

McKinsey
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Blockchain and Digital Assets

May 2022



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Agenda



Introduction to Web 3 and Digital Assets



**Fundamentals of Blockchain,
Digital Assets and Smart Contracts**



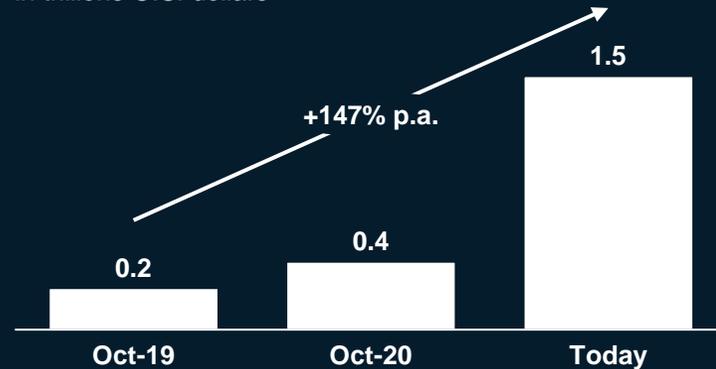
**Commercial Applications of Web 3
Technologies**

The market for digital assets has grown over the past few years...

As of May 2022

Crypto market exceeds US\$1.5 trillion

Market cap, global crypto market¹
in trillions U.S. dollars



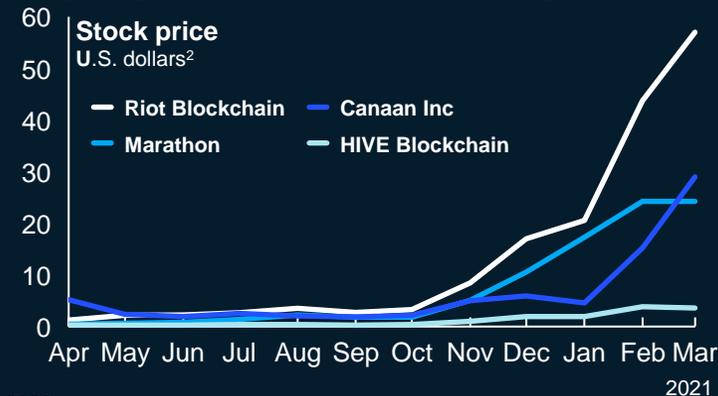
Large volumes of NFTs collections

Collection	Volume	Traders	Sales
1 Meebits, ETH	\$7.5Bn	10k	24k
2 Axie Infinity, ETH	\$4.2Bn	2.0M	15M
3 CryptoPunks, ETH	\$2.7B	6k	21k
6 ArtBlocks, ETH	\$1.2B	38k	156k
9 NBA Top Shot, Flow	\$885M	535k	16M

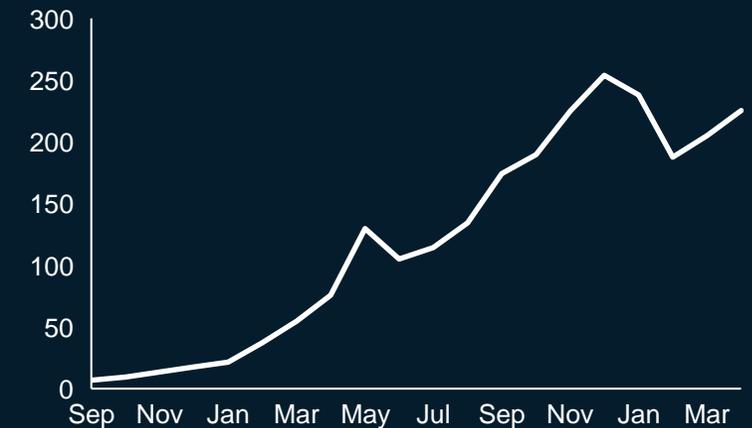
Stablecoin circulation: ~\$180B in value

Stablecoin	Parent company	Value in circulation	30d txn volume
Tether	Bitfinex	\$80B	\$2Tn
USDC	Coinbase	\$50B	\$120B
DAI	Maker Foundation	\$9B	>\$20B
Other	Binance USD, Gemini USD,	>\$40B	>\$200B

Rapid growth of bitcoin mining stocks



DeFi TVL³ up 30x in last 18 months, \$Bn



Significant value at stake

>\$20B estimated 2021 revenue of crypto exchanges

~\$300B estimated combined valuation of crypto exchanges globally (valued >15x revenue)

>\$20B valuation (within 24 months) for crypto derivative exchange

1. Based on midday 21 February data read (for 2019, 2020 respectively) and May 2022
2. Taken at 1st day of each calendar month 3. Total Value Locked. Note all \$ values in USD

...and Digital assets achieved scale in 2021



300M

people own crypto worldwide, with more than 1 in 7 Americans owning digital assets



\$1.5Tn

combined crypto MarketCap. Total Value Locked in DeFi stands at more than \$250Bn



\$70Bn

Coinbase digital assets exchange worth 2x largest electronic exchange, almost \$8Bn revenues in 2021



\$8Bn

DeFi exchanges are processing more than \$8Bn in daily volume (\$10M daily revenues)



\$1.7Tn

in Stablecoin on-chain volume in Q2 2021 similar to Visa's volumes



\$180Bn

stablecoins currently in circulation, with velocity of money up to 1 per day



\$25Bn

Total volume of NFT sales in 2021 (compared to just \$95M in the year before)



\$30Bn

PE and VC funds invested \$33Bn in Crypto and Blockchain deals in 2021

We are seeing the start of a new wave of innovation changing how we interact with digital services & traditional value chains

Web 1.0

1980s – early 2000s

Decentralized

Read

Web 2.0

Mid 2000s – present

Centralized

Read & Write

Web 3.0

Future

Decentralized

Read, Write & Own

Series of open protocols that anyone could build on top of (e.g., SMS for messaging, HTTP for websites)

Stateless (e.g., did not capture any user data or state), very technical and with limited functionality

No monetary incentives for protocol creators to innovate

Companies recognize Web 1.0 pain points and build products and services that vastly outpace the capabilities of open protocols

Emergence of state aggregators, aggregating valuable user data and making it easy to anyone to participate on the Web

Users migrate from open services & protocols to more sophisticated centralized services

Resurgence of open standards & protocols tied to monetary incentives driving open innovation

Disintermediation of large platforms and aggregators through community-governed, decentralized networks (i.e., DAOs)

Shift in data ownership from aggregators to users, changing the digital value chain

SMS **HTTP** **SMTP** **FTP**
Messaging Webpages Email File Transfer



Web3 Applications and use cases are built on top of 3 technology primitives: Blockchain, Smart Contracts & Digital Assets

Illustrative

Simplified

Web3 Applications & Use Cases

④



Applications & use cases built on top of the Web3 primitives. The connection of these virtual experiences is sometimes referred to as **metaverse**

Web3 Primitives

③

Digital Assets & Tokens

Assets that exist digitally, including cryptocurrencies, digital stocks, stablecoins, digital collectables, etc

②

Smart Contracts

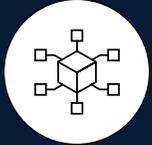
Code or programs stored on a blockchain that execute when conditions are met (e.g., terms between a buyer and a seller), governed by DAO

①

Blockchain

Digitally distributed, decentralized, public ledger that exists across a network and facilitates the recording of transactions

Agenda



Introduction to Web 3 and Digital Assets



**Fundamentals of Blockchain,
Digital Assets and Smart Contracts**



Commercial Applications of Web 3
Technologies

Blockchain

What is it?

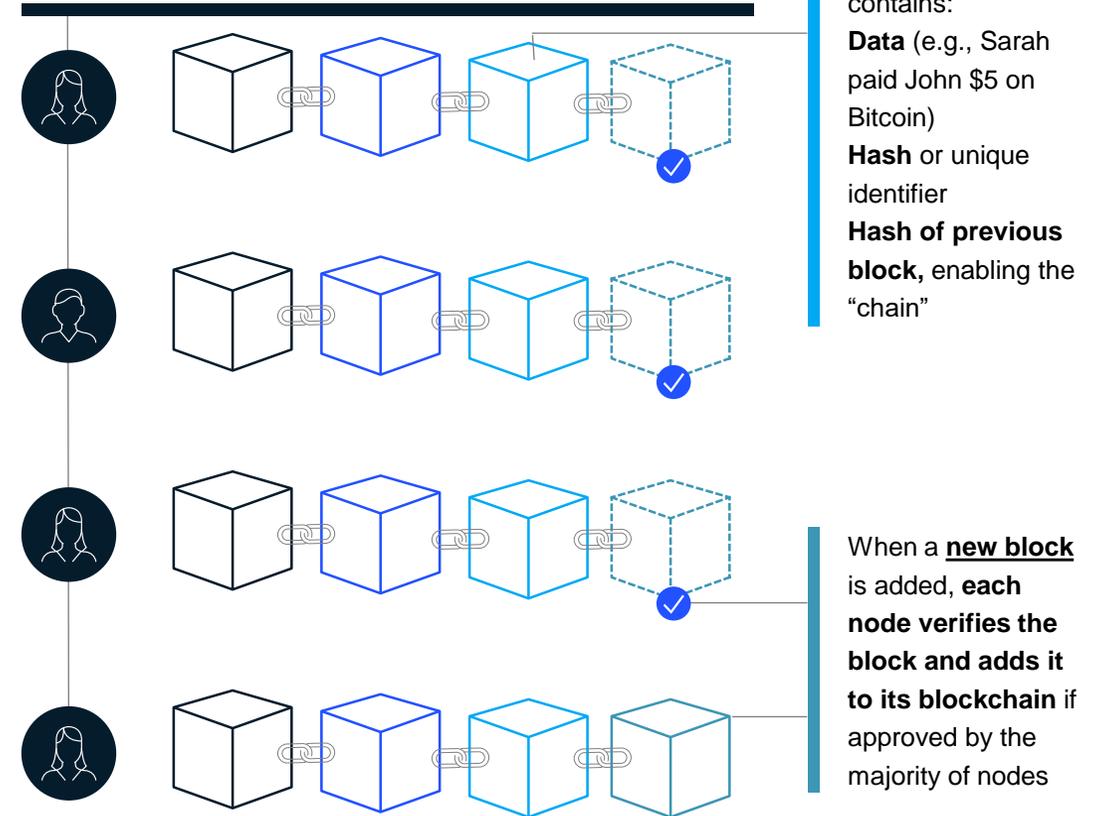
A Blockchain is a **digital ledger** or database of **transactions that is duplicated and distributed across an entire network** of computer systems on the blockchain— these computers are called nodes

The ledger is made up of a **chain of individual blocks of data. As new data is added to the network, a new block is created and attached to the chain.** All nodes are then updated to reflect the blockchain ledger identically

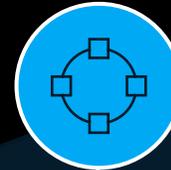
A majority of nodes must verify and confirm the legitimacy of the new data before a new block can be added to the ledger

Illustrative

The blockchain network is made up of **nodes** or the individuals who each have a copy of the ledger



A blockchain is...



On a **peer-to-peer network** made up of multiple computers that hold an identical copy of ledger transactions

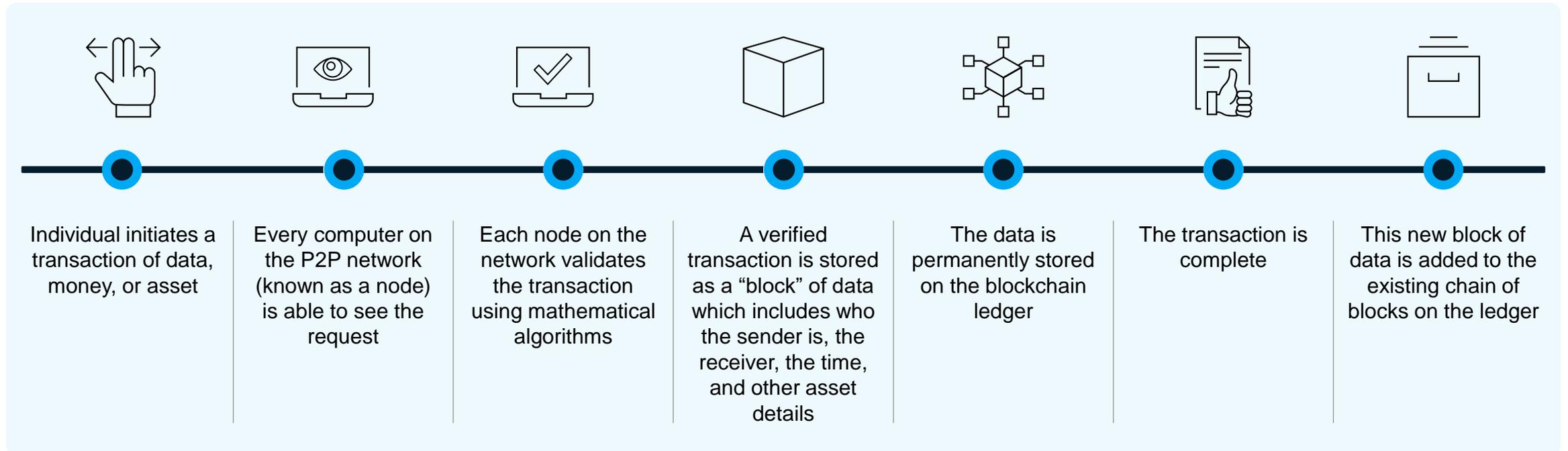
Fully encrypted and it records and broadcasts any changes or updates made to data to the blockchain

Decentralized, meaning that there is no central, certifying authority or intermediary that is in charge

Flexible and can be used for storage and transfer of currency, contracts, records, and other kinds of data

Blockchain technology can serve as the backbone for digital transactions involving exchange in currencies, data, or assets

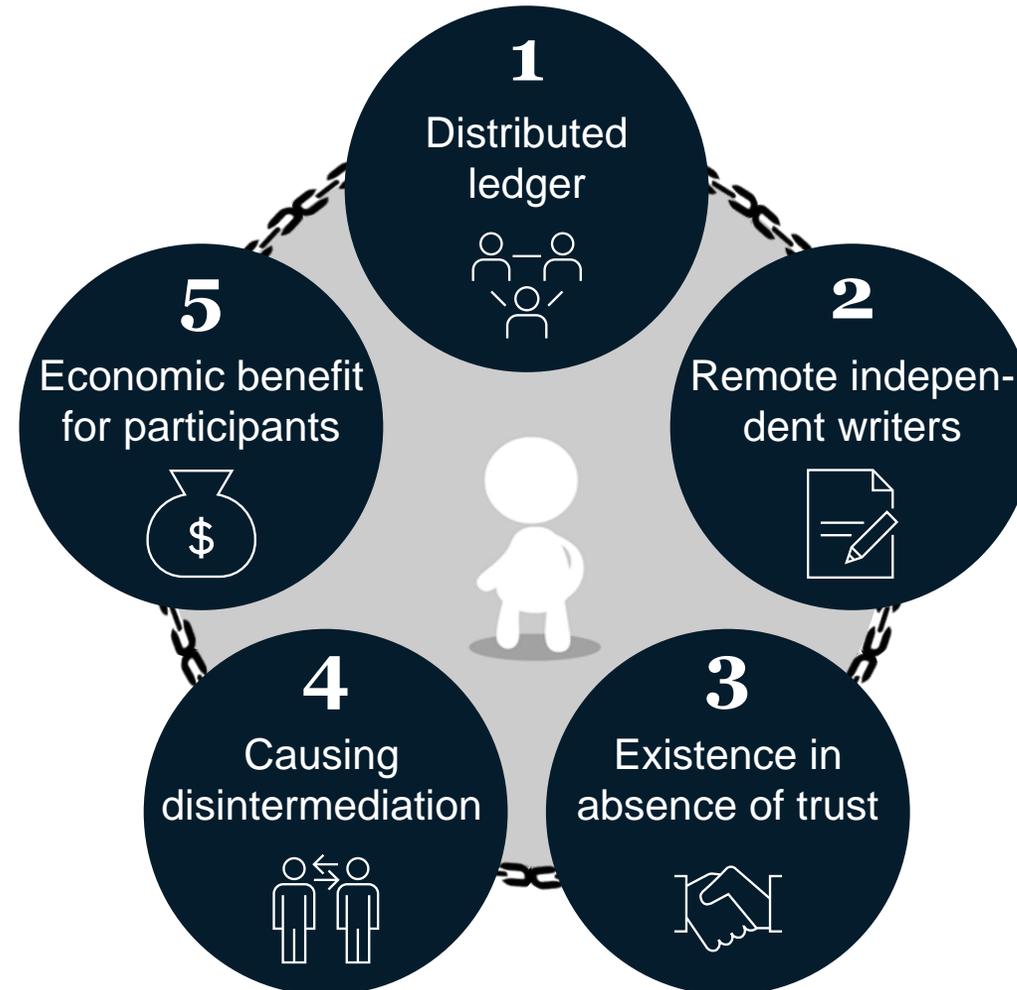
Blockchain records and stores data, documents, transactions, and digital assets. Data on blockchain is recorded in real time and stored on a transparent, immutable and encrypted ledger



[Click here](#) to watch a short video explaining the basics of Blockchain

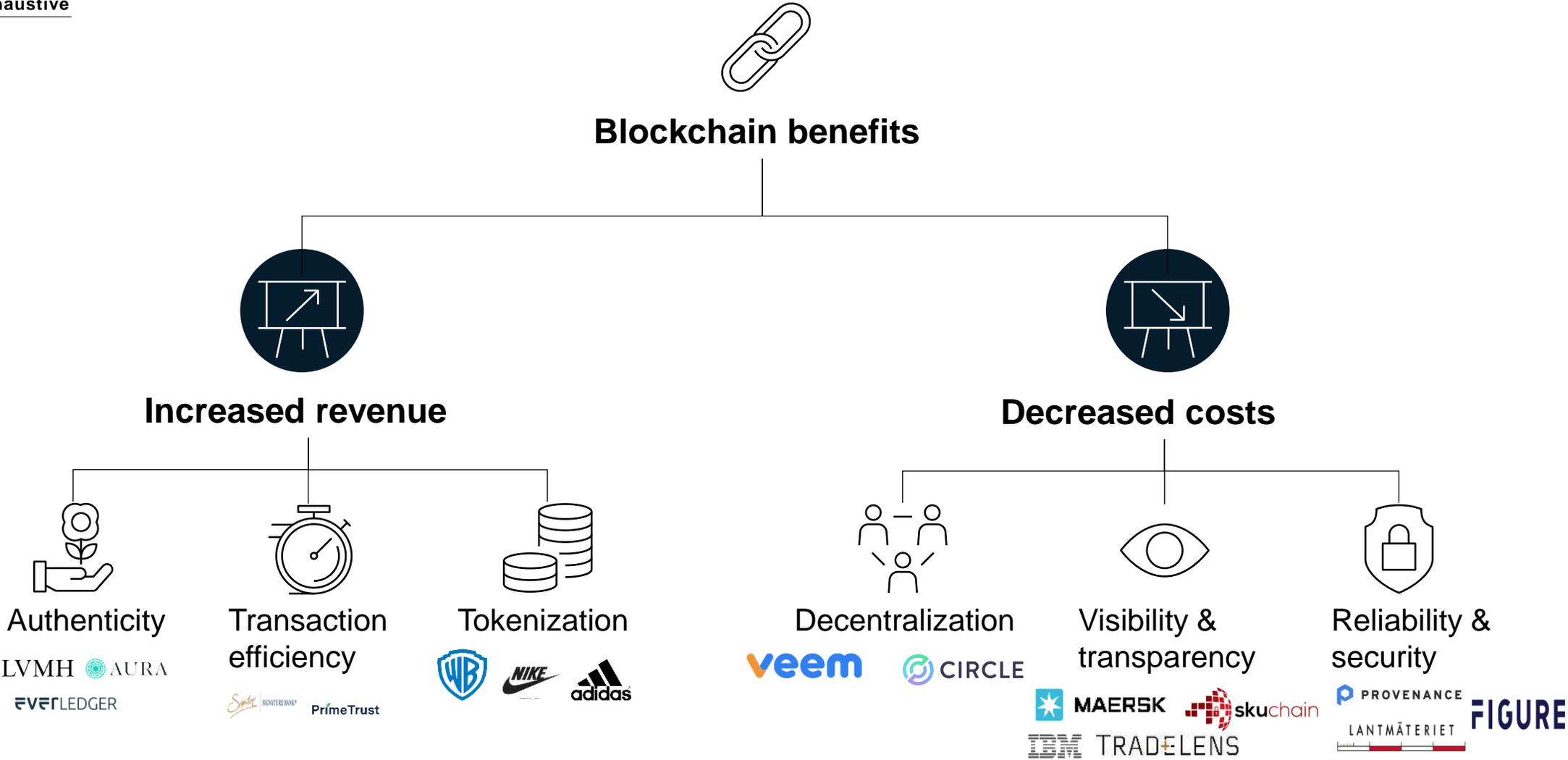
However, blockchain technology is not a silver bullet and should be employed only under certain conditions

5 key criteria for choosing appropriate blockchain applications



Blockchain can add value through driving increased revenue and reducing costs

Non-exhaustive



Source: Press search, company websites

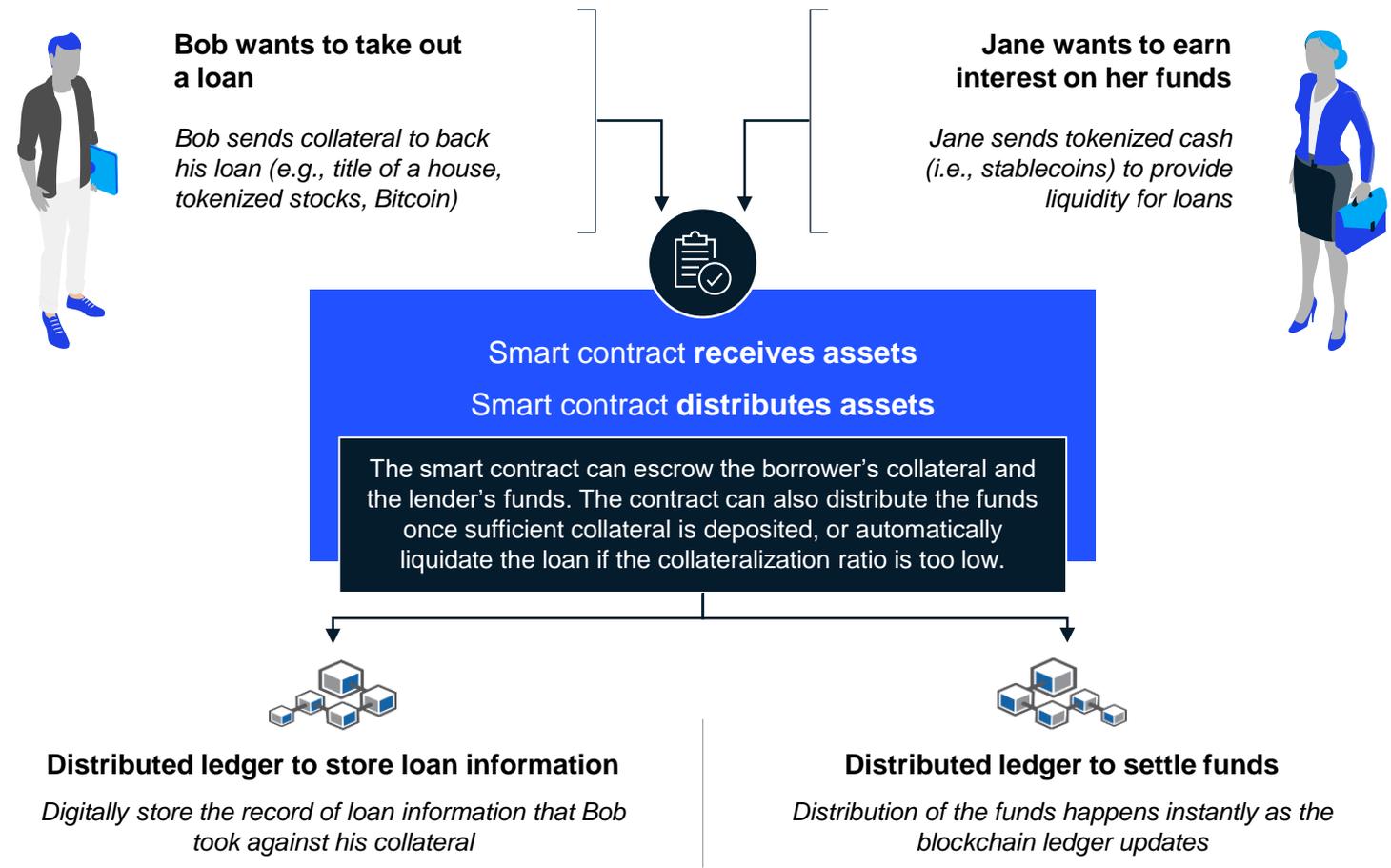
Smart contracts

What is it?

A smart contract is a computer protocol intended to digitally facilitate, verify, or enforce the negotiation or performance of a contract

- Smart contracts are **written as code and stored on the blockchain**; the code and its conditions are publicly available on the ledger
- **An event triggers the execution of coded terms** in the contract (e.g., target price reached, date expired)
- **Assets are released to the necessary parties**, both parties remain anonymous throughout
- **Regulators are able to review the immutable transaction records** to understand and investigate activity

How do Smart Contracts work?



Click [here](#) to watch a short video explaining the basics of Smart Contracts

Powered by blockchain, smart contracts offer an automatized, secure solution for executing tasks

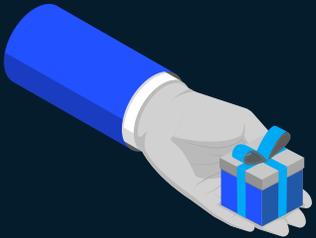
1		Security	Blockchain allows smart contracts to be fully encrypted
2		Speed	Tasks are automated using code, saving time on timely processes
3		Accuracy	Use of tech results in elimination of human errors (e.g., manual forms)
4		Risk & autonomy	By eliminating need for intermediaries, third part risk is mitigated
5		Cost savings	Autonomy and elimination of brokers leads to savings
6		Back-up	Documents are stored and duplicated on the blockchain, thus originals can be easily restored

Potential use cases of smart contracts

- Real estate transactions (e.g., escrow, title, mortgages)
- Trade finance (e.g., international trade)
- Supply chain management
- Government (e.g., payments)
- Insurance (e.g., processing claims)
- Financial services

Digital assets are tokens of value created on a blockchain

Native tokens



New crypto tokens are created each block as reward for the computer servers maintaining the blockchain network

Value transfer



These tokens (e.g., Bitcoin, Ether, Solana) then become units of value for transactions recorded on the blockchain

Transaction fees



Transaction fees are paid to server operators (nodes) for adding transactions to the blockchain, with prices set by market demand

Token allocation



Blockchains typically define their token allocation at launch, with significant variability in allocation to the founders, investors, and the public

Five types of digital assets can be issued on a blockchain

Assets

Description

Native tokens

These tokens are typically issued every time a new block of transactions is added to the blockchain (ledger) and function as the native reward currency paid to the operators of the blockchain servers (nodes). Tokens are fully fungible and highly divisible to tiny fractions



Stablecoins & CBDCs

Tokenized cash, typically issued on a blockchain but pegged to the value of a real-world asset. The asset could be fiat currency deposited every time a token is minted, tangible assets (e.g., gold, commodities), or controlled algorithmically to match token supply to demand



Governance tokens

Tokens issued to investors to enable democratic voting on decisions pertaining to the blockchain or associated enterprise. Parties owning sufficient tokens can propose changes; all governance token holders can vote; votes and their outcome are recorded on the blockchain



Non Fungible Tokens (NFTs)

Uniquely identifiable and provably scarce tokens that are the digital representation of any asset (e.g., digital media, art, music gaming items). Their properties or contingent actions can be programmed into the token itself via a smart contract



Tokenized real world assets

Tokens that represent any real-world asset recorded as a digital-twin on a blockchain (e.g., equities, bonds, real estate, carbon credits). These tokens can then be fractionalized and traded in new marketplaces and used as collateral in smart contracts (e.g., DeFi lending)



In many countries, ten percent of adults are actively engaged in, or exposed to digital assets

Preliminary

xx% Penetration in core demographic Key focus of the survey



Core demographic (respondents)
All aged 18+ and active online

Overall				
36,233	15,207	8,404	9,049	3,573

Of which: Engaged in digital assets
All those who are involved in trading or transacting or holding digital assets

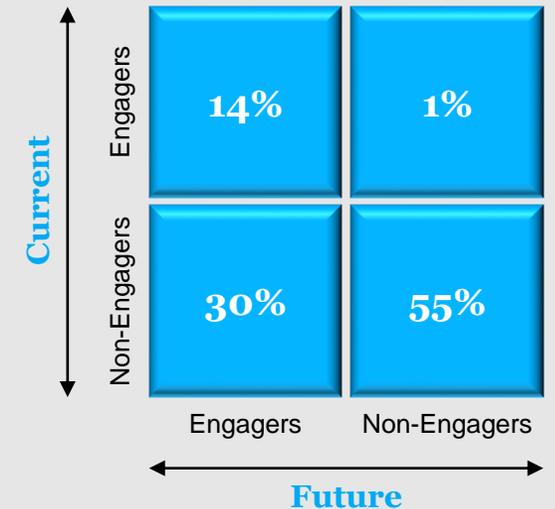
15%	10%	15%	20%	21%
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Of which: Active in digital asset investment decision making
All engagers actively involved in decision making, solely or jointly, on digital asset investments

10%	7%	12%	12%	15%
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In addition, ~30% of current non-engagers plan to enter the space in the next 12 months

Split of Respondents by Current & Future Engagement



Misconceptions have continued to circulate over recent years



Crypto perceptions

- A *“Crypto assets are mostly used to launder money and pay for products & services on the dark web”*
- B *“Cryptocurrencies frequently get hacked”*
- C *“Crypto is a scam with no real use cases; it’s a ponzi that is all about riding the bubble”*
- D *“Bitcoin mining is an environmental disaster because of its electricity usage”*

vs.



Crypto realities

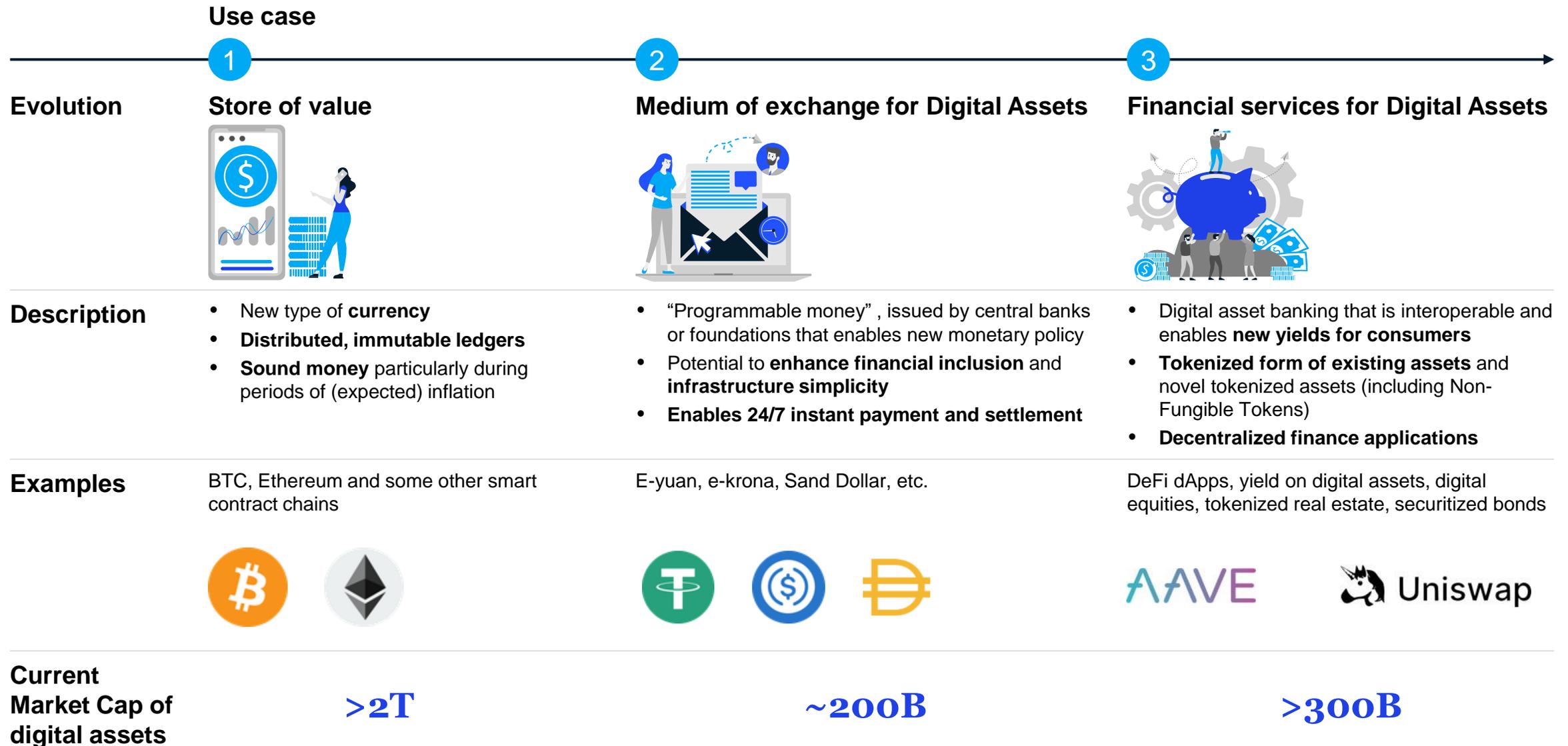
Studies have shown 0.3% of crypto transactions can be linked to potential money laundering (compared to 2-5% of GDP); **Bitcoin is not well-suited for money laundering due to its public nature**; privacy coins are not listed on some US exchanges e.g., Coinbase

Risk in the crypto ecosystem is limited to human interactions – **technology is highly reliable**: (i) 0 hacks of the bitcoin blockchain; (ii) network has had 100% uptime since inception; (iii) code is fully open-source

Bitcoin is augmenting gold as a store of value; **real underlying innovation and use cases** (e.g., decentralized finance) **are gaining traction**

>50% of **mining is performed in regions with excess electricity** supply, based on renewables, and >75% of miners use renewables as part of their energy mix

Digital asset use cases may evolve over time and co-exist at scale as they become increasingly prevalent in financial services



Non-fungible tokens – what are they?

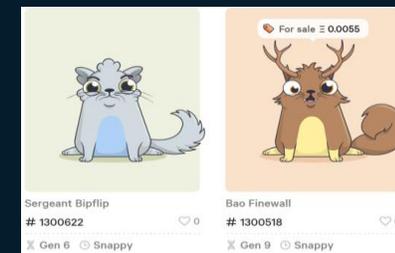
Easily exchangeable, individually unique and provably scarce digital assets ensuring **true ownership via a smart contract**

Validated and held on certain blockchains (mainly Ethereum, but also Flow, Wax, etc.)

Not only exist in a digital space but **they can also represent any type of physical asset**, acting as a “digital twin” to anything existing in the real world, enabling the ownership and exchange of physical possessions within digital marketplaces

First NFT was developed in 2017

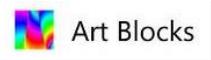
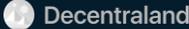
Selected examples



NFTs enable ownership of digital goods and can change the distribution and revenue model: Music example

	Physical world	Digital disruptor	NFT Case
Digital asset ownership	Incumbent record label owns music rights	Distributor (streaming service) makes the profit on subscription fees	Musicians own music rights
Structure	Music is only available on physical good	Music is available in digital form, Music is streamed by users	Music is available in NFT form – Music can be owned or streamed by users
Consumer ownership	Consumer buys album from record label and owns it	Consumer streams music, but does not own it	Consumer can own digital music files or part of the music rights
Revenue capture	Album sales revenue	Monthly subscriber fees	File sales, perpetual royalties from file re-sales
Example			

Use cases for NFTs have proliferated across industries

	Key value proposition	Stakeholders involved	Examples
Digital art	Selling artwork in digital form directly to a global audience of buyers, possibly without using an auction house or gallery	Artists, collectors, galleries, art dealers, auction houses, museums	 
Sports	Sports video (short clips) and non-video (cards, collectibles) content that users can buy, trade and use to compete for prizes	Sports teams, athletes, sponsors, sports fans	
Music	Limited edition content, ticketed virtual meets, digital experiences, artist engagement and collectibles. Artists can receive streaming and merch royalties instantaneously	Music artists, record labels, music publishers, streaming platforms, music fans	
Real Estate	Virtual land ownership; properties can be fractionalized into multiple assets that can be purchased by investors on a blockchain-based peer-to-peer exchange	Real Estate companies, property management companies, investors, property owners	 
Gaming	Allows players to trade in-game collectibles securely while providing authenticity and validation to the players in a secure ecosystem; unlock additional experiences with NFT ownership	Game developers, gaming marketplaces, gamers, distributors	 
Finance	NFTs are used as collateral for loans, where the lender is a protocol of smart contracts offering borrowers fast access to liquidity in the form of cryptocurrency	Financial markets, banks, fintechs, governments, consumers	

We see three emerging trends across all applications of NFTs

	Theme	Sub-theme	Description
	Provenance	Establishing provenance for a digital object	Enabling a valuation of a digital asset by characterizing its authorship and originality, whilst establishing methods for its ownership, distribution and control remains highly complex
	Content	Growth in number of use cases	Growing number of use cases across media types with growing questions around legal framework to manage embedded IP
		Growth in volume and value of NFTs	Significant growth of e-commerce transactions with highest expenditure on metaverses, gaming, sports and art in the US, Canada and the UK
		Growth in number of marketplaces	Increased funding from institutional investors driving growth in general and specialized marketplaces (e.g., Opensea, Lazy.com)
	Experiences	Physical and digital convergence	Increased sale of NFT products, which combine digital and physical products as collectibles by premium brands (e.g., Louis Vuitton, Nike) and unique, personalized experiences with 'stars'

Agenda



Introduction to Web 3 and Digital Assets



Fundamentals of Blockchain,
Digital Assets and Smart Contracts

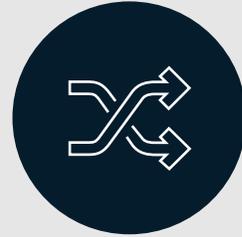


**Commercial Applications of Web
3 Technologies**

Valuable proven applications of blockchain include trade finance, supply chain, digital identity, public records access and financial services (not exhaustive)



Supply chain
finance



Food safety
track & trace



Public data
security



Certificate of
provenance



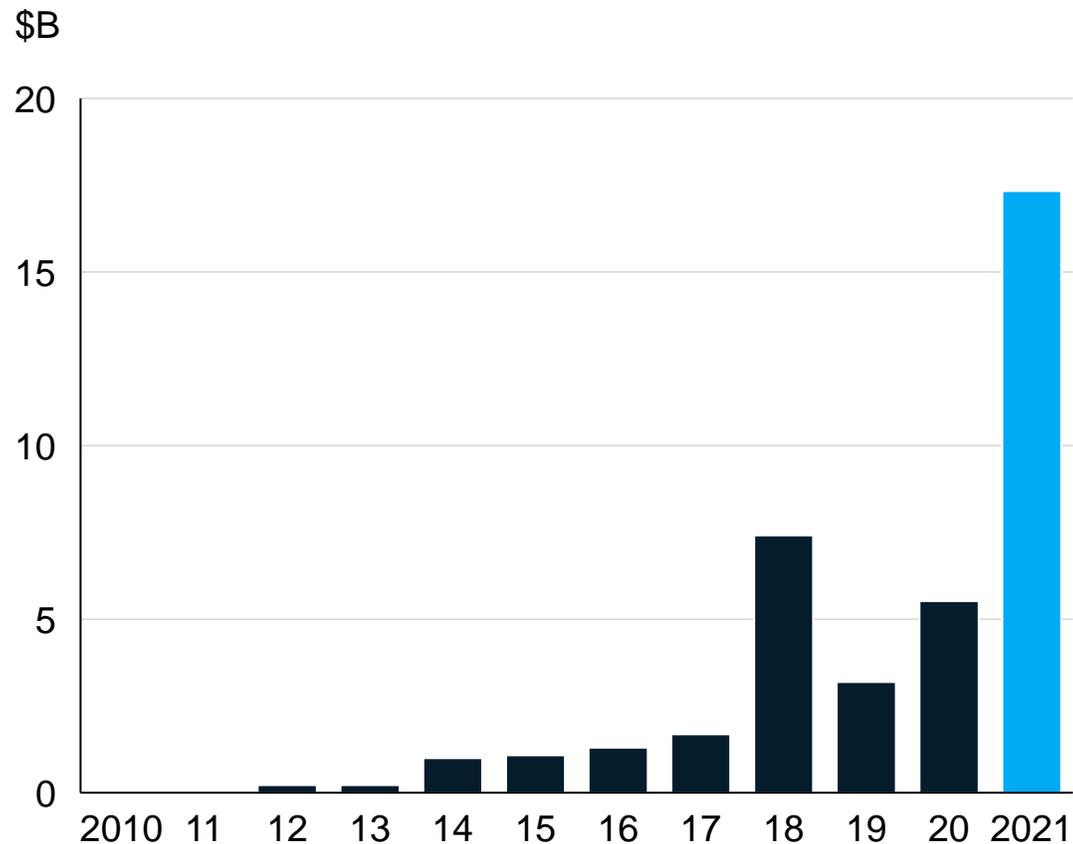
Ownership
tokens



Health Info
Exchanges

VCs invested significantly in Blockchain in the last few years

Venture capital investments in DLT in USD bn



Source: PitchBook

With most investments made in financial infrastructure

Entity	Close date	Deal size \$M
Bullish	2021-05-11	10,000
Ledger	2021-06-10	380
BlockFi	2021-03-11	350
Dapper	2021-03-30	350
PAXOS	2021-04-29	300
Blockchain	2021-03-24	300
Bitso	2021-05-05	250
FIGURE	2021-05-20	200
FORTE	2021-05-20	185

Incumbent logistics players are leveraging blockchain to gain market position – for example, Maersk / IBM / TradeLens

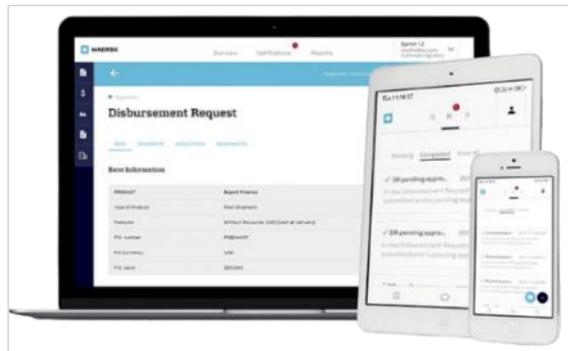
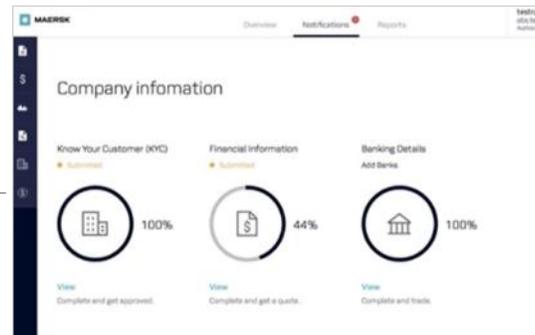
Supply Chain finance example



Maersk: From digital attacker in trade finance...

Fully digital trade finance solutions paired with traditional logistics and shipping capabilities

Financing for pre and post-shipment operations, both for import and export activities

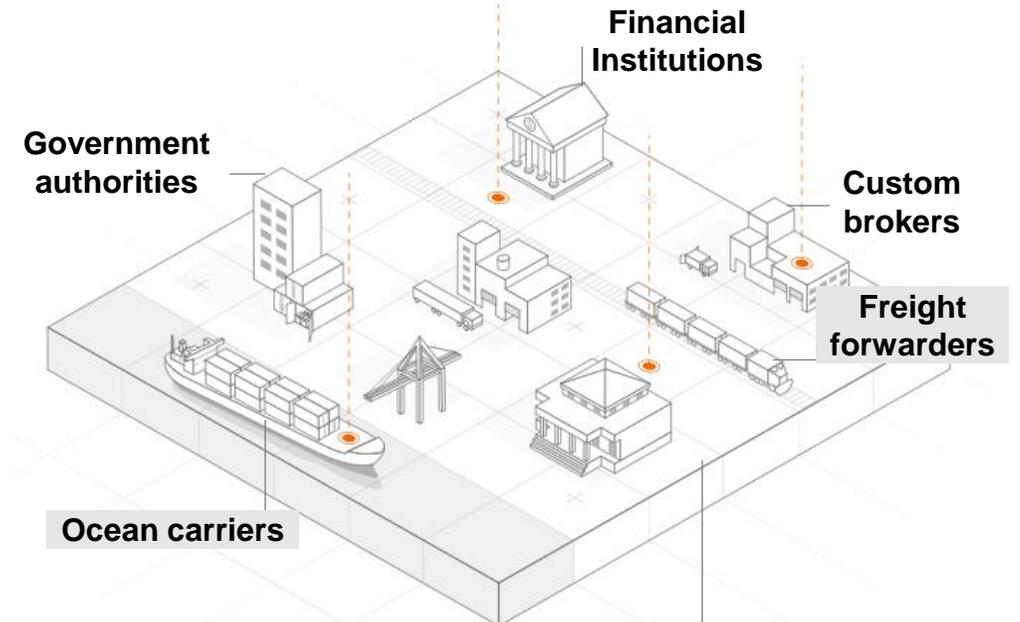


Fully digital platform allowing an E2E digital process of credit evaluation, KYC and real time shipment tracking



...to promoter of a fully blockchain-based logistics ecosystem

Maersk partnered with Tradelens and IBM to offer real time, blockchain powered tracking and optimization of the supply chain via event tracking and distributed document sharing



Opening of the ecosystem to third party software developers to build Trade Finance applications leveraging the shared data

The automobile industry has focused on vehicle compliance

Compliance example

Context

- In 2018, Renault launched XCEED, a **distributed ledger technology (DLT) solution**, intended to **serve a supply chain network ecosystem for industry-wide compliance certification**
- XCEED blockchain has been tested with **45 suppliers** and integrated with **2 other European OEMs**
- **Proof of concept** was a **success** and resulted in an ambition to **industrialize the solution**
- The platform will move **day-to-day manufacturing activity data into DLT**, enabling a **faster audit process**. Data to be submitted to XCEED blockchain include safety, compliance, software and geometry
- Other technologies such as **IOT will be leveraged** in the industrialized solution (e.g., data coming from spare parts electronic chips, from autonomous cars)
- Current **operating model** with stakeholders (IBM, Renault & 12 suppliers) is based on **co-innovation contracts** with the ambition of moving into a consortium mode

Recent progress

- As of April 2021, the XCEED blockchain solution to certify the compliance of a vehicle's components from design to production is now being implemented at scale
- XCEED uses Hyperledger Fabric blockchain in a Hybrid Cloud to create a trusted network for sharing compliance information between parts/systems manufacturers, throughout the supply chain to end vehicle manufacturers
- The shared solution enables tracing of the compliance of parts assembled in a vehicle in almost real-time and has already been piloted successfully at Renault's Douai plant
- It is now due to be piloted at partners' plants in Turkey, Spain and France and is open for trial to global OEMs and suppliers throughout the supply chain
- The ultimate ambition of XCEED is to provide a compliance and conformity traceability platform for the entire European automotive industry ecosystem, satisfying both regulatory and customer demands

The Aura Blockchain Consortium: track & trace solution for luxury goods industry

Track & Trace example



AURA

LVMH

PRADA

RICHEMONT

The Aura Blockchain Consortium is a **non-profit, collaborative industry initiative** employing a single, universal, private blockchain solution for product traceability in the luxury sector

Its goal is to **enhance customer service** by enabling consumers to **access details of a luxury product's entire supply chain**, its product **history** and **authenticity**

The Consortium operates the technology hub and platform which is **accessible to all partners, irrespective of size**, but has flexibility to deliver on needs of individual brands

The founding group comprises LVMH, Prada and Richemont, representing the founding brands Louis Vuitton, Prada, Cartier, Bulgari, and Hublot

Members pay licensing fees and a fixed fee per product to track & trace any product with an NFT, attached to the product through a QR code or RFID tag

Progress

Unveiled consortium of luxury brand early founding members on April 20, 2021

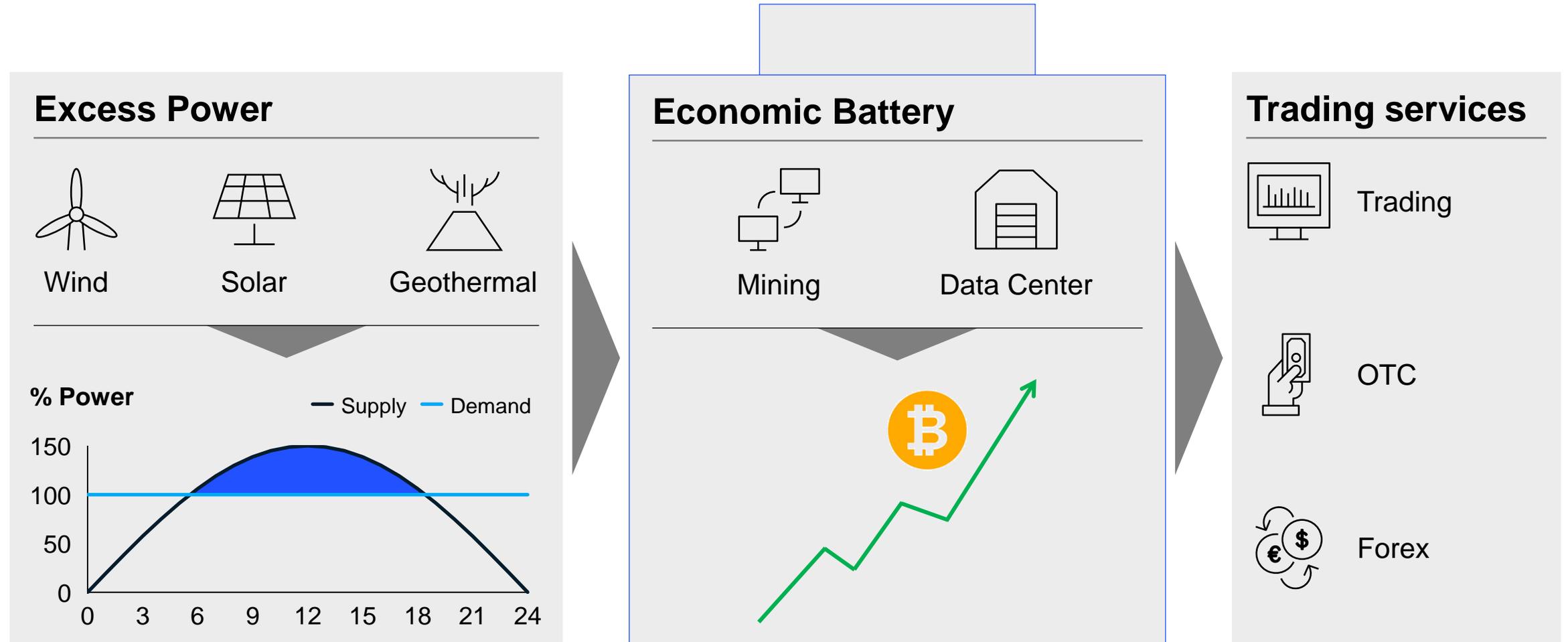
Utilizes a multi-nodal private permissioned blockchain (based on JP Morgan's Quorum/Enterprise Ethereum and using ERC-721 standard for NFTs), secured by ConsenSys technology and Microsoft, to control the access to secure data

Each brand has developed its own product specificities and will continue to fully own and be responsible for its data while respecting customer privacy standards to avoid exchange of competitor data

Hublot launched a digital e-warranty stored in the Aura blockchain to enable customers to verify the authenticity of their watch

Goal is to attract additional prestigious and luxury brands to join the platform with the Consortium founders

Proof Of Work Bitcoin Mining can operate as a Load-Balancing Economic Battery

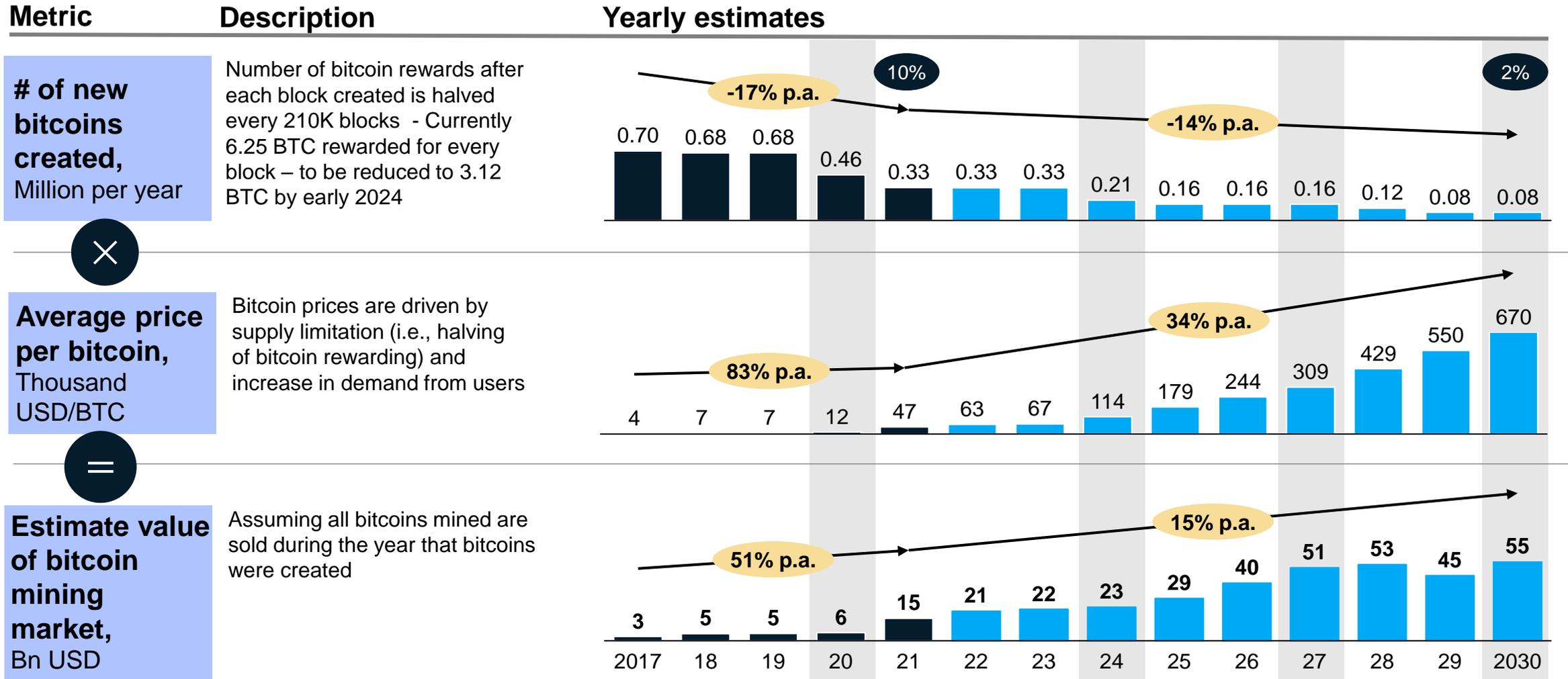


Bitcoin mining alone today is estimated >15 Bn USD

– with potential to 3-4X growth by 2030

PRELIMINARY

HIGH LEVEL CONSERVATIVE ESTIMATION



Note: Average yearly price estimates are based on lookintobitcoin.com / Philip Swift estimates till 2027. Historically estimates of lookintobitcoin vs actual average bitcoin prices are adjusted by 80% as conservative assumption

Beyond supply chain track & trace, blockchain and digital assets may also impact consumer goods across three core functions



Accepting Payments

Enable purchases via multiple currencies, including payment from non-custodial browser digital wallets

- **If adoption of digital assets continues** : financial service infrastructure providers are preparing to offer wallet, custody and on-chain settlement services to merchants and consumers, enabling borderless multi-currency transactions



Minting Rewards

Issuance of digital asset tokens as rewards for customer loyalty, redeemable in digitally-native ecosystem

- **If utility of digital assets expands** : consumer brands will utilize proprietary digital tokens to incentivize, reward and gamify consumer behaviors, including new purchases, broader loyalty and wider ecosystem engagement



Metaverse Engagement

Creation of venues and exclusive experiences in blockchain-enabled VR metaverse as a new engagement channel

- **If engagement with the metaverse continues** : consumer brands will employ metaverse venues as a new channel for customer acquisition and engagement, offering unique digital experiences as reward for deeper loyalty

Leading brands have shown that NFTs can be used to engage consumers



Coca-Cola auctioned a Friendship Box with 4 NFTs



Clinique launched first 3 NFTs



Stella Artois sold 50 NFTs

Description

Coca-Cola auctioned a “Friendship Box” incl. 4 NFTs (e.g., a Coca-Cola Bubble Jacket)

The winning bidder also received a physical, fully stocked Coca-Cola refrigerator



Clinique launched a social media reward campaign in October 2021, targeting the brand’s existing users with the goal of bringing them into the digital space. **The company is using their first 3 NFTs as prizes.** The winners also receive an assortment of products once a year over the next decade



Beer maker Stella Artois sold **50 horse NFTs** that could subsequently race in the metaverse game Zed Run. Stella Artois also **unveiled a branded 3D racetrack** to be raced on within Zed Run



Impact

\$575,000+ in revenue from auction, donated to the Special Olympics International

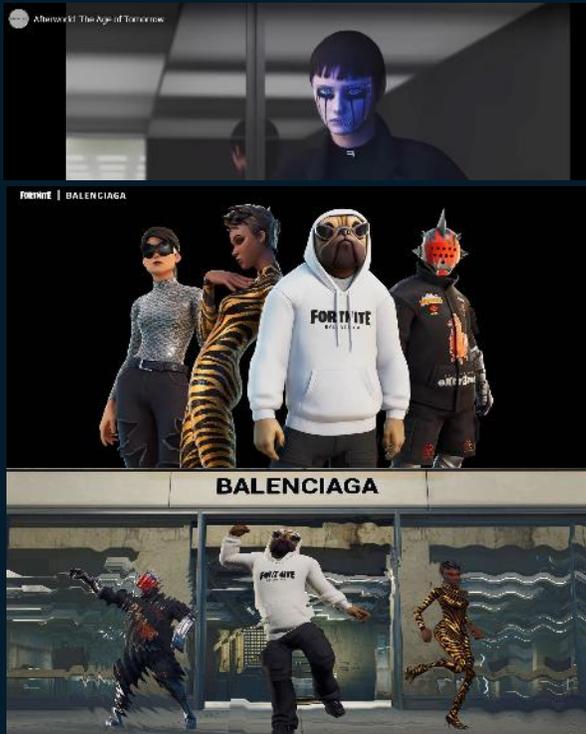
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The 50 NFTs sold for ~336 ETH (**\$800k**)

Fashion and beauty brands have used NFTs to create exclusive new experiences and products

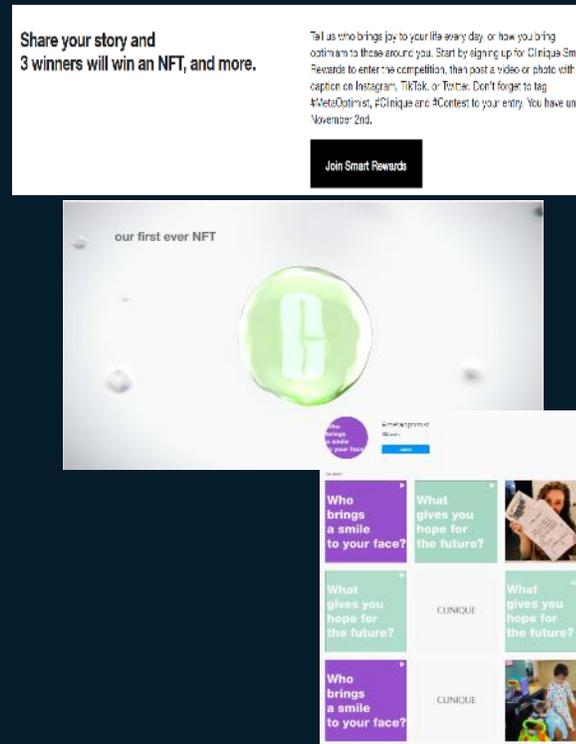
Balenciaga x Fortnite

The brand presented the digital garments as limited edition drops, raising the value of highly sought-out pieces. Balenciaga is not new to the use of gaming world as they presented the fall 2021 collection in a closed gaming environment, created using using Unreal Engine



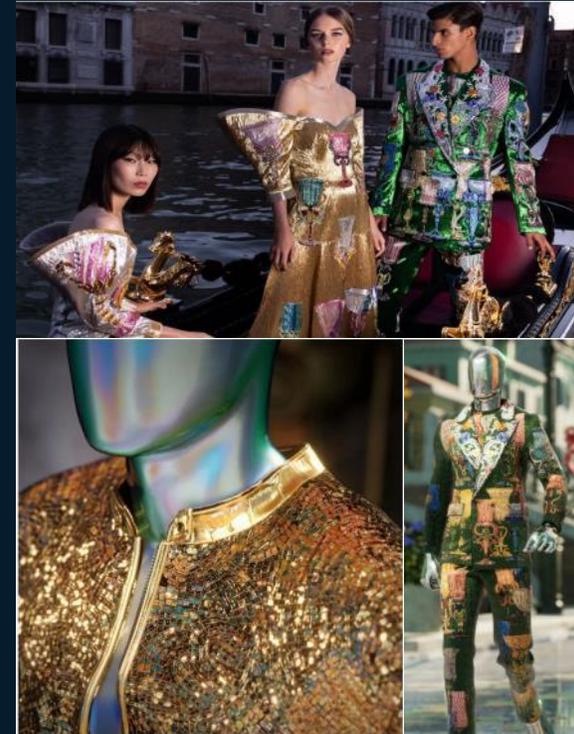
First NFT from Clinique

Clinique launched a social media reward campaign in October 2021, targeting brand's existing users with the goal of bringing them into the digital space. The company is using their first NFT as a prize for the social contest and stimulate the UGC.



D&G: first virtual collection

D&G launched a new entire virtual collection made by unique 9 pieces in 2021, called "Genesi", including NFTs, that could be bought and exchanged digitally. The auction was host by UNXD, generating 5.6€Mio



In financial services, significant value pools across the digital asset value chain in token issuance, lending, exchange, custody and payments

	Asset Issuance	Lending/ interest & yield	Exchange / OTC trades	Deposits / Custody	Domestic payments	Cross-border payments
Digital asset value chain stage	Creating pre-mined tokens and distributing them through various mechanism (e.g., liquidity provisioning)	Providing financing and investment services, such as lending backed by digital assets	Enabling customers to exchange or trade cryptocurrencies (for a fee)	Helping users and institutions manage digital assets (e.g., private keys) through hardware or software	Facilitating the use of cryptocurrencies as a payment method, including services such as cross-border payment and merchant processing	
Value pool	>\$200B	>\$50B	\$>300B	>\$20B		>\$30B
New entrants	 	 	 	 	 	 
How incumbents are reacting	 Offering includes fund raising with asset tokenization for corporates and SMEs	 Partnering with BlockFi to offer Bitcoin credit cards, with cashback being saved in BlockFi's saving protocol	 Trading desk for institutions to deal in Bitcoin derivatives (futures and non-deliverable forwards)	 Enterprise-grade platform for custody of digital assets , onboarding support and executive services for institutions	 Blockchain-based payments network for commercial clients to make USD payments 24/7	 Zero-fee retail cross-border remittances between Novi wallet users via Paxos USD stablecoin (currently US to Guatemala in pilot)

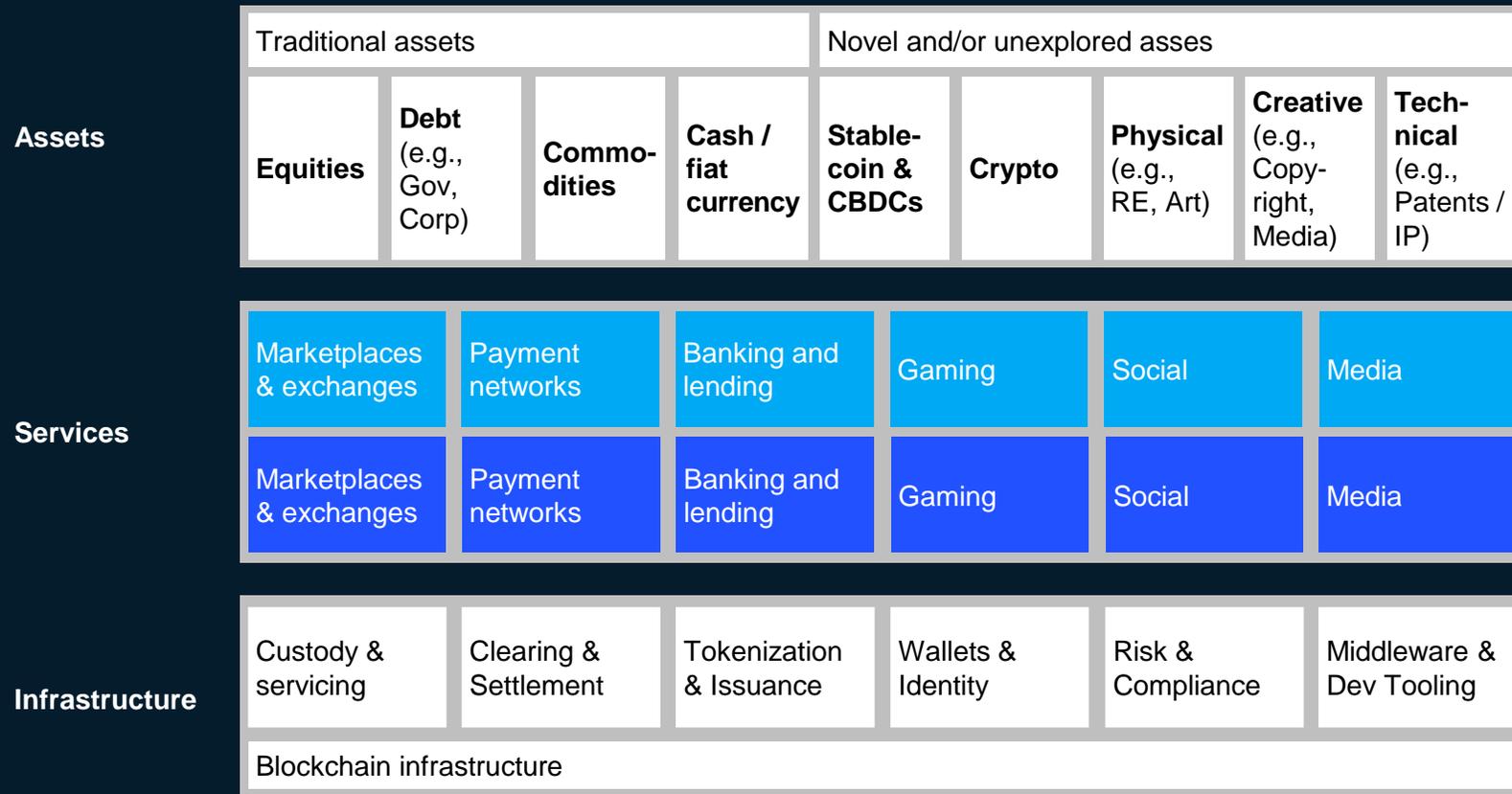
1. Other adjacent industry segments including but not limited to security auditing, accounting and legal services, and blockchain analytics
 2. As of May 1st, 2021

...and established financial service providers across sub-segments have become more active in digital assets

Companies	Digital asset-focused propositions	Sample logos
Banks	<p>Digital Asset trading and custody</p> <p>Real time, blockchain based payment networks</p> <p>Digital Asset financial services (e.g., collateralized lending)</p>	
Payment providers and network	<p>Digital Currency and CBDC market sizing</p> <p>Merchant acquiring services for crypto companies</p> <p>Payment processing for digital currencies (stablecoins)</p>	
Capital markets (e.g., exchanges, custodians, etc.)	<p>Digital asset trading and custody (public permission-less and private permissioned), including brokerage services</p> <p>Digital asset market making</p> <p>Asset tokenization and new asset go-to-market</p>	
Wealth and Asset Management	<p>Digital Asset trading and custody</p> <p>Digital Asset ETFs</p> <p>High yield products</p>	
Other	<p>Investment funds (investment theses and market scan)</p> <p>Real Estate (e.g., tokenized titles, mortgages)</p> <p>Entertainment and gaming (e.g., NFTs and consumer engagement)</p>	

Looking ahead, Web3 may impact many industries in far-reaching ways

■ Traditional ■ Web3



■ **New markets may continue to form and certain assets could continue to tokenize, tapping into latent customer demand**

■ **Multiple platforms may exist to deliver services, both traditional and web3 (centralized and decentralized)**

■ **Web3 infrastructure could continue to mature and support new assets**

Web 3.0: NFT and Metaverse demo

Identity, membership and communities

NFTs as digital identity (e.g., Bored Ape Yacht Club)



NFTs as tokenized communities and membership club (e.g., fan group, investment club)



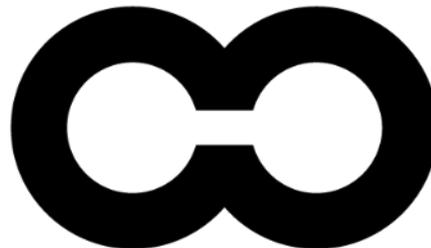
Digital art, galleries and auction houses

NFTs as digital art (e.g., ArtBlocks long-form generative art)



Art Blocks

Galleries and auction houses



Bringing it all together: metaverse experience

Metaverse experience – digital world



Decentraland

Metaverse experience – gaming



Appendix

Glossary of terms related to blockchain and digital assets

Blockchain	Blockchain is a specific variant of DLT (<i>see below</i>) in which blocks of transactions are linked to each other through cryptography, creating an unbroken, immutable and possibly searchable transaction history
Cold Storage	Cold storage is a way of holding cryptocurrency tokens offline. By using cold storage, cryptocurrency investors aim to prevent hackers from being able to access their holdings via traditional means
DAPP	A decentralized application (dapp) is an application built on a decentralized network that combines a smart contract and a front-end user interface
Decentralized Finance (DeFi)	A blockchain-based form of finance that does not rely on central financial intermediaries such as brokerages, exchanges, or banks to offer traditional financial instruments, and instead utilizes smart contracts, e.g., for lending and exchange
Digital assets	Anything that is stored digitally and is uniquely identifiable that comes with the right to use and can be used to realize value
DLT	A distributed ledger is a consensus of replicated, shared, and synchronized digital data geographically spread across multiple sites, countries, or institutions. Unlike with a centralized database, there is no central administrator
KYC	KYC, "know your customer" is the process of verifying a customer's identity via certain agreed conditions and requirements
Crypto exchange	Platform on which you can buy and sell cryptocurrency. Exchanges reflect current market prices of the cryptocurrencies they offer
Consensus mechanism	Defined as the computer process of validating information, creating a new block and recording that information into the blockchain
NFT	A non-fungible token is a unique and non-interchangeable unit of data stored on a digital ledger (e.g., currently used to represent unique digital art, music)
Node	A node, in the world of virtual coins, is a computer connected to a cryptocurrency network and can execute certain functions like creating, receiving or sending information
Public/private keys	Cryptographic system that uses pairs of keys, with each pair consisting of a public and private key (usually string of characters) that depend on cryptographic algorithms to encrypt and decrypt messages
Smart Contract	A self-executing contract with the terms of the agreement between buyer and seller being directly written into lines of code
Stablecoins	A stablecoin is a class of cryptocurrencies that attempt to offer price stability and are backed by a reserve asset such as fiat currency or a commodity
Wallet	Hardware (e.g., cold) & software (e.g., hot) that holds private keys and is used to provide secure access to digital assets.
