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Web3 Primer

Are we on the brink of making a more prosperous, efficient, equitable future a reality?

Currently…

- The vaccine supply chain is disorganized, with 50% of vaccines going to waste due to supply-chain failures
- Various analyses indicate that multiple trillions of dollars are trapped in global value chains—either in inventory, during production, in transit, or in receivables
- Facebook and Google earned $230B in 2019 through advertising based on your information and actions
- Sending remittances is costly, with the global average cost of sending $200 being 6.1% in 2020
- Most corporations are structured as they were in the 1600's: companies accept investor funds in exchange for maximizing shareholder value as their primary mission

Imagine a world in which…

….products could be **tracked reliably and in real-time** throughout the supply chain

…smallholder farmers could **securely receive payments within minutes** rather than weeks

…you were able to **own, sell, and reap the benefits of your own data** and content

…the cost of sending remittances was a **fraction of a percent**

…governance structures were **designed *and assured* to truly be bottom up**

For the first time ever, this world might be closer than we think, and it would be powered by Web3.

Source: UNICEF, Blockchain Graduate, Sta Twig; Forbes, Should tech companies be paying us for our data?, 2020; World Bank, Supply chain finance by development banks and public entities handbook, 2021; World Bank, Remittance Prices Worldwide, 2022; PYMNTS, Blockchain tackles farming's cash flow bottlenecks, 2020; World Economic Forum, Re-envisioning corporations, 2022

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This primer explains what Web3 is and how it can drive social impact

1. BUILD A FOUNDATIONAL UNDERSTANDING

- Clarify what Web3 and blockchain technologies are
- Explain why they matter for social impact

2. DEMONSTRATE IMPACT OF TECHNOLOGIES

- Present key Web3 use cases: DAOs, metaverse, NFTs, DeFi, Cryptocurrency, and "better mousetraps"
  - Explain the technology
  - Provide examples with social impact
  - Outline major challenges to address

Part 1 of 2: Web3 and blockchain as a foundation

01 **Why should you care about Web3 and blockchain?**

02 What is Web3?

03 What is blockchain?

04 How can Web3 and blockchain underpin social impact?

Attention around Web3, often touted as the next evolution of the world wide web, is growing at a rapid pace

The global Web3 market size is expected to reach USD 81.5 billion in 2030, up from USD 3.2 billion in 2021. This represents a 34.2% CAGR over this time period. Most growth is expected to occur in the Asia Pacific market.

Web3 will increasingly leverage other emerging technology trends that are converging to change the way digital users interface with the physical/real world. Notable synergies include Web3's interactions with Digitization, Augmented Reality/Virtual Reality, Internet of Things, Artificial Intelligence, and Machine Learning.

Investment in research & development in Web3 continues to increase, with over 10,000 reports covering niche topics. In addition, large, established companies are investing in R&D, along with several governments.

In a survey of 1,280 senior executives across the globe, 73% indicate that their organization will lose an opportunity for competitive advantage if they don't adopt blockchain and digital assets. Digital assets are expected to have the greatest positive impact on making processes more efficient, increasing compliance and transparency, and enhancing trust.

Sources: Emergen Research, Web 3.0 Market, 2022; Deloitte, Deloitte's 2021 Global Blockchain Survey

Experts believe that Web3 has the potential to change society for the better, if done right

Web3 is not only a new foundational layer of the world wide web, it is a fundamentally new approach to corporate governance, value creation, and stakeholder participation with pari passu interests. It presents an opportunity where people are not merely products or beneficiaries of technology-powered business models but builders and owners of digitally unique assets.

- Dante Disparte, Chief Strategy Officer and Head of Global Policy at Circle Internet Financial, as part of the World Economic Forum Annual Meeting 2022

A vision for Web3 could include:

An Alternative to Broken Tech Paradigms	Digital authoritarianism and big tech are, in the long run, incompatible with a healthy open society. Web3 is a better way to build digital platforms that are directly accountable to their users.
More Resilient, Inclusive Digital Infrastructure	Too many of our digital systems are broken. They leak data and leave too many people behind. Web3 platforms are decentralized, democratized, and far more resilient and inclusive.
Renewed Trust in Institutions	Confidence in institutions is at an all-time low. Web3 creates new modes of participatory, accountable governance, improves auditability, and introduces technologies to balance the competing needs for transparency and individual privacy.

Sources: D. Disparte, World Economic Forum Annual Meeting, How Web3 will level the playing field and unlock income equality, 2022; a16z, Web3 Policy Hub, 2022

The social impact sector is exploring ways to leverage Web3 and its underlying blockchain technology

Blockchain for Education: Creating an Open Architecture for the Learning Economy

The World Bank, 2020

How Web3 will level the playing field and unlock income equality

World Economic Forum, 2022

To save independent journalism, media must embrace web3 innovation

TechCrunch, 2022

How blockchain is helping WFP's fight against coronavirus in Bangladesh

World Food Programme, 2020

How a Blockchain Company Is Harnessing NFTs to Promote Social Good

Entrepreneur, 2022

How Web3 & Blockchain Tech Can Empower Artists

Forbes, 2022

Web3 Technology Brings Humanitarian Value to Ukraine

Gartner, 2022

Philanthropic DAOs: Creating Social Responsibility in Web3

Nasdaq, 2021

Chainlink Collaborates With UNICEF To Empower Communities Using Blockchain Technology

Chainlink, 2022

How could blockchain power government services and uplift citizen voices?

New America, 2021

This is how blockchain technology is transforming life for farmers

World Economic Forum, 2022

How Finland is Using the Blockchain to Revolutionise Financial Services for Refugees

ReliefWeb, 2018

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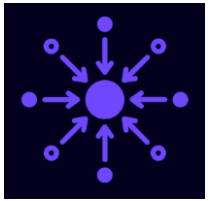
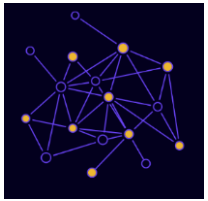
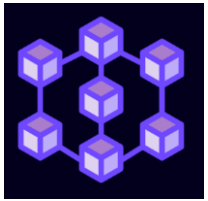
Web3 builds on Web1 (read-only) and Web2 (read/write) to be read/write/own for its users

If the pre-internet/Web1 era favored publishers, and the Web2 era favored the platforms, the next generation of innovations — collectively known as Web3 — is all about tilting the scales of power and ownership back toward creators and users.

- Li Jin, Co-Founder of Variant Fund, investing in Web3 and the ownership economy

Web1	Web2	Web3
1990 - 2004	*2004 - Present*	*2014 - The future?*
		
• Mostly static web pages to read *(read-only)* • Built using open protocol, but sprawling and disorganized • *Ex: HTML site with simple text, images, and links*	• Information-centric and interactive *(read/write)* • Few concentrated platforms own and monetize data • *Ex: Meta, Google, Twitter*	• Users own their data rather than the platforms *(read/write/own)* • Democratized and peer to peer, combining the functionality of Web2 with the decentralization of Web1 • *Ex: cryptocurrency, NFTs, DAOs*

Sources: HBR What is Web3?; The Web3 Renaissance: A Golden Age for Content; ethereum.org, Introduction to Web3, 2022

Web3 is a decentralized, blockchain-based internet ecosystem owned and operated by its users

[Web3] fixes the core problem of centralized networks, where the value is accumulated by one company, and the company ends up fighting its own users and partners.

- Chris Dixon, General Partner at Andreessen Horowitz

While the current internet, Web2, relies on systems and servers owned largely by big corporations, Web3 uses a decentralized architecture – blockchain – that enables three fundamental features of the Web3 ecosystem.

Anonymous single-sign-on

An individual would have one username and authentication method across all websites and networks, which would be 'interoperable.' While data assigned to a user is transparent, users would not be required to relinquish control of sensitive personal data.

Individual ownership and tokenization

Activities that contribute to Web3 (e.g., a social media post) are rewarded by tokens to incentivize participation and distribute ownership. Tokens would be a way to monetize one's own data (e.g., content creation) and would not require third parties that charge fees.

Self-governing

Alongside distributed ownership is distributed decision-making power. Without central authority, users determine the governance (e.g., of a platform or site).

It is important to note that Web3 is still in its infancy. The extent to which Web3 will ultimately look like its utopian concept is still TBD, and this will be determined by those actively working to design and build it.

Sources: L. Jin and K. Parrott, Harvard Business Review, Web3 Is Our Chance to Make a Better Internet, 2022; R. King, World Economic Forum, Web3: The hype and how it can transform the internet, 2022; S. Ghosh, VentureBeat, Web3 holds the promise of decentralized, community-powered social networks, 2022

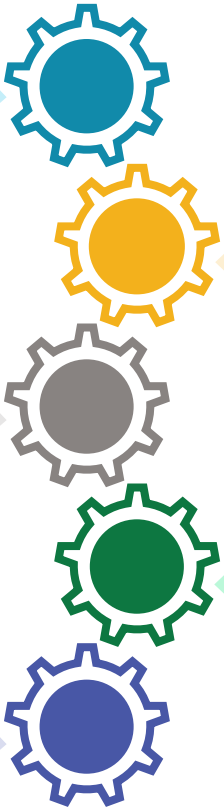
Because of its features, proponents of Web3 believe that it is the 'future of trust'

The rise of human civilization is a story about ever-increasing **scale of cooperation**

Our **model of Trust** has evolved over time, from a social model to an institutional model

Web1 brought an internet with open and inclusive protocols. But open source is hard to monetize, so companies began building proprietary protocols, resulting in control of data, relationships, governance, etc. ***Institutions are the gatekeepers of trust*** *(Web2).*

Web3 could usher in the era of a **programmable Trust** model. With Web3 and blockchain, Trust is becoming unbundled, decentralized, and inverted – bottom-up from individuals and software rather than top-down from institutions to individuals.



Scale of cooperation is driven by **Trust**, made up of social elements, math & physics, and incentives

e.g., facial expression, status, brand

e.g., knowledge of the real world

e.g., difficulty, regulation, rewards

The question now is: **How do we get back to a model of Trust without gatekeepers, while still having (free) access to technologies?**

From: ***DON'T*** **be evil** → To: ***CAN'T*** **be evil**

Source: A. Yahya, Andreessen Horowitz, Web 3.0 and the Future of Trust, 2018

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Blockchain enables Web3 through several unique features

The blockchain is a distributed, immutable ledger that is open to anyone, with the following features:

IMMUTABILITY

Data on the blockchain cannot be changed.

DECENTRALIZED AUTHORITY

No governing authority is required. The code is self-sufficient. Users on the network validate transactions.

DISTRIBUTED LEDGER

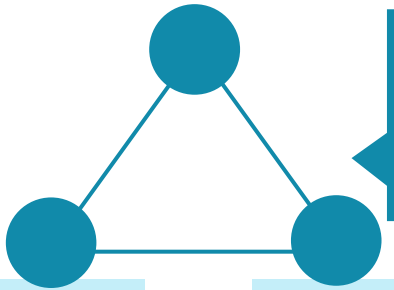
The ledger is maintained by all other users on the network. This distributes computational power, allowing more secure transactions.

CONSENSUS MECHANISMS

Algorithms ensure that each new entry of data is agreed upon by the network, creating a trustworthy ledger.

These features enable three outcomes which form the 'blockchain trilemma,' meant to describe that a blockchain can optimize for, at most, only two of the three outcomes:

DECENTRALIZATION
Distribution across nodes make blockchain unlikely to break down or be hacked



Ex: Blockchains that are more decentralized are often more secure but less scalable i.e., Bitcoin

SECURITY
Nobody can tamper with information on the blockchain

SCALABILITY
The network is able to accommodate growth while maintaining efficiency

Source: 101 Blockchains, Introduction to Blockchain Features, 2021; Ledger, What is the blockchain trilemma?, 2021

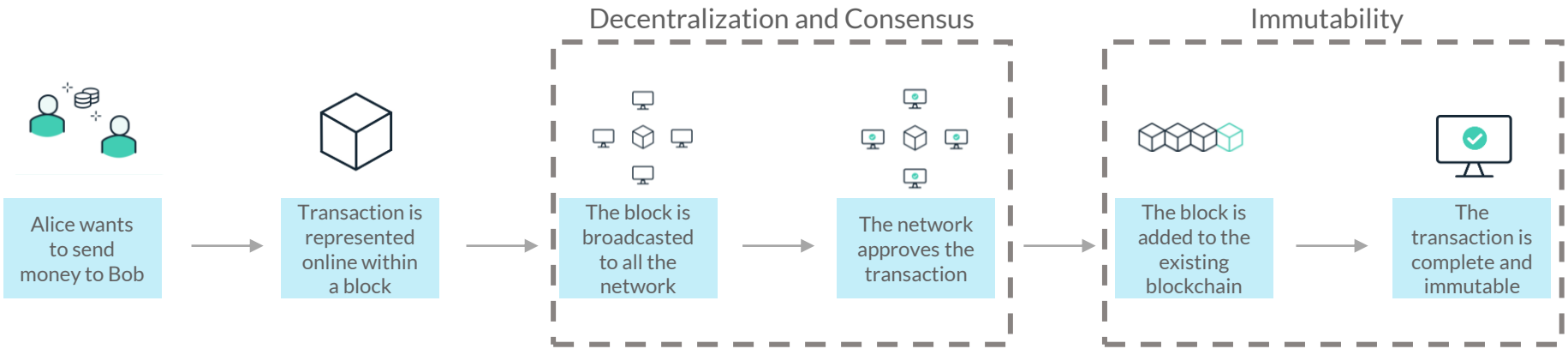
Blockchain works by storing information in blocks and connecting (i.e., chaining) this data to each other

The blockchain is a technology that…

permits information to be gathered into blocks and recorded,

chains blocks in chronological order,

and allows the resulting ledger to be accessed by different nodes



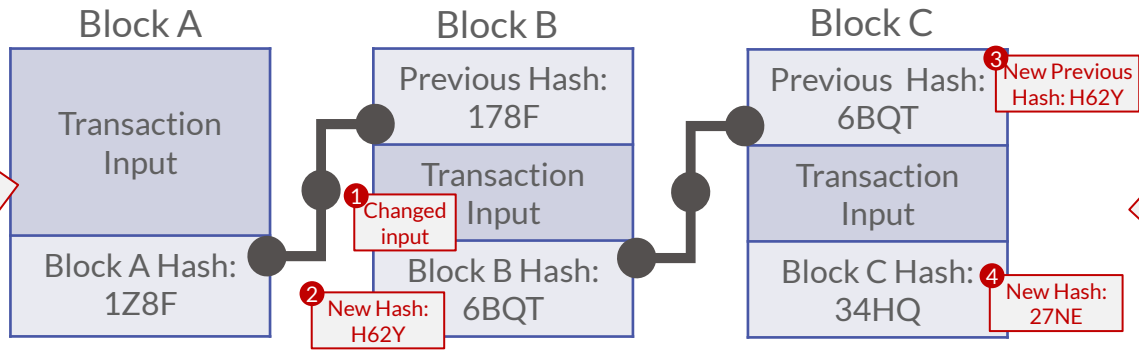
"If I send you bitcoin, that transaction is simultaneously recorded on the more than 12,000 devices that Bitcoin runs on. Everyone on the chain can see the transaction, and no one can alter or delete it."
– HBR What is Web3?

Source: Medium: What is Blockchain and how does blockchain work?; HBR: What is Web3?

Altering the tiniest piece of information in a blockchain will create a domino effect of changes that are discarded

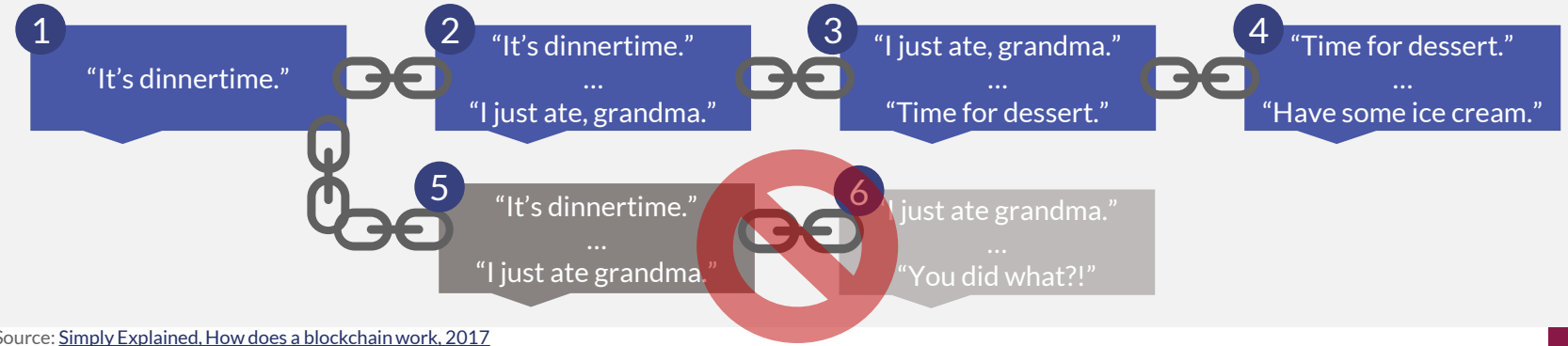
Hashing is the process of converting all the transactions in a block into a unique digital fingerprint (i.e., a hash key)

If any information in a block is tampered with, then its digital fingerprint changes, which in turn changes the digital fingerprint of all subsequent blocks



When new hash keys are generated (e.g., by a nefarious actor tampering with past transactions), they are rejected by the network

A fun analogy:



Source: Simply Explained, How does a blockchain work, 2017

Note: For an informative, visualized demonstration of blockchain and hashing, watch Anders Brownworth, Blockchain 101 – A visual demo, 2016

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Blockchains have varying levels of efficiency based on their type and consensus mechanism

BLOCKCHAIN TYPES

Permissionless Blockchains	Permissioned Blockchains
Require no permission to join and interact with	Require permission from administrator to join and interact
Fully decentralized, public	Partially decentralized, private
High security but lower scalability	More scalable network but less transparent
Lower energy efficiency and transaction speed	Greater energy efficiency and transaction speed

Proof of Stake will have a much lower carbon footprint. While Ethereum currently uses more energy than Belgium, Ethereum 2.0 will reduce energy consumption by 99.95% (expected to occur mid-September 2022)

CONSENSUS MECHANISMS

In blockchains, the networks use a **consensus mechanism** to decide how to verify and add new blocks into chain. The main two consensus mechanisms are:

Proof of Work (PoW)	Proof of Stake (PoS)
To add a block of information to the chain, miners have to solve a puzzle that requires a lot of computational power	Validators of transactions are chosen based on a set of rules depending on the "stake" or amount of tokens they commit to allocating to a pool
Miners earn cryptocurrency for solving puzzles first and validating transactions	The validator does not receive a block reward as they are paid a network fee
To introduce a malicious block, hackers need 51% of network's computing power	Hackers would need to hold 51% of all cryptocurrency on the network
Used by Bitcoin, Ethereum and older cryptocurrencies	Used by Ethereum 2.0 and newer cryptocurrencies
Less energy-efficient, more costly, but more reliable	More energy efficient, less costly, less reliable
Issue: requires large amounts of energy, creating concerning environmental effects and centralizes miners in low-cost areas	**Issue**: Large upfront coin investment to qualify as validator, may lead to an exclusively wealthy blockchain

Source: 101Blockchains: Public vs Private Blockchain; Ethereum, Ethereum upgrades, 2022

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Many Web3 and blockchain use cases are being explored, as well as their significance for social impact

NON-EXHAUSTIVE

Decentralized Autonomous Organizations

Definition: A group that comes together to make decisions without a central authority. built on a blockchain with members usually acquiring governance tokens which give them the ability to vote on decisions

Social Impact Significance: Allows for new models of community organizing, grantmaking, and democratized decision making

Decentralized Finance (DeFi)

Definition: Shifting traditional financial products to the open source and decentralized world, removing the need for intermediaries, reducing costs, and improving reliability of technology

Social Impact Significance: Can increase access to financial products for the underbanked

Metaverse

Definition: An open, shared, and persistent virtual world that offers access to the 3D virtual spaces, solutions, and environments created by users

Social Impact Significance: Allows for more effective education, healthcare, and social interactions through immersive online experience

Cryptocurrency

Definition: A decentralized digital currency that is secured by cryptography

Social Impact Significance: Can significantly reduce the transaction cost for remittances, a significant portion of income in certain developing economies

Non-Fungible Tokens (NFTs)

Definition: Publicly verifiable intellectual property authenticated on a blockchain

Social Impact Significance: Allows for new forms of fundraising and patron community interaction

Other – "better mousetraps"

Definition: Blockchain offers a better solution when databases require multiple parties to add information, all participants share a common goal, no third party is desired, and there is risk of your database being compromised

Social Impact Significance: The blockchain can increase transparency in supply chain tracking, create trusted identity databases, digitize land ownership databases, and more.

Note: A smart contract is computer code that automatically executes an agreement and is stored on the blockchain

Source: Coinmarketcap: Crypto Glossary; Binance Academy: Crypto Glossary ; Blockchain Council: Web3 vs Metaverse; NYT: What are DAOs?; Blockchain Training Alliance, Blockchain Decision Chart, 2018

These use cases intersect with and build on each other within the Web3 ecosystem

NON-EXHAUSTIVE

Decentralized Autonomous Organizations

Cryptocurrency: DAOs use cryptocurrency tokens to facilitate voting amongst members to reach decisions

NFT: For example, Nemus uses a DAO to decide how to allocate funding from an NFT sale. Purchasers of the NFT use cryptocurrency tokens to vote on allocation decisions

Decentralized Finance (DeFi)

Cryptocurrency: Decentralized financial products will use cryptocurrencies on the blockchain due to their security and efficiency

Metaverse

DeFi: The metaverse will use decentralized finance and cryptocurrencies to create a trustless economy where users can earn, spend, borrow, lend and invest without a central governing unit

NFT: NFTs will serve as the virtual assets in the metaverse, being used as avatars, plots of virtual land, or tickets for exclusive access, along with being traded, customized, and monetized

Cryptocurrency

Several: Cryptocurrencies will be the currency involved in enabling decentralized finance, transacting in the metaverse, purchasing NFTs and voting in DAOs due to crypto's secure, decentralized, efficient structure on the blockchain

Non-Fungible Tokens (NFTs)

DeFi: NFTs can be used as reliable, easy to access loan collateral, insurance policies can be converted into NFTs and bought and sold, and NFTs can be divided into fractional shares

Metaverse: The main form of ownership in the metaverse will be NFTs

Other – "better mousetraps"

Several: Each of these Web3 technologies are applications of blockchain technology

Note: A smart contract is computer code that automatically executes an agreement and is stored on the blockchain

Source: Coinmarketcap: Crypto Glossary; Binance Academy: Crypto Glossary ; Blockchain Council: Web3 vs Metaverse; NYT: What are DAOs?; Blockchain Training Alliance, Blockchain Decision Chart, 2018

Despite the potential, key considerations and challenges must be addressed to maximize Web3's social impact

Ethical

Web3 can exacerbate inequities and online harm

- Ownership and power of Web3 systems can be centralized by major platforms and the wealthy
  - **Ex**: OpenSea is the leading centralized platform for creating and selling NFTs, giving them significant control in decisions for the NFT space
- A more immersive online experience can exacerbate issues of harassment and abuse, along with lacking regulatory structures to mitigate these harms
  - **Ex**: In the popular virtual reality game, VRChat, a violating incident such as harassment occurs about once every seven minutes, according to the nonprofit Center for Countering Digital Hate

Regulatory

Web3 lacks regulatory protection for its users

- Users experience minimal legal protections, a lack regulators to appeal to for issues such as fraud, and lack awareness of risks due to a lack of disclosure regulations, largely due to tech innovation moving faster than regulatory innovation
  - **Ex**: In January 2021, NYT reported that $140B worth of bitcoin is lost in wallets whose keys have been forgotten. Without a central management, there is little customer support with the ability to help

Environmental

Proof of work mining requires tremendous amounts of energy

- In 2019, Bitcoin was estimated to use 218 TWh of energy or 0.13% of global energy production, more than the entire countries of Belgium and Finland
- To minimize environmental harm, blockchain practitioners must consider strategies such as using more efficient consensus mechanisms than Proof of Work and minimizing generation of physical technological waste

Technical

Blockchain is difficult to scale due to issues of efficiency and audience understanding

- Permissionless blockchains are only capable of processing a few transactions per minute, and will become more expensive as inefficient and use increases, forcing tradeoffs between centralization and speed
- A lack of baseline technical understanding of blockchain prevents use or results in improper use

Source: HBR: What is Web3?; SSIR: Web3 and the Trap of 'For Good'; Ethereum.org: Web3 Limitations; a16z: Web3 policy perspectives; NYT: The Metaverse's Dark Side; Counterhate: Facebook's Metaverse

Are we on the brink of making a more prosperous, efficient, equitable future a reality?

Blockchain could enable a world in which…

 ….products could be **tracked reliably and in real-time** throughout the supply chain	Blockchain's distributed ledger would enable each point in the supply chain to immutably record and upload the status of products, increasing efficiency and reducing waste
 …smallholder farmers could **securely receive payments within minutes** rather than weeks	Smart contracts on blockchain allow farmers to automatically facilitate B2B payments and trade finance
 …you were able to **own, sell, and reap the benefits of your own data** and content	Web3 social networks enable users to decide how they want to collect and store data and when they want to sell it
 …the cost of sending remittances was a **fraction of a percent**	Blockchain uses encrypted distributed ledgers to enable real-time transaction verification without the use of intermediaries like banks
 …governance structures were **designed *and assured* to truly be bottom up**	DAOs use smart contracts to grant members the ability to vote on decisions such as asset allocation without a centralized authority

Web3 use cases could make this future a reality

Source: Techstars, Bext360: Blockchain for a transparent, sustainable supply chain; PYMNTS, Blockchian Tackles Farming's Cash Flow Bottlenecks, 2020; Payments Journal, Innovating Global Remittances, 2022

Part 2 of 2:
Key use cases for social impact

01 Decentralized autonomous organizations (DAOs)

02 Metaverse

03 Non-fungible tokens (NFTs)

04 Decentralized Finance (DeFi)

This section will analyze distinct Web3 use cases to answer the following questions

What is the technology?

- How does the technology work?
- How does this new technology differ from the status quo?

How can it be used to generate impact?

- What types of social impact can this technology generate?
- What are key examples of their use for social impact?

What are the major challenges that need to be addressed?

- What are the major regulatory, ethical, and technical challenges to address to enable these technologies to generate impact?

Part 2 of 2:
Key use cases for social impact

01 Decentralized autonomous organizations (DAOs)

02 Metaverse

03 Non-fungible tokens (NFTs)

04 Decentralized Finance (DeFi)

DAO | What is it?

DECENTRALIZED
Decision-making power is distributed across members, using smart contracts to automatically execute actions

AUTONOMOUS
A self-governing entity with no central authority, coordinated by transparent governance rules

ORGANIZATION
A community of members with common goals

A **smart contract** is computer code that automatically executes an agreement and is stored on the blockchain

Traditional Centralized Authority	Decentralized Autonomous Organization
Hierarchical, central authority makes decisions for organization	Flat, decision-making power is distributed across members
Governance is based on leadership team	Governance is based on the members of DAO
Leadership can implement changes without voting, any voting is facilitated manually	Members must vote to approve key decisions, voting process is automated and tamper-proof
Trust is based on experience and past relationships; risk of manipulation	Trust is based on encoded, transparent, immutable smart contracts
Low Transparency, private decision-making	High transparency, open-source code, public decision-making
Operations are handled manually	Handling of operations is automated through code

Source: Busy Technology, The next generation of DAO, 2020; Harvard Law School, Introduction to Smart Contracts, 2018

DAO | How can it be used to generate social impact?

NON-EXHAUSTIVE

DAOs can be used to improve each of these steps along the timeline for generating social impact

Organizing Community	**Breaking down siloes**: DAOs can enable like-minded individuals in to share resources, ideas, and funding, rather than remained siloed in centralized organizations	**Ex in Health**: VitaDAO allows scientists interested in anti-aging research to pool their resources, vote to conduct research on topics otherwise neglected, and share ownership of the intellectual property developed
Raising Funds	**Novel incentives and efficiency in donation**: DAOs provide new motivation for donation of funds such as decision-making power, a cohesive community, and receipt of visible tokens or NFTs, along with increasing speed in fundraising by avoiding red tape	**Ex in Gender**: ChoiceDAO was able to rapidly organize after the overturn of Roe to raise $1M through NFT sales with all proceeds going to organizations voted on by the community
Distributing Funds	**Restructuring Power**: Rather than philanthropies and funders controlling decision-making, non-profits and/or beneficiaries can decide how to allocate funds in DAOs	**Ex in Food Security**: Big Green DAO allows food justice non-profits to vote themselves on how to allocate treasury of grant dollars as DAO members, rather than a philanthropy deciding allocation
Accountability and Governance	**Novel accountability models**: DAOs can be more transparent than traditional organizations because the group's decisions are recorded on the permanent, visible blockchain ledger	**Ex in Humanitarian Assistance**: DAO Charity votes on, records, and publishes the purchases made with donated funds for Ukraine. This transparent model is commonplace with DAOs, but rare with traditional charities.

Source: VitaDAO, About VitaDAO, 2021; CryptoAltruism, Web3 and the fight for reproductive rights, 2022;

DAO | Example: VitaDAO

"The world's first decentralized intellectual property collective"

VitaDAO is a collective for community-governed and decentralized research in the longevity space

- VitaDAO allows scientists interested in anti-aging research to pool their resources, vote to conduct research on topics otherwise neglected, and share ownership of the intellectual property developed in the form of IP-NFTs
- Founded in 2021, global membership of over 7000 on Discord, operates through use of VITA tokens on blockchain

THE PROBLEM

- **The current IP and research systems results in misaligned incentives,** focusing on profits or publication rather than innovation and health: Scientists fear ideas being stolen, resulting in redundant experiments, and companies shielding IP
- **Early-stage research has a funding gap**: Projects that are early-stage, pre-patent are not funded by academic research or commercialized industries, particularly in the aging field which is not currently recognized as a disease

THE TECHNOLOGY

- Members of the public can join VitaDAO and earn VITA tokens by contributing funds, work, valuable research data, or IP assets
- VITA tokens allow members to vote on decision-making related to VitaDAO's governance, signal support for specific initiatives, and manage its data and IP portfolios
- **The result is a collaborative research experience**, on topics dictated by researchers rather than grant-makers or private companies, with contributors earning benefits from IP-NFTs

THE IMPACT

- ✓ 200+ projects sourced
- ✓ 2.5M funded
- ✓ 6M treasury
- ✓ 7000+ active discord members

- ✓ Inspired other innovation in the DeSci space: LabDAO, which is co-founded by a VitaDAO community member, focuses on organizing a digital ecosystem where research scientists can collaborate for wider research aim

DAO | Example: KlimaDAO

KlimaDAO allows individuals to purchase carbon offsets in the form of KLIMA tokens in a transparent market.

- The goal is to increase the price of carbon offsets, forcing companies to adapt to climate change more quickly.
- How carbon offsets work: Businesses who capture carbon or avoid pollution can collect carbon offsets equivalent to the amount of emissions avoided and sell them to companies looking to reduce their emissions numbers

THE PROBLEM

- **The current carbon market is fragmented, illiquid, and opaque**: Carbon credits come in several varieties and sold through brokers and middlemen, with trades often occurring behind closed doors, resulting in undervaluation of carbon
- **The voluntary carbon market requires rapid growth to reach the climate goals of the Paris agreement:** The volume of the voluntary carbon market needs to grow by up to 15 times by 2030 to limit the rise in temperatures to 1.5 degrees

THE TECHNOLOGY

- KlimaDAO **purchases large amounts of carbon offsets from the traditional market and brings them "on-chain"** ,or stored in the blockchain, onto the Polygon Network by the Toucan Protocol
- These on-chain carbon credits are sold using the KLIMA tokens which are:
  - Fungible: can be bought, sold, or retired
  - Backed: by at least 1 ton of verified carbon offsets
  - Useful: can earn interest and provide the ability to vote on policy

THE IMPACT

- ✓ Founded in October 2021, KlimaDAO has already **brought $100M worth of voluntary carbon market liquidity on-chain**
- ✓ KLIMADAO has **absorbed 17.8M tons of carbon or equivalent to the emissions from 3.9M cars in one year**
- ✓ Over 60,000 community members known as Klimates
- x Generally, the validity of carbon credits is questioned as many are believed to come from exaggerated claims of carbon reduction

Source: Bloomberg, KlimaDAO responds to Bloomberg Story on Carbon Offsets, 2022; KlimaDAO, Frequently asked questions, 2022; WEF, How a carbon-backed cryptocurrency is tackling climate chage, 2022

DAO | What are the major challenges that need to be addressed?

Regulatory

Legal uncertainty was identified as the most pressing issue for DAOs at the DAO Summit

- DAOs face uncertainty related to regulations for operations, treasury management, taxation, and more, creating a lack of clarity for what activities will be legal and under what constraints
- DAOs do not have a legal framework or liability protections like LLCs
- Further, they also exist across multiple jurisdictions, meaning legal issues that may arise will deal with numerous regional laws

Technical

DAO voting structures have struggled to ensure turnout and equity

- Voter apathy is "a crisis-level problem" in DAOs leading to a breakdown of democratic processes. For 99% of DAOs, less than 0.5% of governance token holders participate in voting on proposals. Developers are exploring applications which incentivize regular participation.
- The common 1 token, 1 vote structure of DAOs has resulted in voting power concentrated in economic power and the ability of tyranny of the majority, highlighting the importance of continued exploration of alternative voting structures

Ethical

The current functioning of DAOs can be exclusive and inequitable for members

- Many DAOs are funded and heavily controlled by venture capitalists rather than individual community members
- The minimum capital that qualifies one for membership in most DAOs is a barrier for many individuals. Ex: The popular social DAO Friends with Benefits costs $4,000 to join
- Coin voting in governance could lead to a small number of wealthy coin-holders having disproportionate power, highlighting the need for equitable DAO governance design

Source: The Defiant, Scaling DAOs, 2021 Signvm, The problem with DAOs, 2022;NYT, What are DAOs?, 2022; Vitalik, Moving beyond coin governance, 2021; Hackernoon, The challenges for DAO adoption, 2022; Financial Express, DAOs and Web3 Governance, 2022

Part 2 of 2:
Key use cases for social impact

01 Decentralized autonomous organizations (DAOs)

02 Metaverse

03 Non-fungible tokens (NFTs)

04 Decentralized Finance (DeFi)

Metaverse | What is it?

The Metaverse is a 3D elevation of the online world built on the blockchain, composed of the virtual and mixed realities

Virtual Reality:
Computer-generated environment with scenes and objects that appear to be real

+

Mixed Reality:
Blend of physical and digital worlds, that provide 3D human, computer, and environmental interactions

=

Metaverse:
A virtual reality space that allows users to have live interactions and experiences across distance

The Metaverse today

- Currently, what will become the Metaverse is a series of disconnected metaverses
- Meta, Microsoft, Epic Games and NVIDIA are allocating significant resources in building the Metaverse
- Gaming companies like Roblox and Epic Games are the farthest ahead in building metaverses
- Today's metaverse users are mostly kids and teens, presenting a near-term challenge for companies to attract older users

: Source: Mckinsey & Company, Value creation in the metaverse, 2022 Forbes, What is the metaverse and why should you care, 2022

Metaverse | How can it be used to generate social impact?

The Metaverse can be used for the following applications

Immersiveness	**Novel ways of providing high quality training.** The metaverse could provide immersive and engaging learning opportunities in different sectors. Education within the metaverse can also scale access to virtually 'limitless' participants and enhance education delivery and quality.	**Ex in Education:** The Skill Immersion Lab is a program developed by SAP, Talespin and Jobs for the future (American nonprofit), that aims is to give students access to new, immersive learning technologies, to prepare them for the workforce.
Personalized Experiences	**Revolutionizing healthcare**. The metaverse could enable a fully immersive remote telemedicine and online healthcare services without physical barriers. The metaverse in particular VR offers a personalized therapy that, has been proven to be an effective tool to work on mental health.	**Ex in Health: A** study published in Psychiatry Research found that VR therapy can reduce anxiety and depression. According to the study, VR helps patients learn how to manage their symptoms in a personalized simulation, which transfers into the real world.
Scalability	**Scale the provision of public services**. The government's adoption of the metaverse could enhance their performance and productivity, by providing services in advance of the demand and at a larger scale.	**Ex Cities and Urban Development:** Metaverse Seoul, is an initiative from Seoul's metropolitan government (SMG) to build a metaverse platform that will allow citizens to access public services virtually by 2026.

Source: Forbes, What are the effects of the metaverse on society, 2022 Mckinsey & Company, Value creation in the metaverse, 2022 : Talespin, Skill Immersion Lab: SAP, JFF and Talespin Bring Immersive Technology to High School-aged Learners, 2021 Seoul Metropolitan Government, Public Service with "Metaverse Platform" 2021 Apollo Hospitals, In a first-of-its-kind initiative in the healthcare industry, Healio, Virtual reality plays role in mental health treatment, 2022

Metaverse | Example: Metaverse Seoul

서울특별시
SEOUL METROPOLITAN GOVERNMENT

Metaverse Seoul is an initiative from Seoul's metropolitan government (SMG) to build a metaverse platform that will allow citizens to access public services virtually by 2026.

- The metaverse will encompass all areas of municipal administration such as economic, cultural, tourism, educational and civic service

THE PROBLEM

- Seoul seeks to become the first municipal government with a full-service virtual world. The idea emerges as a contactless communication to respond to the needs in the post-pandemic area
- City officials are hoping to build on digital fluency in South Korea, which has a well-established video gaming culture and industry
- Metaverse Seoul aims to position Seoul as a global leader, a safe city, and a city of coexistence

THE TECHNOLOGY

- By the end of 2022 and in 2023 the SMG will provide various business support facilities and services, including the Virtual Mayor's Office, Seoul FinTech Lab, Invest Seoul and Seoul Campus Town, on its metaverse platform
- Seoul's major tourist attractions and lost historical resources will be recreated in the virtual space
- From 2023, Seoul's leading festivals will be held in the metaverse

THE IMPACT

- ✓ Broaden access to public services, by overcoming time, space and language barriers
- ✓ Improve public service provisions for people with disabilities using extended reality technology
- × Isolate people who are not tech savvy to access certain public services
- × Incurring significant costs to maintain a platform that may not be successful
- × Increased potential risk of security breaches

Source: Seoul Metropolitan Government, Public Service with "Metaverse Platform" 2021 Washington Post, Seoul wants to build a metaverse. A virtual New Year's Eve ceremony will kick it off., 2021

Metaverse | Example: SKILL IMMERSION LAB

The Skill Immersion Lab is a program developed by SAP, Talespin and Jobs for the future (American nonprofit), that aims is to give students access to new, immersive learning technologies, to prepare them for the workforce.

THE PROBLEM

- SAP and JFF, identified that employers are demanding skills that are not being taught in regular schools (e.g., emotional intelligence and leadership)
- In response to this issue SAP and JFF launched the Skill Immersion Lab, a program that aims to develop soft and employability skills through new immersive learning technologies
- The consortium led an evaluation in order to assess the impact of the program and the use of impact immersive technology

THE TECHNOLOGY

- The Skill Immersion Lab deployed a curriculum in which students experienced virtual reality training paired with instructor-led guided discussions
- The program was designed as a four-to-six week-long curriculum activated across three national locations that were chosen intentionally based on their diversity
- Students were administered 8 learning modules from Talespin's learning content library utilizing VR technology

THE IMPACT

- ✓ Immersive learning has the potential to build confident communicators
- ✓ The evidence in this study suggest that integrated learning approaches pairing VR and guided discussion produces promising learning outcomes (improved scores)
- × This type of learning can only be accessed by the people who can afford VR technology

Source: Talespin, Skill Immersion Lab: SAP, JFF and Talespin Bring Immersive Technology to High School-aged Learners, 2021

Metaverse | What are the major challenges that need to be addressed?

Regulatory

The lack of solid regulation and governance is a significant deflector for potential users

- It is essential that developers focus on protecting user's privacy as it will collect a lot of personal data, including eye-tracking, physical reactions and haptics
- As more companies become part of the metaverse, there has been an increased need to have a financial regulation that will adhere to the principles in the "real-world" regulation
- As the idea of a metaverse becomes more tangible, discussions have emerged on how and who should regulate crime in the metaverse

Technical

Current virtual challenges need to be tackled before the metaverse can reach its full potential

- The evolution of the metaverse depends highly on virtual and mixed reality technologies and devices. These are not affordable, portable, nor lightweight, making a wide scale adoption of the metaverse difficult
- For the metaverse to be successful, users need to find it worth it to spend money and time in the metaverse. Currently, metaverse developers face the challenge of attracting adult users
- Companies would need to generate value out of the metaverse for it to succeed

Ethical

How do we ensure that the metaverse does not reflect our ethical issues as a society?

- Building a metaverse that is intentional about Diversity, Equity and Inclusion (DEI), will need the participation of diverse profiles as architects and builders, as well as ensuring representation within the metaverse that reflects the diversity of the real world
- Access to the metaverse for users and creators will be limited to those who have access and resources to afford virtual and mixed realities technologies, which can be expensive for low-income households
- Currently, the most popular metaverse platforms (mostly video games) are spaces where violent behaviors are often experienced (e.g., racism). There is a rising concern that as people use these platforms, they will become desensitized to these types of violence

Source: Mckinsey & Company, Value creation in the metaverse, 2022. Forbes, Regulating the metaverse: Can we govern the Ungovernable?, 2022. CNBC, Serious crime in the metaverse should be outlawed by the U.N., UAE minister says, 2022. Forbes, The challenges and opportunities with the metaverse, 2022 Bernard Marr & Co, 7 Important Problems & Disadvantages Of The Metaverse, 2022.

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NFT | What is it?

NON-FUNGIBLE TOKEN (NFT)

Non-fungible tokens are tokens that represent ownership of unique digital assets on the blockchain

- NFTs are non-fungible meaning that they cannot be replicated or replaced.
- NFTs are stored on the blockchain, usually Ethereum, providing traceability and proof of ownership over assets.
- NFTs can be bought and sold using cryptocurrency, reaching a market value of $2B in 2021 Q1

The Internet Today	An NFT Internet
A copy of a file, like an .mp3 or .jpg, is the same as the original.	NFTs are digitally unique, no two NFTs are the same.
Ownership records of digital items are stored on servers controlled by institutions	Every NFT must have an owner and this is of public record on the blockchain
Platforms, such as music streaming services, retain the majority of profits from sales.	Creators can retain ownership rights over their own work and claim resale royalties directly through NFT sales.
Companies with digital items must build their own infrastructure. For example, an app that issues digital tickets for events would have to build their own ticket exchange	NFTs on a blockchain are compatible with anything built using that blockchain. An NFT ticket for an event on Ethereum can be traded on every Ethereum marketplace, for an entirely different NFT.

"This is fundamentally going to change digital ownership, creative structures, the creative economy, how we view money even. This is bigger than the internet"

- Karinna Nobbs, chief executive and experience officer of NFT marketplace The Dematerialised.

Source: Ethereum, Non-fungible tokens, 2022; The Verge, NFTs explained, 2022

Dalberg

NFT | How can it be used to generate social impact?

NFTs can be used for the following applications

Awareness	**Raising awareness for social impact causes:** Certain NFT projects are focused on supporting those from underrepresented backgrounds or raising awareness around impact initiatives (e.g. climate action)	**Ex in Gender:** World of Women focuses on bringing emerging artists and those from underrepresented backgrounds into the Web3 space. Sales from its collection supported women's rights organizations
Raising Funds	**Efficient and transparent fundraising:** A growing number of NFT projects are providing a portion of their profits from NFT sales to charities. Donations that are recorded on the blockchain provides transparency around how and where donations are sent.	**Ex in Health**: The NFT project, Blazed Cats, donated more than $273,000 worth of Ethereum to Mental Health for America
Traceability	**Improving supply chain transparency:** Suppliers can record sourcing information (e.g., packaging information, manufacturing conditions) on the Ethereum NFT blockchain so that brands can monitor sustainability and eco-friendly sourcing practices.	**Ex in Digital and Data:** LVMH, Cartier, and Prada launched a blockchain-based supply chain tracking platform called Aura, which provides consumers greater information and transparency about where raw materials are sourced and manufactured

Source: Forbes, How NFTs are creating social value, 2022; Crypto Altruism, Ten NFT projects and collectives disrupting social impact, 2021; Forbes, What are NFTs and how will they impact global industries, 2022

NFT | Example: Nemus

Nemus sells NFTs tied to land in the Brazilian Amazon and uses the proceeds to purchase and conserve land in the rainforest

- The goal Nemus is to secure enough rainforest properties to form a protective belt within the Brazilian Amazon while implementing conservation and community development initiatives
- Nemus issues forest-themed digital art pieces tied to unique land locations using the Ethereum blockchain

THE PROBLEM

- **The Amazon, the world's largest rainforest, contains vast amounts of carbon**, which is released as trees are destroyed, driving climate change
- In 2022, **deforestation in Brazil's Amazon rainforest reached the highest levels ever recorded** in a January to June period, with 1,540 square miles cleared
- Since Bolsonaro's inauguration in 2019, the rate of deforestation has soared by 92%
- Forming a belt of protected land can deter illegal loggers, ranchers and others aiming to exploit the rainforest.

THE TECHNOLOGY

- **Nemus acquires at-risk land in the rainforest and creates a series of collectible NFTs**, each tied to a unique geolocation within the land.
- A portion of sales from NFTs pays for the purchase of the land, while the remaining proceeds are stored in the Nemus treasury.
- The treasury is then used to fund implementation for economic and social activity on the land, such as harvesting Brazil nuts by local communities
- Collectors of the Nemus NFTs, Guardians, can vote in the Nemus DAO on allocation of funds

THE IMPACT

- ✓ Founded in 2022, **Nemus owns 158 square miles of land with negotiations to purchase an additional 7,700 square miles**
- ✓ In June, **Nemus deployed 110k from their treasury** to fund purchase of equipment to develop sustainable harvest methods of Brazil nuts and increase land security
- × Nemus currently runs on the Ethereum blockchain, resulting in **significant energy usage** through sale of its NFTs

Source: CNN, How to save the Amazon? Brazil company says NFTs are the answer, 2022; Nemus, Welcome to Nemus, 2022; Gizmodo, Nemus' Amazon rainforest NFT puts greenwashing on the blockchain, 2022

NFT | Example: Meta Carbon

Meta Carbon provides social engagement methods such as NFTs that help companies reduce carbon emissions

- Meta Carbon tokenizes carbon offsets and wraps them in engaging animal artwork to make the process of offsetting your carbon emissions more engaging, educational, and transparent
- By fractionalizing carbon offsets in NFTs, Meta Carbon makes it possible to integrate climate solutions into Web3 based games, loyalty programs, and at point of sale

THE PROBLEM

- **The current carbon market is opaque and difficult**: Carbon credits come in several varieties and sold through brokers and middlemen, resulting in difficulty accessing and verifying carbon credits for businesses and the public
- **There is a great need for reduction of carbon emissions**: The UN finds that limiting global temperature rise to 1.5°C would help avoid the worst climate impacts. Yet, global warming is projected to reach around 3.2°C by the end of the century.

THE TECHNOLOGY

- Meta Carbon purchases carbon credits and creates carbon-backed digital collectibles (NFTs) on the blockchain
- Purchasing NFTs triggers automatic retirement of carbon and issuance of your personal certificate
- The other proceeds are passed to high quality registered carbon reduction projects such as forest preservation
- NFTs can also provide governance votes for related DAO's which make decisions such as donation recipients

THE IMPACT

- Meta Carbon launched **Carbon Creatures the world's first NFT dedicated to capturing carbon** on Polygon (99.9% more energy efficient than Ethereum)
    - **Carbon Creatures has offset 1238 tons of CO2**, equivalent to saving 7,737 trees
- Launched in July 2022, the **Digital x Koala NFT collection has already offset 226 tons of CO2**, equivalent to saving 1,412 trees
- Carbon offsets are not the most cost-effective climate intervention so NFT sales may be better spent elsewhere

NFT | What are the major challenges that need to be addressed?

Environmental

Most NFTs are minted on the Ethereum network, which consumes a high amount of energy for each transaction

- Every transaction on the Ethereum proof-of-work platform, including every NFT transaction, uses more than 260 kilowatt-hours of electricity—equivalent to the electricity used by an average U.S. household over 9.05 days. Shifts to chains using much less power-intensive proof-of-stake mechanisms will be crucial for environmental sustainability. Ethereum 2.0's energy consumption will be 99.95% less due to its shift from proof-of-work to proof-of-stake.

Ethical

NFT platforms have already become centralized and exclusive

- OpenSea is the leading centralized platform for creating and selling NFTs, giving them significant control in decisions for the NFT space and pricing power. As of October 2021, OpenSea facilitated more than $600M in trades while the next comparable marketplace, SuperRare, had $6M in trading volume during the same span.
- Small groups of exclusive investors make the majority of profits in NFT collecting through "whitelist" early access to lower prices: Users who make the whitelist gain a profit 75% of the time versus 21% for those who do not

Regulatory

The current NFT markets are full of fraudulent assets and scams such as wash trading.

- Wash trading occurs when a buyer and seller collude to inflate the value of an asset through orchestrated sales at falsely high prices. As of April 2022, wash trading accounted for $18B or 95% of overall trading volume on NFT marketplace LooksRare, according to Bloomberg. Increased regulation will be necessary to control fraud in the NFT market.
- OpenSea found that 80% of items created with its free listing tool were "plagiarized works, fake collections and spam."

Source: Investopedia, NFTs and the environment, 2022; CoinDesk, The NFT market is already centralized, 2022; Bloomberg, The hottest NFT marketplace is mostly users selling to themselves, 2022; Time, The problem with NFTs: A crypto expert responds to a viral takedown, 2022; The Verge, The counterfeit NFT problem, 2022

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DeFI | What is it?

Decentralized finance (DeFi) is an emerging financial technology that uses cryptocurrency and blockchain technology to manage financial transactions.

- DeFi aims to democratize finance by replacing the control that financial institutions have with peer-to-peer relationships that can provide a full spectrum of financial services
- The components of DeFi are cryptocurrency, software, and hardware that enables the development of applications
- The infrastructure for DeFi and its regulation are still under development and debate

Centralized Finance (CeFi)	Decentralized Finance
Traditional CeFi is managed by banks and other financial institutions	DeFi uses a public blockchain, so they don't rely on a centralized system or entity
Traditional CeFi is highly regulated. In the US, regulatory bodies like the Federal Reserve and Congress	DeFi has no regulation
CeFi uses traditional local currency	DeFi is designed to use cryptocurrency for transactions
To access financial services in traditional CeFi, the user will need the financial institution's approval. This decision is based on income level, credit history and other variables.	Anyone can access financial services in DeFI
Financial institutions do not share transaction information with the public	All transactions, data and codes on the blockchain are transparent to everyone

: Source: Forbes, What Is DeFi? Understanding Decentralized Finance, 2022. Investopedia, Decentralized Finance, 2022. 101 Blockchains, What Is Decentralized Finance (DeFi)? A Short Guide, 2021

DeFI | How can it be used to generate social impact?

DeFi can be used for the following applications		
Reducing transaction costs	Unlike CeFi, there are no intermediaries in DeFi, which helps to reduce transaction costs and time. This is particularly useful for receiving remittances, as these usually have high transaction costs.	**Ex Finance and Investment**: XRP is a cryptocurrency designed to make cross-border transactions cheaper, faster, and more accessible for all.
Broadening access to financial services	Since access to DeFi does not require approval from an intermediary organization, access to financial services can be expanded. This is especially beneficial for people with lower income and no credit history or low credit scores	**Ex Finance and Investment:** BitPesa is a digital foreign exchange and payment platform that leverages blockchain settlement to significantly lower the cost and increase the speed of business payments to and from frontier markets.
Transparency	As transactions on the blockchain are open to anyone, donors can track their money more easily. This allows the donor to know exactly what the recipient used the money for, which could encourage further donations.	**Ex. Conflict and Humanitarian Assistance:** Project Unblocked Cash is a program aimed to enable more speed, efficiency, and transparency in financial aid for disaster relief

Source:, Investopedia, Decentralized Finance, 2022. 101 Bitpesa, What is Bitpesa, 2022, WeForum, How decentralized finance will transform business financial services – especially for SMEs, 2021 , ConsenSys, Project Unblocked Cash: Blockchain Case Study for NGOs.

Dalberg

DeFi | Example: Project Unblocked Cash

Project Unblocked Cash is an Ethereum-based Cash and Voucher Assistance humanitarian pilot program led by Oxfam, Sempo and ConsenSys. The program aimed to enable more speed, efficiency, and transparency in financial aid for disaster relief.

THE PROBLEM

- The world's population requiring humanitarian assistance has been growing in recent years due to climate-caused disasters and Covid-19
- As a result, the humanitarian community now needs to assist more people with same or fewer resources
- In response to this issue Oxfam engaged Sempo and ConsenSys to assess the potential in DeFi, to save costs of distributing aid, reduce delivery times, and bring more transparency and accountability in the process.

THE TECHNOLOGY

- The Unblocked Cash solution consists of three key elements:
- e-voucher "tap-and-pay" cards provided to beneficiary households which they can use to purchase goods
- smartphones with an app through which vendors receive payments
- a single-payment online platform where NGOs can disburse funds and monitor transactions remotely and in real-time
- Vendors only needed to connect to the internet once per week
- The balances shown on the mobile app's were in the Vanuatu national currency (VT)

THE IMPACT

- ✓ Transaction costs were significantly reduced approximately ~200%
- ✓ The project demonstrated that donations without any intermediaries are possible utilizing distributed ledger technology
- ✓ Improved traceability of resources
- × Non-Tech savvy beneficiaries may be left out of the programs
- × Increased risk of being hacked

Source: ConsenSys, Project Unblocked Cash: Blockchain Case Study for NGOs. Oxafam, UnBlocked Cash Project: using blockchain technology to revolutionize humanitarian aid

DeFi | Example: XRP for Cross-Border Payments

XRP is the seventh largest cryptocurrency by market capitalization, with a value of $17.2M

XRP is a cryptocurrency designed to make cross-border transactions cheaper, faster, and more accessible for all.
XRP uses the Ripple Network which "offers connections to hundreds of financial institutions around the world via a single API and makes moving money fast, cheaper and more reliable" in comparison to the current leading SWIFT payment infrastructure

THE PROBLEM

- **Remittances account for more than a quarter of GDP in several developing countries** i.e., El Salvador, Nepal, Lebanon, Somalia, Kyrgzstan, and Tonga.
- **However, current transfer methods are expensive and inefficient**. The World Bank found that a remittance of $200 can incur average fees between 5% and 9.3%, These services are expensive due to the cost of complying with Know Your Customer and Anti-Money Laundering (AML) regulations, capital controls, or other restrictions

THE TECHNOLOGY

- XRP uses the Ripple Network on the blockchain rather than the traditional SWIFT payments system which allows transactions to be
  - **Faster**: average transaction to take five seconds to complete
  - **Cheaper**: cost less than a fraction of a cent per transaction
  - **More Accessible**: Ripple's Network enables seamless integration in new regions
- XRP provides cheaper, faster transactions relative to other cryptocurrencies due to **use of a unique node list to validate transactions** rather than a fully decentralized node network

THE IMPACT

- ✓ Ripple has potential to significantly increase the flow of remittances to developing countries: In 2020, global remittances totaled $700 billion, $540 billion of which was sent to low- and middle-income countries.
- × Ripple's consensus mechanism if relatively centralized with use of a unique node list rather than a fully decentralized node network, resulting in security issues and the threat of institutional intervention

Source:

DeFI | What are the major challenges that need to be addressed?

Regulatory

The novel and decentralized nature of DeFi will be difficult to regulate, resulting in uncertainty for users and stakeholders

- In 2020, FinCEN a bureau of the United States Department of the Treasury proposed legislation in December which would require money service businesses to comply with enhanced know-your-customer and recordkeeping requirements. As DeFi protocols can provide neither, integrations with custodial platforms like Coinbase, may become illegal.

Technical

The current DeFi infrastructure experiences vulnerability to hacks and difficulty scaling

- From 2019 to 2021, DeFi platforms on the Ethereum network have lost about $285M (0.65% of total value locked in Ethereum-based DeFi market) due to hacks and exploits, such as flash loan attacks
- DeFi will need more efficient networks to manage growth to a larger scale: Currently, Ethereum can process 15 transactions per second while Visa can process 65,000 per second, though Eth2.0 will increase network speed

Ethical

Greater access to financial services could lead to greater vulnerability to scams and fraud, particularly due to the lack of regulations and understanding of products

- In 2021 alone, cryptocurrency scams and theft in the DeFi sector totaled over $12 billion in crypto assets stolen from user wallets and exchange holdings due to scams such as rug pulls, social media scams, and phishing scams
- Consumers face greater vulnerability to these scams due to the lack of regulatory protection and potential lack of familiarity with the product

Source:

"Technology and how it is harnessed, especially with the emergence of an open internet of value, is the technological contest of our times."

- HBR What is Web3?

Looking ahead…

We invite our partners in the social impact sector to share your thinking and experiences with Web3 in your own work, pose a question, or leave a comment. Your feedback will help us develop other tools to help advance our shared understanding of both the risks and opportunities of Web3 in social change.