Digital assets

April 6, 2022

Web3 applications are built on top of 3 technology primitives: Blockchain, Smart Contracts & Digital Assets

Web3 Applications

DeFi | Gaming | Art | Media

Applications built on Web3 primitives that, in combination, can make up a 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

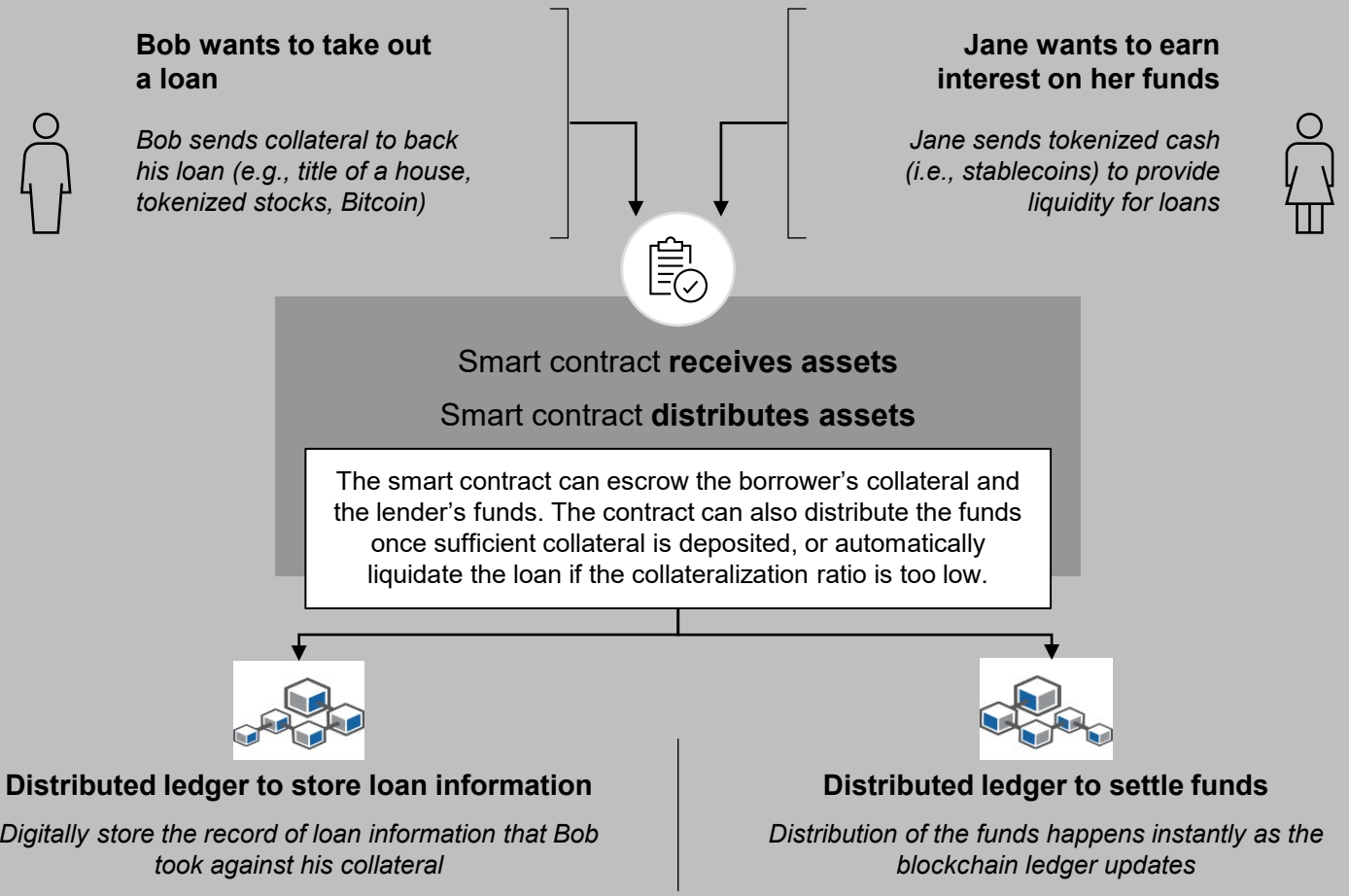
2: Smart contracts

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?



3: Digital assets & tokens

Assets	Description	
Native tokens	**Used to pay for (smart contract) transaction validation to the miner network (i.e., to add the transaction to the ledger)**. This token functions as the native reward currency paid to parties operating the nodes	*Bitcoin* *Ether* *Solana*
Governance tokens	**Governance tokens can be used to implement changes to smart contracts**. Parties who own sufficient governance tokens can put up proposals; all parties with governance tokens can vote; votes are recorded on the blockchain	*Aave* *Uniswap* *Chainlink*
Stablecoins & CBDCs	**Stablecoins represent cash on the blockchain network, and provide liquidity** to settle transactions in **"cash-equivalent"** units of value. They can be used to **engage with smart contracts** (in contrast to cash)	*USDC* *USDT* *Dai*
Tokenized assets	**Tokenized assets can represent any real-world asset on the blockchain network** (e.g., equities, bonds) so that they can **interact with smart contracts** (in contrast to plain digitized assets)	*Centrifuge* *Securitize* *Figure*
NFTs	**Unique assets that can represent anything of value** (e.g., digital media, art, gaming items, etc.). They are non-fungible (i.e., unique, specific properties); properties can be hard-coded in the contracts	*Bored Ape Yacht Club* *CryptoPunks*

New business models are enabled by 5 characteristics of the Web3 tech stack

Decentralized

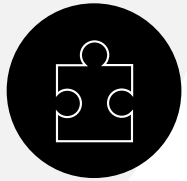
Ownership and operation is not controlled by a central entity, but distributed among a network of participants who independently operate and maintain the ledger

Permissionless

Users do not need permission from any central authority (e.g., by applying for an account) to read or write data or interact with the distributed ledger

Trustless

No need for participants to trust each other or centralized institutions – trust is established by the open-source code and the resilience of the decentralized ledger



Composable

Open-source code and protocols enables programs to freely interact and build on proven functionality, increasing the speed of innovation

Immutable

Once data is recorded or smart contracts are deployed to a distributed ledger it cannot be amended or adjusted, and is maintained indefinitely as a timestamped record

These fundamental technological characteristics underpin many of the advantages of Web3 businesses

Web3 is enabling multiple applications of Decentralized Finance (DeFi)

Deep dive follows

	From	To
Banking	Lending/borrowing – banks loans, interest earned on deposits	Lending protocols, yields earned on on-chain assets
Investing / Trading	Stocks, bonds, derivatives via banks and brokers	Digital assets (e.g., tokenized bonds, crypto) via decentralized exchanges and OTC desks; yield earned via liquidity provisioning in AMMs
Payments	Cash (fiat), bank transfer, credit cards	Stablecoins (e.g., fully reserved, algorithmic) and certain cryptocurrencies (e.g., BTC)
Insurance	Contract-based insurance	Smart contract-based automatic insurance protocols
Raising capital	Initial Public Offerings, debt issuance, venture capital	Price discovery via token offerings (e.g., Liquidity Bootstrapping Pool), Security Token Offerings (STOs)

Advantages of DeFi

Cost: Significantly lower overhead allows users to capture greater value (e.g., higher yields)

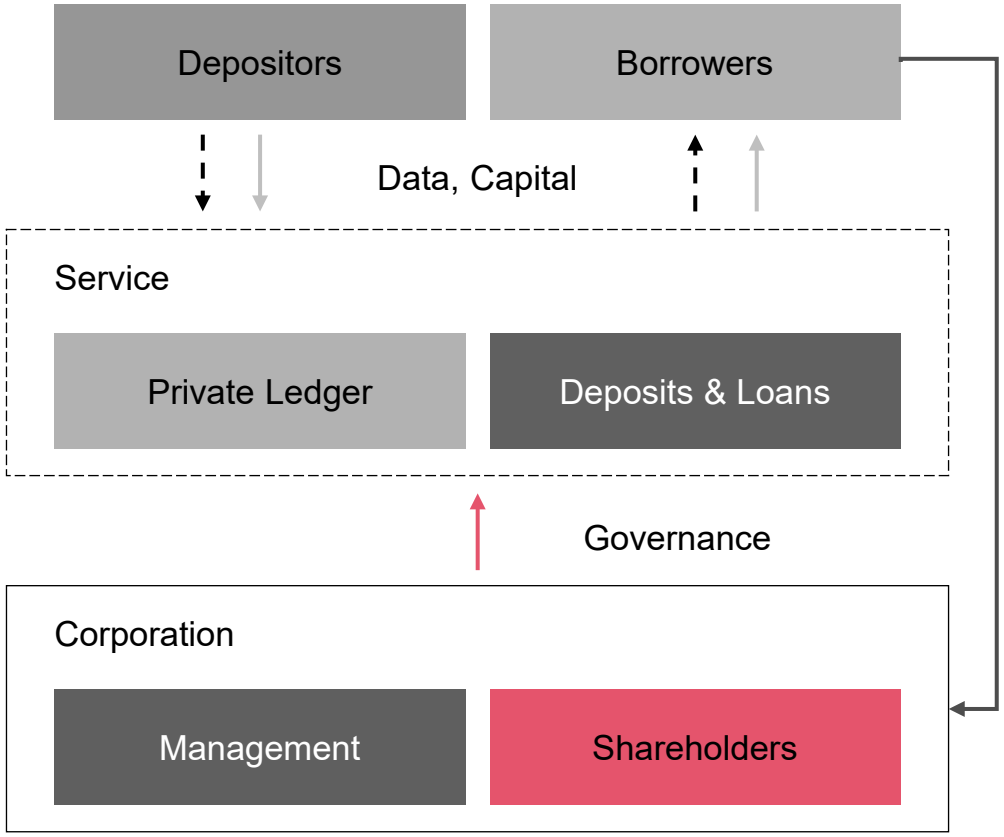
Accessibility: Global, permissionless, 24/7 access reduces consumer friction

Composability: New use cases can very quickly emerge by combining various open-source code projects

DeFi example: banking applications

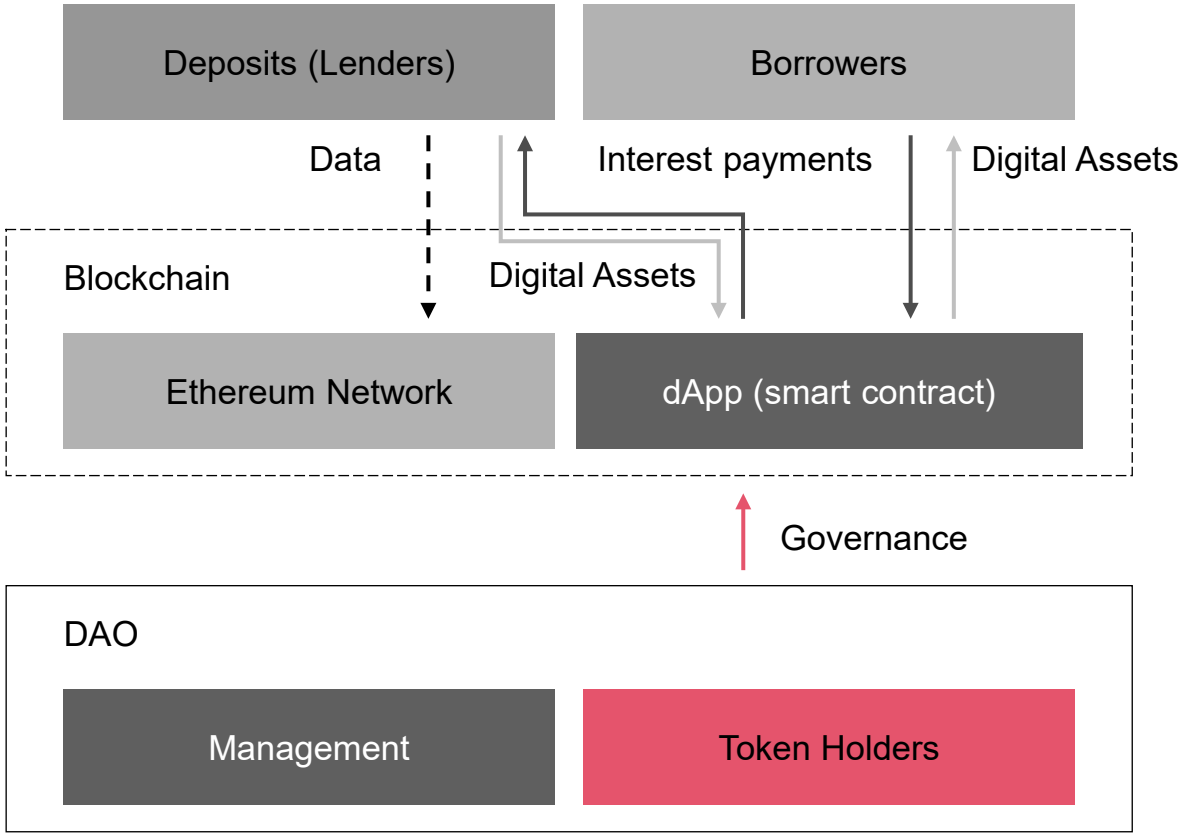
Illustrative **Non-exhaustive**

Web 2 bank: the model we all know



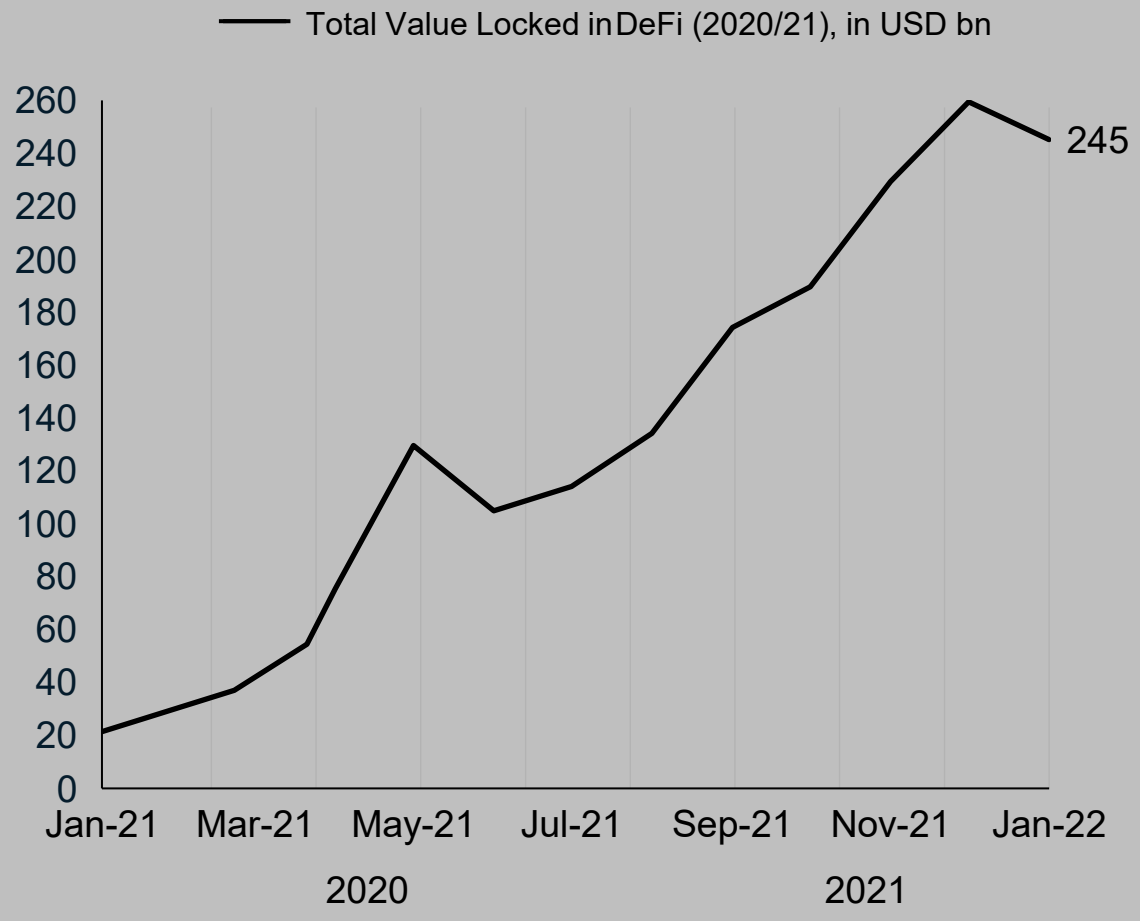
Interest payment

Web 3 bank: Decentralized deposit and lending pools



DeFi saw significant growth in 2021

More capital is allocated to decentralized finance to generate yield every month



Source: Coingecko, DeFiLama

Volumes of transaction activity in decentralized finance are becoming significant

~2T USD	Volume of on-chain stablecoin transactions per quarter, 2021
>1T USD	Volume on decentralized exchanges
>200B USD	Value of loans taken out on decentralized lending platforms
10-100%	Yield generated on locked assets (incl. stablecoins)

How might the digital currency landscape evolve?

Types of digital assets	Examples of use cases	Open questions
Fully reserved stablecoin issued on a public, permissionless blockchain	• Source of liquidity in DeFi lending protocols • Store of value within digital asset ecosystem (i.e., avoids needing to off-ramp) • Can be used to interact with smart contracts	**Will regulation (e.g., audit schedules, reserve requirements) impact the value proposition of these stablecoins?**
Deposit-based stablecoin issued on private bank-owned blockchain by an FDIC-insured entity	• Enable real-time fiat settlement of trades between permissioned participants (i.e., bank customers) • More efficient cross-border transactions (messaging and money movement)	**How can banks drive adoption across the industry to get scale benefits?** **How can banks compete with public permissionless networks?**
Central bank digital currency (wholesale), issued on a permissioned government blockchain	• Enable more precise, efficient and innovative implementation of monetary policy (e.g., negative interest rates, targeted stimulus injections) • Simplify financial services infrastructure	**What is the value proposition of a CBDC to consumers and businesses (incremental to other stablecoins)?**
Cryptocurrency unlinked from fiat with a floating value (e.g., Bitcoin, Ether)	• Used to pay for ledger changes (i.e., transaction validation to the miner network) • Store of value and inflation hedge due to limited supply (primarily BTC)	**What role will digital assets play in the broader financial system (e.g., will central banks hold cryptocurrencies on their balance sheets)?**