provide **quick, safe, and cheaper aid payments**, while maintaining donor transparency and leaving a trail for traceability. Recipients do not need a bank account.

- UN and Stellar Aid Assist: Stellar blockchain, USDC stablecoin, UNHCR, wallet Vibrant or Neon, and MoneyGram for aid payments in Ukraine.
- Algorand blockchain, HesabPay wallet, WFP, for humanitarian aid and payments in Afghanistan.

Use Cases for Financial Inclusion 2/3

Use Cases

Description

Examples

 **AgriTech** (to improve agricultural processes and outcomes)

Blockchain-based platforms aimed at enhancing **transparency and traceability in supply chains** to ensure agricultural products meet standards related to safety, quality, and sustainability.

Smart contract could automate payments to farmers when certain conditions are met, for instance, crop readiness and quality, soil quality.

- LACChain, a DLT-based blockchain supported by the IDB-Lab, has demonstrated use cases in the value chain in the region, with projects such as Agros ID, Agro Track, Circular Food Traceability.
- IBM Food Trust's blockchain solution for instance uses radio frequency identification (RFID) and IoT devices to track temperature of products and automatically uploads it to IBM Food Trust's blockchain, making the data available for anyone using it.

 **AgriWeb** (to connect stakeholders through marketplaces and digital connectivity)

Blockchain-based **marketplaces** aimed at connecting farmers directly to buyers, suppliers, and financial institutions. These platforms enable the use of digital ID for farmers, providing verifiable records of practices for safety, quality, and sustainability.

- LACChain's AgroWeb3 project that seek to develop the ecosystem of verifiable digital credentials in four countries in Latin America and the Caribbean.
- AgriDigital provides a blockchain-based platform for trading and financing of agriculture supply chains.

 **AgriFinance** (to tokenize agricultural assets and make investment accessible)

Tokenization of **agricultural assets such as farmlands, crops**, allowing fractional ownership and use of those assets as collateral. These platforms offer loans and farm insurance based on tokenized farmland or crops without the need of collaterals.

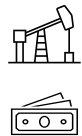
- GoldFinch Finance is a decentralized credit protocol that provides loans without requiring farmers any collateral particularly in emerging markets.
- Celo and EthicHub connects yield farmers with real world farmers, enabling access to capital without collateral. Smart contracts automate loan agreements, repayments and distribution of yields, with presence in Mexico, Brazil, and Spain.
- OneMillion Avocados combines blockchain and IoT to increase farmers production and quality in Kenya.

Use Cases for Financial Inclusion 3/3

Use Cases

Description

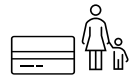
Examples



SME Financing

Blockchains technologies can provide streamlined, cost-effective, and transparent solutions for SMEs to play a role in global trade, **financing**, and cross-border **payments**. SMEs usually face high costs, delayed settlement, and barriers to financing.

- GoldFinch Finance is a decentralized credit protocol that provides loans without requiring SMEs any collateral particularly in emerging markets where trade financing is limited e.g., Southeast Asia, Africa, and Latin America. DripCapital provides financing to SMEs participating in international trade without collateral requirements. It has enabled a blockchain enabled financing solution in partnership with TradeLens.
- ImpactCred, USDC stablecoin to provide financing to SMEs in emerging markets



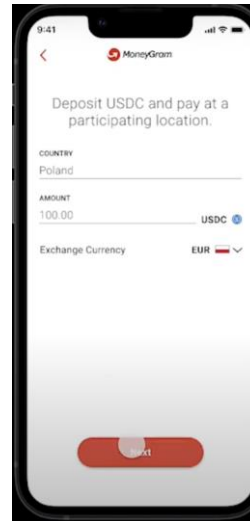
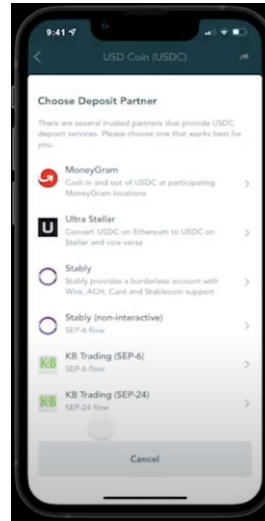
Digital ID and Verified Credentials

People can securely manage, and share verified data, enabling identity **verification**, **streamlining KYC, onboarding, and improving compliance** for financial institutions. Unlock access to government payments and healthcare, and support mobility in labor and academic markets.

- LACChain in partnership with RedClara (through LACNet) enables the tokenization of academic records, diplomas, and professional licenses.
- Blerify is a blockchain-enabled platform focused on managing self-sovereign identity (SSI) and verifiable credentials. The platform supports W3C-compliant decentralized identifiers (DIDs) and verifiable credentials, making it compatible with global identity standards. Users can own, share, and verify their identity securely without intermediaries. Blerify operates on the LACNet network.
- ID2020 Alliance is a global initiative aimed at providing portable digital IDs for underbanked populations. It uses blockchain to ensure interoperability and privacy. ID2020 has partnered with MS to create digital IDs for vaccine records for example.

Example: Cross-border remittances: on/off-ramps for cash and stablecoins 1/4

**Deposit
USDC
(cash-in)**



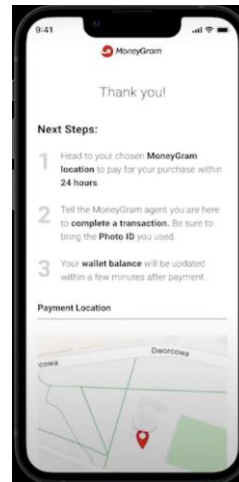
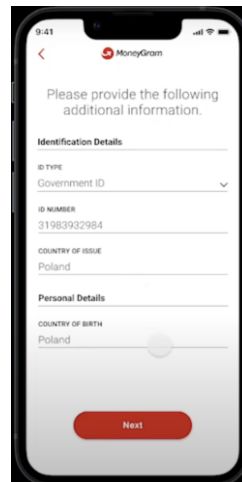
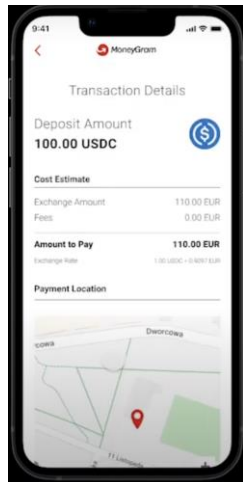
Partners: MoneyGram, Stellar blockchain, Circle USDC

Use case: on and off-ramps to stablecoins, cross-border remittances.

Target consumers: Immigrant community and unbanked population.

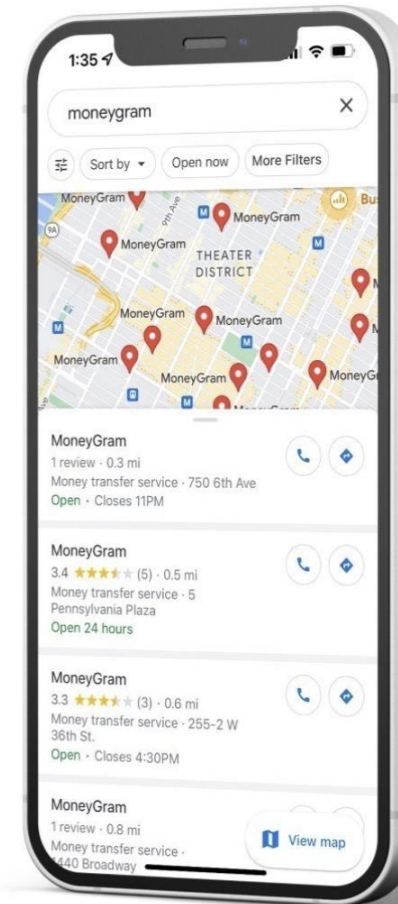
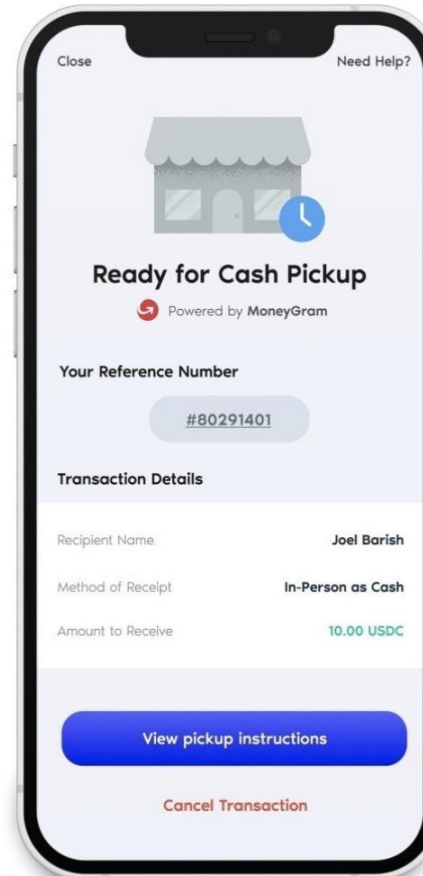
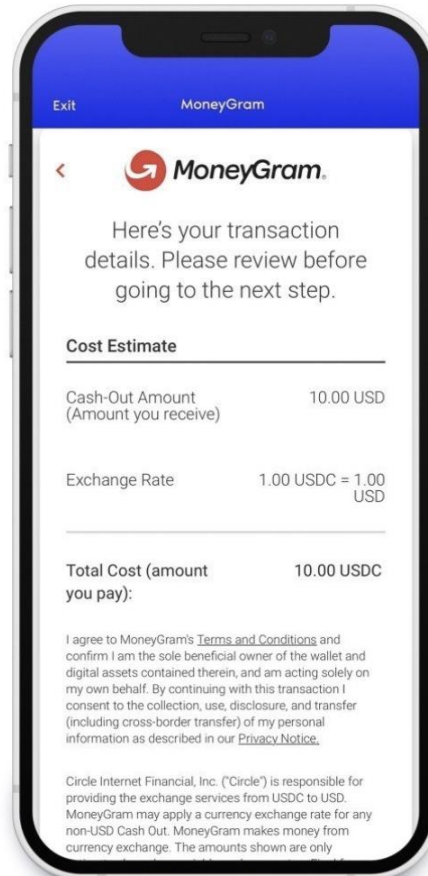
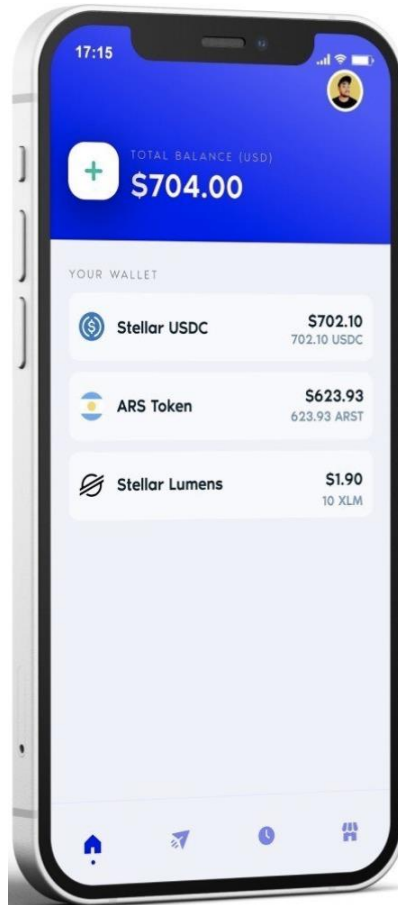
Countries: Canada, Kenya, Philippines, and US.

Launch date: July 2022

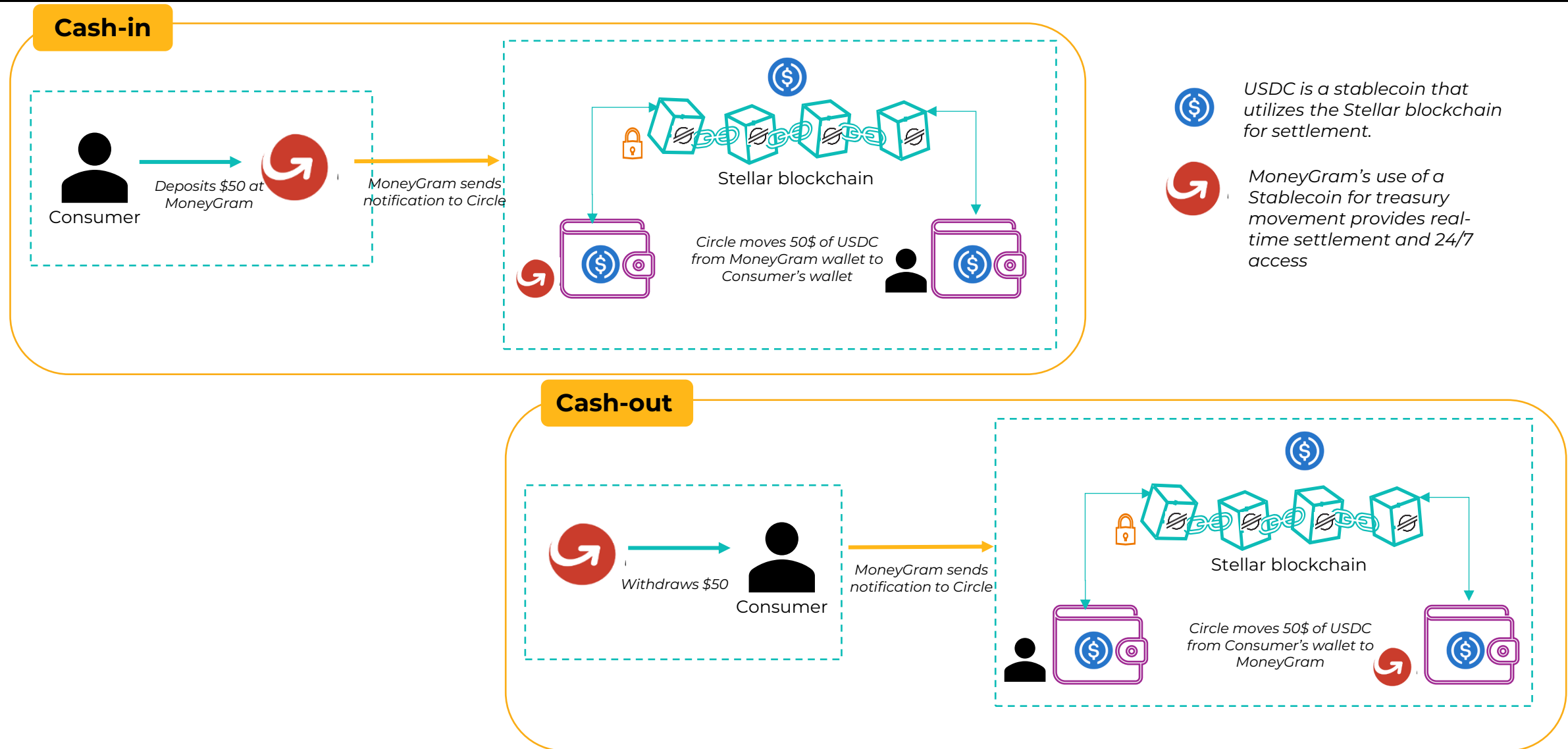


Example: Cross-border remittances: on/off-ramps for cash and stablecoins 2/4

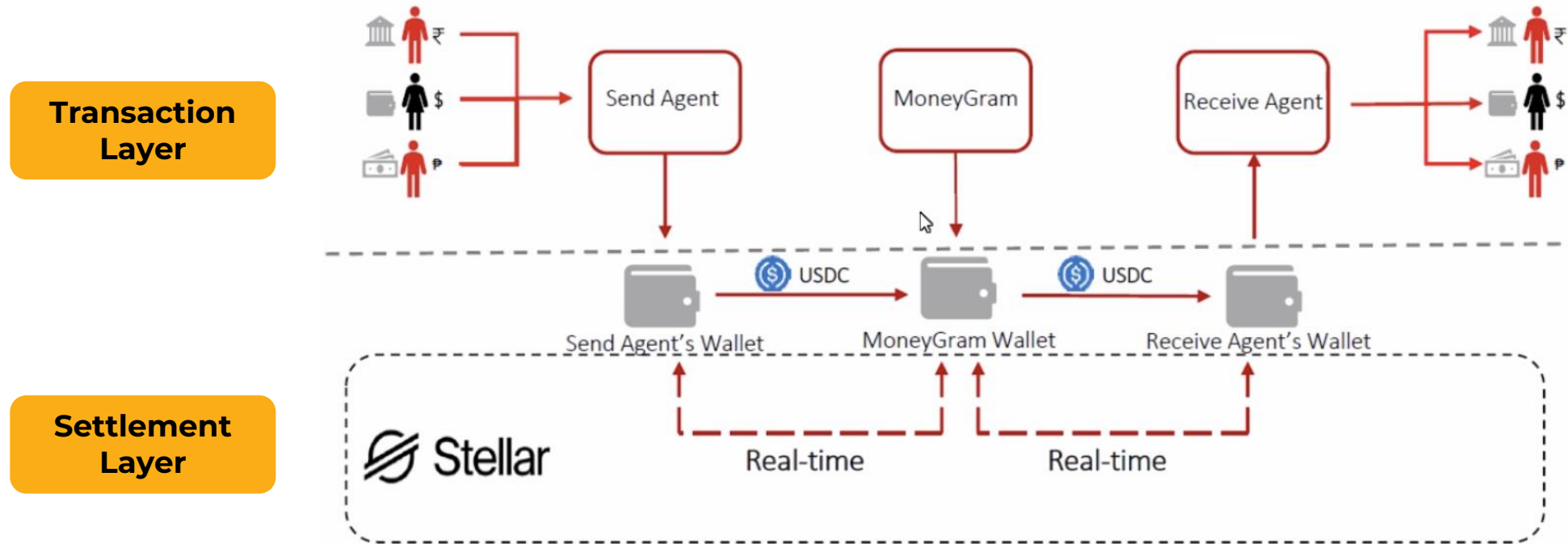
Withdraw USDC (cash-out)



Example: Cross-border remittances: on/off-ramps for cash and stablecoins 3/4

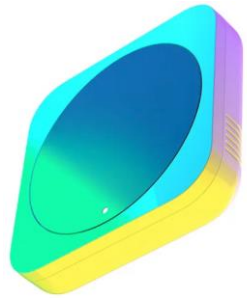


Example: Cross-border remittances: on/off-ramps for cash and stablecoins 4/4



MoneyGram uses USDC for treasury movements which provides real-time settlement and 24/7 access.

Example: Decentralized Wireless Infrastructure, Helium



Peer-to-peer wireless network for a new class of connected devices (IoT)

- Network has taken crypto principles: decentralized network infrastructure, permissionless deployment of hardware, and secured by cryptography.
- Network delivers secure, ubiquitous, and affordable wireless coverage for devices that send small quantities of data.
- ~1 million users.

Design goals and incentives:

- Decentralized blockchain, sign-in transactions and data validation.
- Align economics of hotspots around growth and usage of the network.

Use Case: Agriculture

Collecting data from automated irrigation valves, pumps, and sprayers, and relaying commands back to a cloud-based control center.



Helium blockchain



Helium
cryptocurrency
for rewarding
Hotspot hosts
(building and
maintaining the
network)

Data Credits for
users of the
network to pay
for the transfer
of data.

Decentralized blockchain networks have the potential to become the backbone of an IoT economy.



Way Forward and Call to Action

Key Takeaways 1/2

Key Pillars for the Way Forward

- Policy and Regulatory Harmonization and Support inclusive of international collaboration.
- Technology Advancement including interoperability and cross-platform functionality and asset-enablement.
- Public-private partnerships.
- Customer-centric design with seamless experience.
- Education and awareness to avoid digital exclusion.

Call to Action

- Integrate tokenization into government strategies with a focus on the use case such as G2P, identities, and access to payments and financial services.
- Invest in and support blockchain network and tokenization platforms with a focus on inclusive finance, SME and supply chain management and equitable trade.
- Partner with innovators and industry working on streamlining payments and cross-border remittances and disaster relief, and investment vehicles for underserved communities.
- Focus on the development of open-source tools and standards with a focus on scalability, security, and affordability.

Key Takeaways 2/2

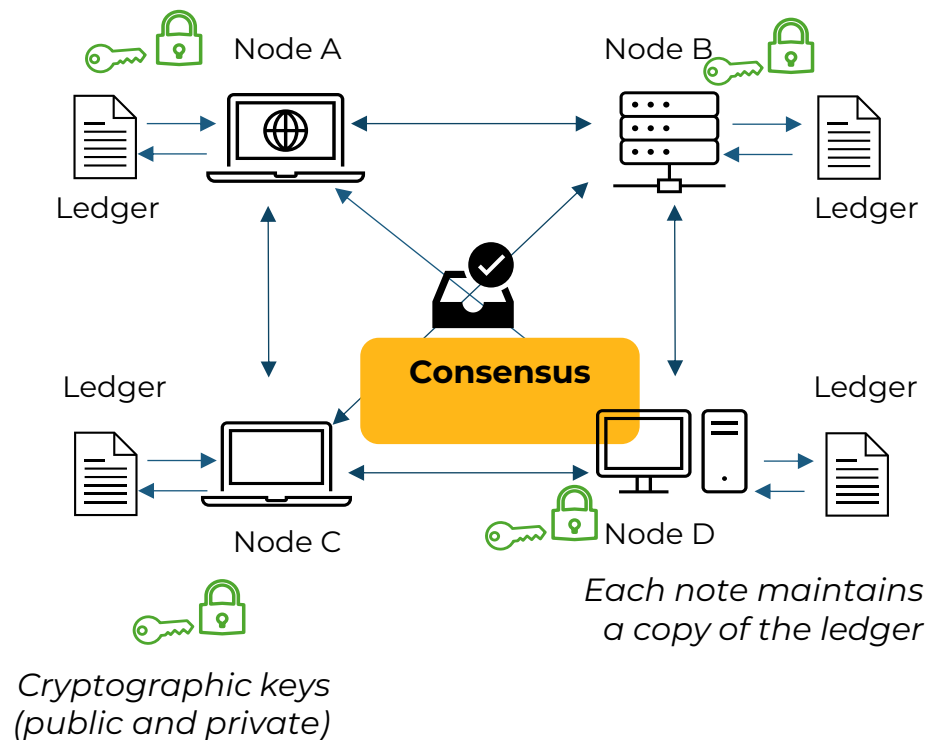
Challenges to Address

- Regulatory fragmentation, lack of standards, and clarity in some geographies.
- Technology barriers for scalability, interoperability, and affordability.
- Adoption barriers and frictionless experience as well as on/off-ramp and cash conversion limitations.
- Cybersecurity and consumer protection risks, especially in regions where financial literacy and digital protections are low.
- Data availability and impact, attribution, and scalability measurement.



Appendix: Key Concepts and Fundamentals

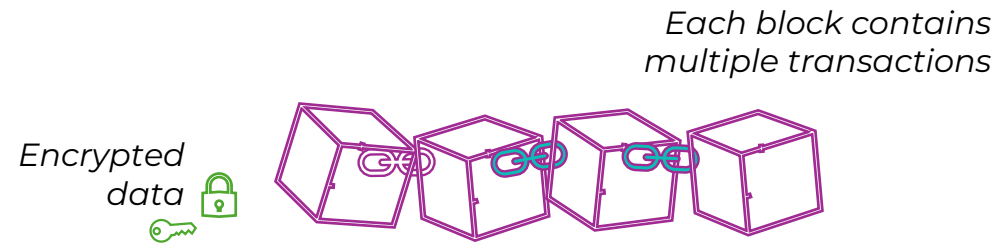
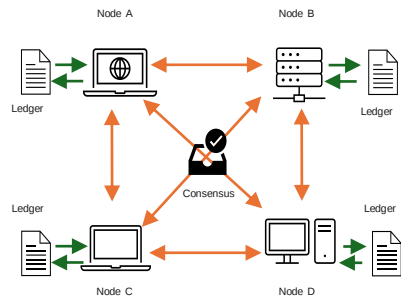
Distributed Ledger Technology (DLT)



DLT Refers to a decentralized database managed by multiple participants across multiple nodes. DLT provides a way to record data and transactions between participants in a network. This technology enables the storage, transfer, and exchange of value between users privately or privately.

-  Decentralized database.
-  Technology enables the storage, transfer, and exchange of value between users.
-  Each node records participant's balances and transactions.

Blockchain is a type of DLT



Block #	Block 1	Block 2	Block 3	Block 4
Hash	4FG67	9DSP2	5RE31	2WEO2
Previous hash	00000	4FG67	9DSP2	5RE31
Time Stamp	024-10-01 15:10:01 GMT -4	2024-10-01 17:36:41 GMT -4	2024-10-01 18:52:42 GMT -4	024-10-01 18:59:42 GMT -4
Transactions	multiple	multiple	multiple	multiple

Features

- Immutability
- Secured by cryptography
- Transparency
- Traceability
- Always-on

Types of Blockchain

- Centralized vs Decentralized
- Public, permissionless (Bitcoin for peer-to-peer transactions, Ethereum for DeFi)
- Public, permissioned (e.g., LACChain)
- Private, permissioned (e.g., Onyx, Citi, Regulated Liability Network)

