Blockchain In Business

Use Cases and Applications

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Dr. Ravi Chamria

- 20+ years experience in IT consulting and tech products spanning across Web3, Fintech, InsurTech, Supply Chain and eCommerce

- Executive MBA from IIM Lucknow.

- Thought leader on emerging technologies like Blockchain, IoT and AI/ML.

Web 3 – Evolution of Internet

Web 1.0: The read-only web

The first version of the Web consisted of a few people creating web pages and content and web pages for a large group of readers.

Web 2.0: The participative social web

Web 2.0 describes the current state of the internet, which has more user-generated content and usability for end-users compared to its earlier incarnation, Web 1.0.

Web 3.0: The read, write, and execute web

Web3 is built on a foundation of the ideas of decentralization, openness, and user utility. It allows computers to interpret information like humans via AI and ML.

1990 - Read

Web 1:
The Information Economy

2000 – Read + Write

Web 2:
The Platform Economy

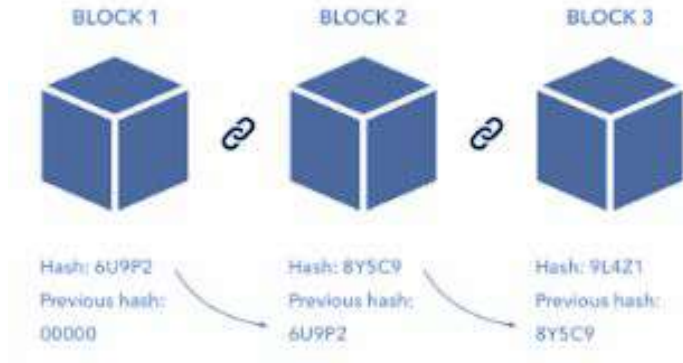**2010 – Read + Write + Execute**

Web 3:
The Ownership Economy

Decentralization

- Web3 is envisioned as returning data ownership to end-users via decentralization.

- The ambition of Web3 is to construct new web protocols and infrastructure that should enable developers to build applications where users bring their own data and identity is no longer bound to any one platform.

- A decentralised web is based on a peer-to-peer network that is built on a user community. Instead of a group of powerful servers, this group's own internet-connected nodes would host websites or apps. Each website or programme is dispersed among hundreds of nodes on various devices.
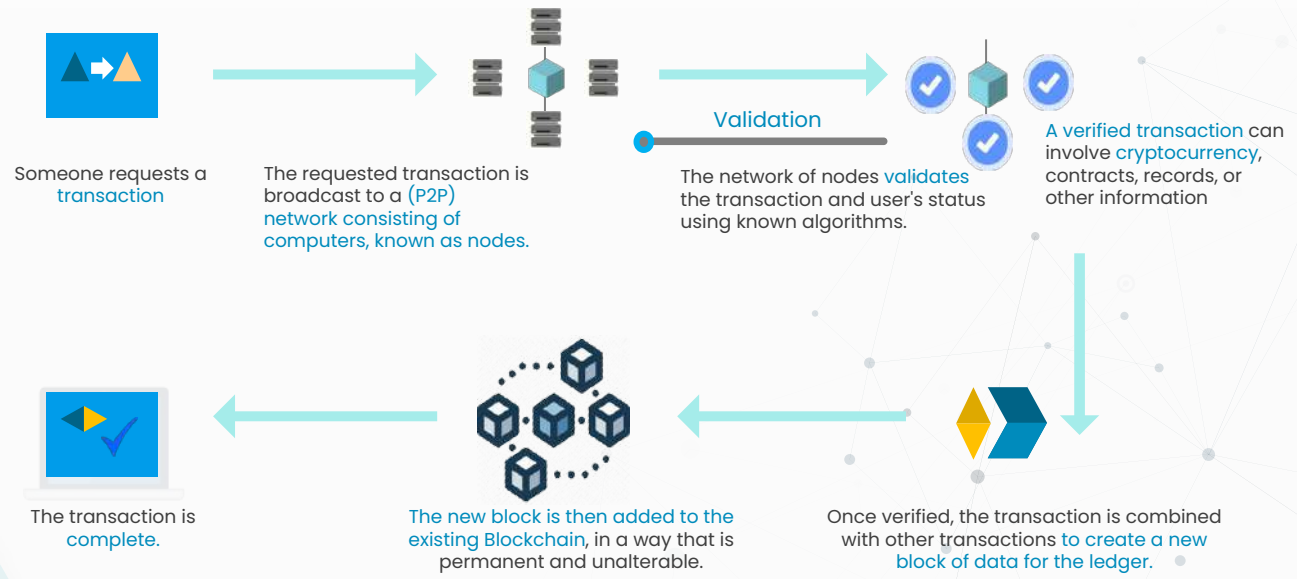
What is Blockchain?

BLOCK 1
Hash: 6U9P2
Previous hash: 00000

BLOCK 2
Hash: 8Y5C9
Previous hash: 6U9P2

BLOCK 3
Hash: 9L4Z1
Previous hash: 8Y5C9

- Block + chain: A block is a set of transactions that happen over the network. The chain is where blocks are linked to each other in a way that the next block contains hash of the previous one.

- Blockchain is a distributed ledger technology that enables digital assets to be transacted and traded in near real time. The record it keeps is permanent and irreversible.
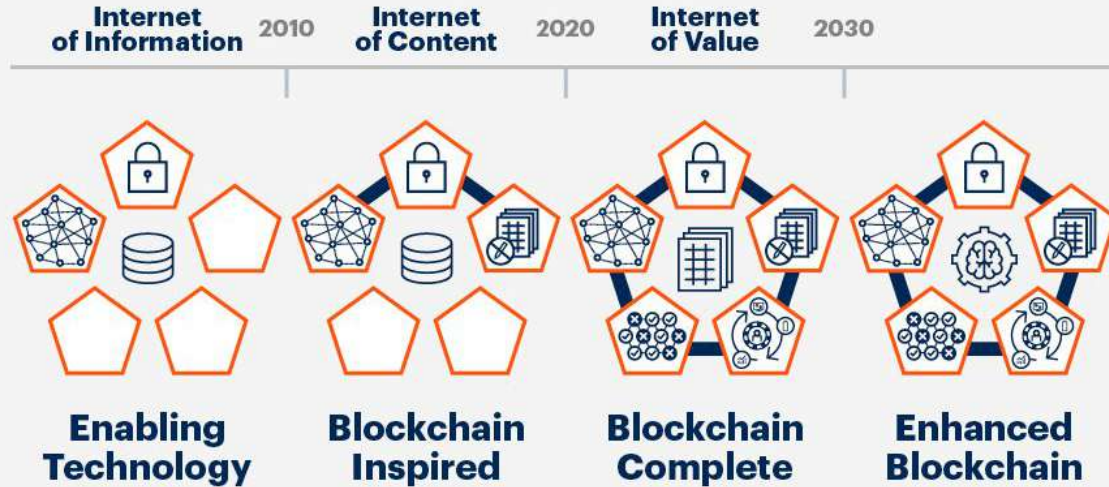
How Blockchain Works

Someone requests a transaction

The requested transaction is broadcast to a (P2P) network consisting of computers, known as nodes.

Validation

The network of nodes validates the transaction and user's status using known algorithms.

A verified transaction can involve cryptocurrency, contracts, records, or other information

The transaction is complete.

The new block is then added to the existing Blockchain, in a way that is permanent and unalterable.

Once verified, the transaction is combined with other transactions to create a new block of data for the ledger.

Gartner Blockchain Spectrum
Predicts Maturity Around 2025

Internet of Information 2010   **Internet of Content** 2020   **Internet of Value** 2030

Enabling Technology

Blockchain Inspired

Blockchain Complete

Enhanced Blockchain
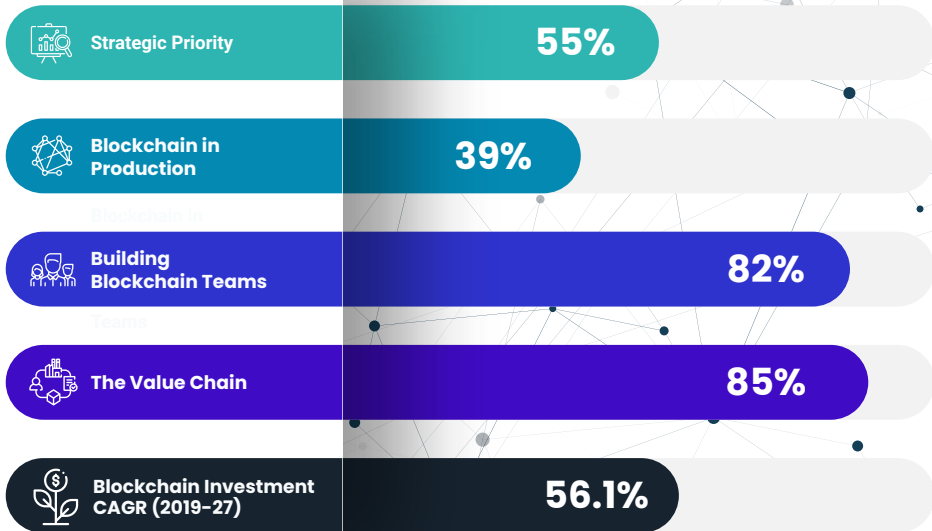
Key Constructs of Blockchain Technology

Peer to Peer Network

Transactions are broadcasted through the network and travel from one node to another

Distributed Shared Ledger

A chronological record of transactions in a distributed ledger (book-of-records) shared across a business network

Smart Contracts

Business logic (rules) embedded in ledger that can be triggered when certain conditions are met
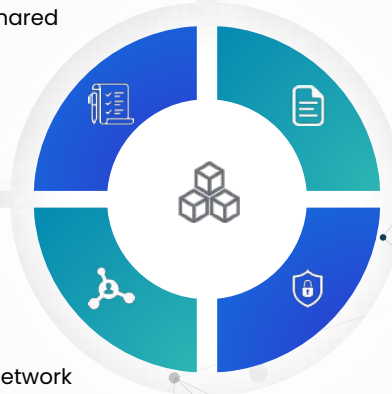
Network Consensus

All participants agree to a network verified transaction by consensus

Security

Asymmetric Cryptography is a central feature, transactions are secure, authenticated & verifiable

Secured Transactions

Transaction stored in the Distributed Ledger

Key Concepts

Public/Shared Ledger

- A cryptocurrency public ledger is a record-keeping system

- The ledger maintains participants' identities anonymously, their respective cryptocurrency balances, and a record of all the genuine transactions executed between network participants.

- Scaling and security concerns are one challenge for cryptocurrency public ledgers and transactions.

Secure (Hashes & Block Hashes)

- A hash is a function that meets the encrypted demands needed to solve for a blockchain computation.

- Hashes are of a fixed length since it makes it nearly impossible to guess the length of the hash if someone was trying to crack the blockchain.

- The same data will always produce the same hashed value.

- A hash, like a nonce or a solution, is the backbone of the blockchain network.

- A hash is developed based on the information present in the block header.

Public Blockchain

A public blockchain is a permissionless blockchain. Anyone may join the blockchain network and read, publish, and participate in the public blocks. Public blockchains are decentralized (no one controls the network) and safe (data cannot be altered once verified).

Benefits of Public blockchain

- Open Read and Write: Anyone can participate
- The ledger is distributed
- Immutable
- When something is written to the block, it cannot be changed
- Secure, due to mining (51% rule)

Permissioned Blockchain

A private blockchain, on the other hand, is one that has been authorized. Authorized networks limit who may use the network and what transactions they can do.

Benefits of Permissioned blockchain

- Enterprise controls resources and access to the blockchain
- Faster transactions
- Better scalability
- Compliance support
- More Efficient Consensus

Distributed & P2P Technology

Client A

Client D

Client B

Client C

Node A

Node E

Node B

Node D

Node C
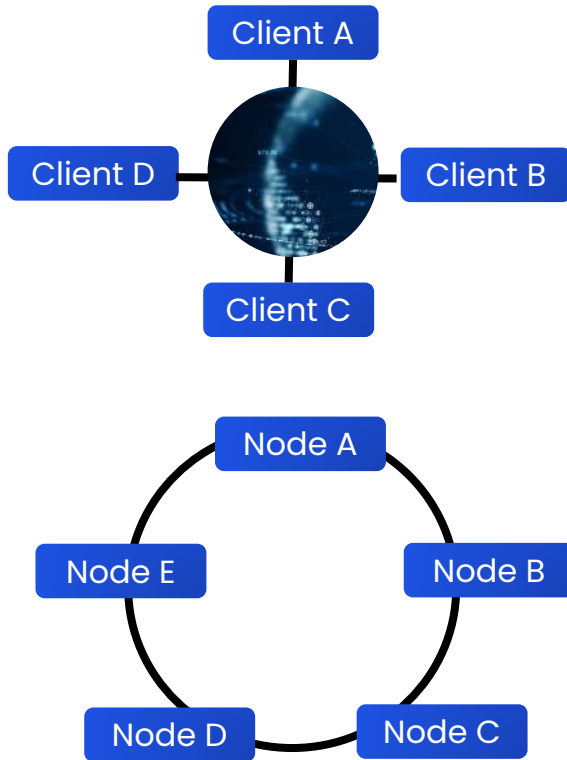
- As a distributed ledger technology, blockchain records transactions as an immutable timestamped digital block that indicates senders and receivers.

- No centralized authority manages the blockchain networks and only the participants can validate transactions among each other.

- The technology allows people and institutions to trust the output without trusting the participants.

Digital Tokens

	Fungible	Non-Fungible
Physical		
Digital		

Traceability
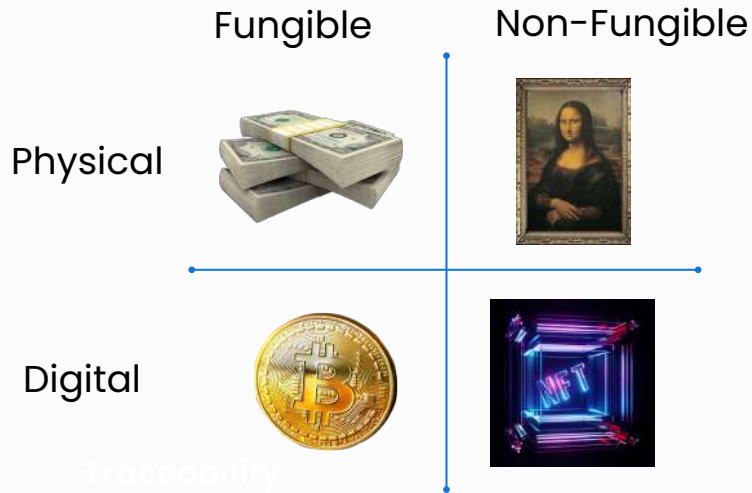
- Crypto tokens are a type of cryptocurrency that represents an asset or specific use and reside on their own blockchain.

- Tokens can be used for investment purposes, to store value, or to make purchases.

- Cryptocurrencies are digital currencies used to facilitate transactions (making and receiving payments) along the blockchain.

- Altcoins and crypto tokens are types of cryptocurrencies with different functions.

- Created through an initial coin offering, crypto tokens are often used to raise funds for crowd sales.

Smart Contracts

- Smart contracts are self-executing lines of code with the terms of an agreement between buyer and seller automatically verified and executed via a computer network.

- Nick Szabo, an American computer scientist who invented a virtual currency called "Bit Gold" in 1998, defined smart contracts as computerized transaction protocols that execute terms of a contract.

- Smart contracts deployed to blockchains render transactions traceable, transparent, and irreversible.

Mining

- By mining, you can earn cryptocurrency without having to put down money for it.

- Bitcoin miners receive bitcoin as a reward for completing "blocks" of verified transactions, which are added to the blockchain.

- Mining rewards are paid to the miner who discovers a solution to a complex hashing puzzle first, and the probability that a participant will be the one to discover the solution is related to the portion of the network's total mining power.

- You need either a graphics processing unit (GPU) or an application-specific integrated circuit (ASIC) in order to set up a mining rig.

Why Blockchain?

Trust

Enables trust between participants who don't know each other.

Decentralized Structure

Enables real-time data sharing among businesses like suppliers and distributors while reducing points of weakness.

Improved Security

Creates an unalterable record of transactions with end-to-end encryption which reduces fraud and unauthorized activity.

Reduced Cost

Creates efficiencies by reducing manual tasks such as aggregating and amending data and by easing reporting and auditing.

Why Blockchain?

Speed

Eliminates intermediaries so transactions are handled faster than conventional methods.

Visibility & Traceability

Tracks the origins of a variety of items such as medicines, to confirm they are legitimate instead of counterfeit and organic items to confirm they are indeed organic.

Immutability

Ensures transactions can't be changed or deleted.

Individual Control of Data

Gives entities the ability to decide what digital data they want to share with whom and for how long, with limits enforced by smart contracts.

Why Blockchain?

Tokenization

Converts value of an asset into a digital token recorded and shared via blockchain. Non-fungible tokens are used to sell digital arts.

Innovation

Leaders across multiple industries are exploring and implementing blockchain based systems to solve intractable problems and improve long-standing cumbersome practices such as verifying the info on a job resume.

How to approach Blockchain?

Blockchain technology is undoubtedly here to stay and will change the face of business as we know it in the next few years. So what can your business do today to prepare for widespread adoption?

- Evaluate your technology and processes to determine where information crosses trust boundaries and your business could benefit from blockchain.

- Identify how the technology can help your customers.

- Learn more about blockchain.

- Get help. Remember, you don't have to develop a solution in-house to take advantage of this opportunity. (Zeeve can help).

zeeve

Blockchain Use Cases

Blockchain Use Cases in Banking & Finance

International Payments

Blockchain provides a way to securely and efficiently create a tamper-proof log of sensitive activity. This makes it excellent for international payments and money transfers.

Capital Markets

Blockchain-based systems also have the potential to improve capital markets. A McKinsey report identifies benefits that blockchain solutions offer capital markets, including faster clearing and settlement, consolidated audit trail
And operational improvements

Trade Finance

Historic methods of trade financing have been a major pain point for businesses because the slow processes often interrupt business and make liquidity hard to manage. Blockchain has the ability to streamline trade finance deals and simplify the process across borders.

Regulatory Compliance and Audit

The extremely secure nature of blockchain makes it rather useful for accounting and auditing because it significantly decreases the possibility of human error and ensures the integrity of the records.

Insurance

Through smart contracts, customers and insurers can manage claims in a transparent and secure manner.

Blockchain Use Cases

Blockchain Use Cases in Business

Supply Chain Management

Blockchain's immutable ledger makes it well suited to tasks such as real-time tracking of goods as they move and change hands throughout the supply chain.

Healthcare

Health data that's suitable for blockchain includes general information like age, gender, and potentially basic medical history data like immunization history or vital signs.

Real Estate

Blockchain can expedite home sales by quickly verifying finances, reduce fraud thanks to its encryption, and offer transparency throughout the entire selling and purchasing process.

Media

Media companies can adopt blockchain technology to eliminate fraud, reduce costs, and even protect Intellectual Property (IP) rights of content – like music records.

Energy

Blockchain can be used to execute energy supply transactions, but also to further provide the basis for metering, billing, and clearing processes.

Blockchain Use Cases

Blockchain Use Cases in Government

Record Management

National, state, and local governments are responsible for maintaining individuals' records such as birth and death dates, marital status, or property transfers.

Identity Management

With enough information on the blockchain, people would only need to provide the bare minimum (date of birth, for example) to prove their identities.

Voting

Blockchain technology has the ability to make the voting process more easily accessible while improving security.

Taxes

Blockchain tech could make the cumbersome process of filing taxes, which is prone to human error, much more efficient with enough information stored on the blockchain.

Non-Profit Agencies

Blockchain could solve the anti-trust problems charities are increasingly facing through greater transparency; the technology has the ability to show donors that NPOs are in fact using their money as intended.

Compliance/Regulatory Oversight

Blockchain can make record updates available to regulators and businesses in real time, in turn reducing time lags and allowing red flags and inconsistencies to be spotted sooner.

Case Studies

Academia

Insurance

Trade Finance

Supply Chain

Healthcare

P2P Power Trading
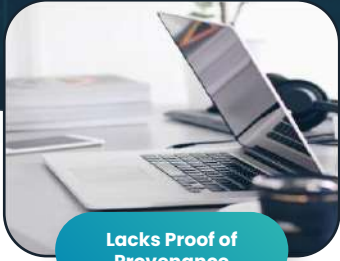
Case Study - Academia

Blockchain In Academia

Blockchain can be used to store academic certificates and credentials

It is the most advanced, secure and decentralized technology to store the ever-living certificates providing secure and fast verification across the g!obe.

With the use of blockchain, we can enable transparent consortium network.

Challenges

Lacks Proof of Provenance

Traditionally issued certificates lack proof of provenance at speed.
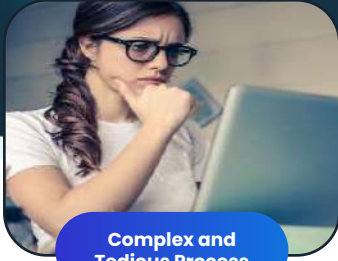
Complex and Tedious Process

Current process takes days to issue and verify the credentials

Greater Cost of Managing

Issuance and Verification are still manually driven. Hence are stark costs
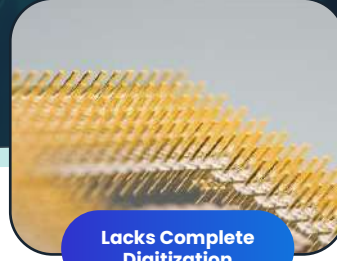
Lacks Complete Digitization

Records aren't completely paperless and not ever living

Prone to Frauds & Forgeries

Security loopholes makes the exiting certificates prone to Frauds

Solution

Digitize

Create Digital Proof of Evidence over Blockchain

Authorize

Cryptographically signed and Smart Contract driven.

Optimize

Faster issuance and verification processes on decentralized leger.

Advantages

Digital Issuance

Digitally issue, upload or use templates to create one.

Fast Verification

Quick validation and Verification with complete Provenance

Integrate

Easy API connectors to Integrate with Legacy applications

Secure Share

Smart Contract based secure permissioning and access control
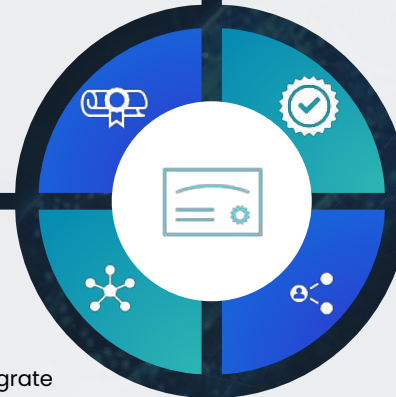
Workflow

Issue and manage certificates via the Hyperledger module

Broadcast hashed documents on Ethereum (Proof of Evidence)

One time cost of ever living record or evidence

Unlimited verification across the globe and entities in Real-Time

Public Blockchain

Proof of Certificate

Proof of Certificate

Proof of Certificate

Proof of Certificate

Proof of Certificate

Proof of Certificate

Proof of Certificate

Proof of Certificate

Storing generated hash

Pushing Proof of certificate

Certificate Issuer

Certificate Issuer

Blockchain

Hash Hash Hash Hash

Hash Hash Hash Hash

Certificate Metadata

View/ Verify Transaction Details

Owner/ verifier

View/Download /Print

Owner/ verifier

Business Model

Transaction Led

- One-Time Implementation Fee
- Integration with Legacy application
- Customization
- Deployment
- Training – User and Technical
- Per Certificate/Record Fee
- Annual Maintenance Fee
- Training
- Audit Support

CAPEX

- License Fee
- One Time Implementation Fee
- Integration with Legacy application
- Customization
- Deployment
- Training – User and Technical
- Annual Maintenance Fee
- Training
- Audit Support

Case Study – Insurance

Insurance

Claims can automatically be settled for Parametric Insurance Products using Digital Platform powered with Blockchain and Smart Contracts.

Use Cases

Crop Insurance
Claim settlement for Weather Based Crop Insurance

Motor Insurance
Claim settlement for motor insurance products

Health Insurance
Claim settlement for specific ailment health insurance products

Key Areas Impacted:

Enables Paperless Insurance Issuance and Claim settlement process

Improves Customer Satisfaction by reducing the role of customer in claim process

Reduce/Eliminate Human Errors

Provide best in class support service

Challenges

Claim events are stored in different silos

Lack of Data availability and sharing

Manual Claim Processing

Managing Activities like KYC, Fraud Check etc

Blockchain based Automated Claim Settlement solution

Tokenization of Insurance Policy:
A policy can be tokenized that acts as programmable code and stored immutably on Blockchain

Link & Assign Properties:
Customer Demographics, Claim Criteria, Medical professional etc

Verification
Since these properties are all linked to the Digital Passport and are not just mere stamps or images, they assist in the chain of verification.

Automated Claim Settlement
So the claim criteria encoded in the Policy Smart Contract is matched with the real events to trigger claim.

Re-Insurance
The portfolio of tokenized policies can be reinsured with complete data and authenticity

Integration with Legacy Apps
API Layer to integrate with legacy applications and databases

Automated Claim Settlement Solution

- It minimize paper work by allowing the insured to upload the documents via apps.

- A Smart Contract of the insurance agreement made between the insurer/third-party and the insured.

- The Smart Contract is coded to get executed autonomously, if specified condition(s) are met.

- An insurer can drastically reduce operational cost involved in collecting & storing documents and processing claims

Policy Purchased
Customer buys the policy.

Smart Contract
Enters into Smart Contracts, as per the T&C.

Claim Filed
File claim, uploads images of medical receipts via Mobile app

Contract Execution
Mobile App's OCR function extracts information from medical receipts that is validated.

Payout Processed
Claims payout is triggered in customer's bank account, on successful contract validation.

Every Information Getting Recorded on the Blockchain

Crop Insurance

Weather based crop insurance can completely automate the claim settlement process.

It also helps the farmers and brokers to buy insurance policies seamlessly through mobile or web app without the need of submitting long proposal forms.

Smart Contracts for automated claim settlement

Third party weather data providers, for triggering Smart Contracts

Tokenize the policies so that policies can change hands in re-insurance domain with security and transparency

Policy Purchased

Weather Data Inputs

Customer clicks notification

Claim Filed

Apply via Mobile or Web App
Applies for digital policy.

Smart Contract
is made on the Blockchain based on Policy's T&C

Weather Data
Smart Contract fetches data and executes based on Policy T&C

Contract Execution
Policy smart contract executes the Payment Contract

Payout Processed
Claims payout is triggered in customer's bank account, on successful contract validation.

Every Information Getting Recorded on the Blockchain

Motor Insurance

With blockchain, motor insurance can make the claim settlement possible on the spot based on pictures uploaded of the damaged vehicle via Mobile App.

For the cases with claim amount less than INR 20,000, damage is external and visible on the body of the vehicle

Since more than 60% of the claims are under INR 20,000, deploying Insurra can drastically reduce effort and enhance efficiency

Customer needs to do a self survey of the vehicle by uploading the damaged vehicle's pictures along with the requisite claim documents

Self Survey
Customer upload pics of the damaged vehicle with claim documents

Recommendation
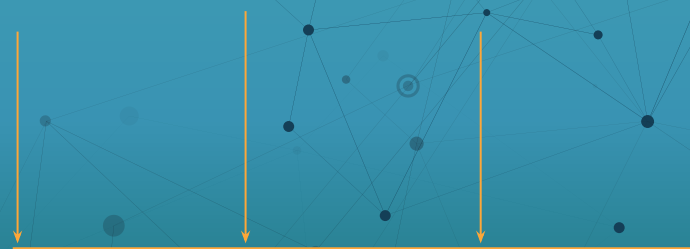Based on data analytics tools, the solution will suggest liability to the customer

Customers Approval
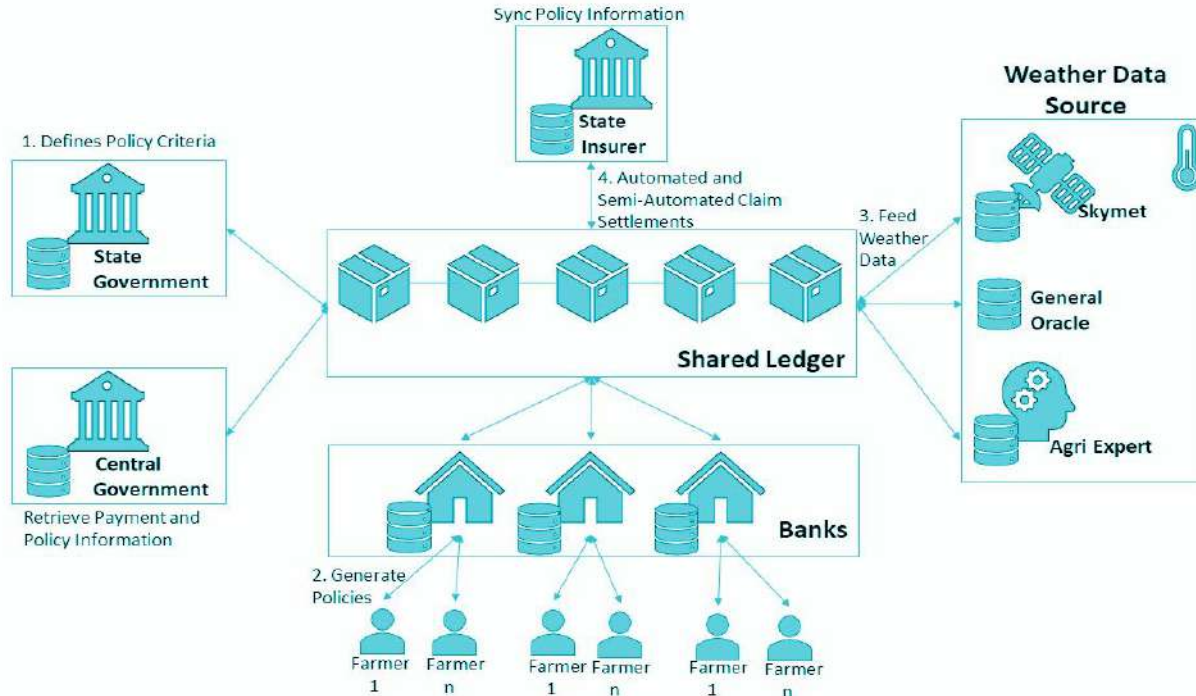The customers needs to give his approval on the suggested claim amount

Payout Processed
After customer consent, claims will get approved and payment will get credited to customer's bank account

Every Information Getting Recorded on the Blockchain

Functional Architecture

Case Study - Trade Finance

Digital Transformation In Financial Services

IT Investment in Banking

The Digital Banking Ecosystem

By **2021**, global banks' **IT budgets** will **surge** to **$297 B**

Tech giants like **Google** and **Amazon** are earning up to **50%** of the **$1.35 T** in **US** financial services revenue from incumbent

35% of all bank revenues could be at **risk** from more tech-savvy competitors as soon as 2020

Mobile banking is expected to grow at a **CAGR** of **2.83%** between **2019** and **2024**

Fintech Investments

Global FinTech funding tops $24.6B in 2019 YTD

Annual global VC-backed FinTech deals and financing, 2015 – Q3'19 ($B)

Year	Deals	Funding
2015	1,235	$16.96B
2016	1,400	$19.72B
2017	1,699	$18.83B
2018	1,967	$40.63B
2019 YTD	1,387	$24.6B

CBINSIGHTS
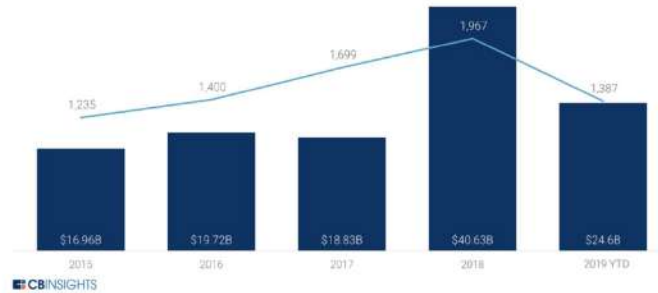
Falling Short

- Legacy Infrastructure
- Slow Processes
- Intermediaries
- Audits

Falling Short Trade Finance

A bank payment obligation, or BPO, is a digital alternative provided by Swift.
BPO uses automated data checking of standardized data sets, rather than stacks of paper.

MT 798 has been in place for eight years..
An authenticated message service to exchange trade data between companies and member banks of Swift,.

Limited Reach
as digitalized only a slice of the trade process

Too Bank Focuse
Banks mainly invested in digital trade channels and back-office systems

Too many changes
Banks asked too many changes by companies to understand and accept a new risk playbook

Falling Short Trade Finance

01 **Trade Finance Gap**
s estimated at about **$1.5 trillion** as per ADB. This could reach **$2.5 trillion** by 2025 according to the World Trade Organisation (WTO)

02 **Paper Based & Manual**
From the 34 days of shipment, 10 days were due to waiting for documents – Maersk Test
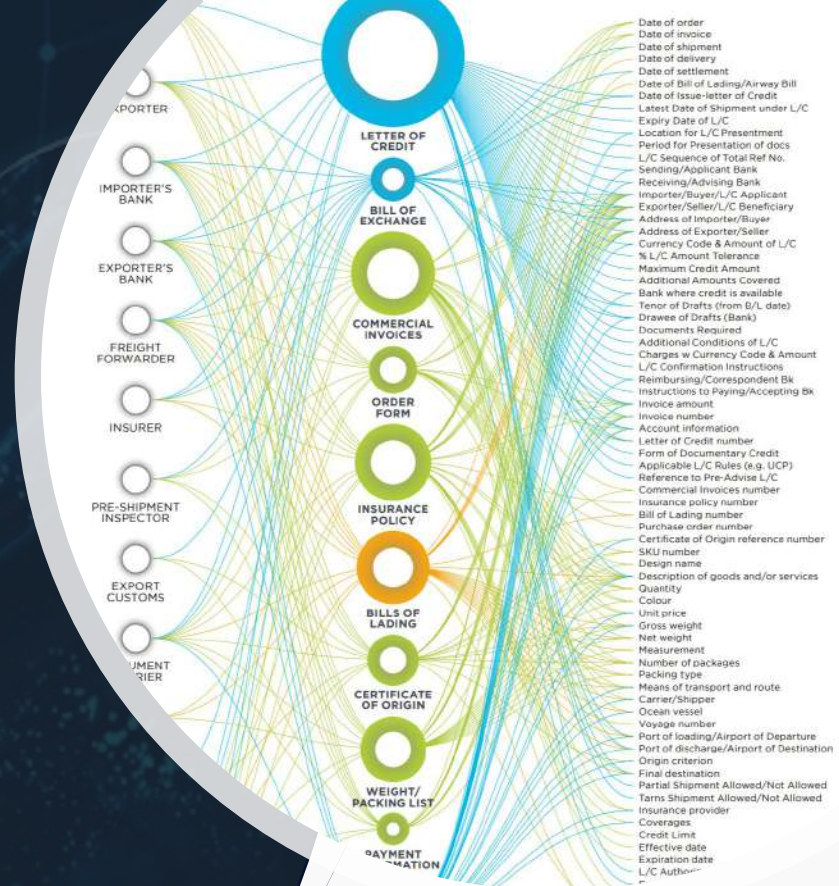
03 **Siloed & Disconnected Systems**
There is not one platform where all the parties can connect among each other

04 **Highly Risky & Costly**
The absence of transparency results in a lack of trust and consequently a high-risk assessment and costs.

As per BCG report, the players create about 5000 data field transactions in a Single Transaction

Blockchain In Trade Finance

Trade finance represents the financial instruments and products that are used by companies to facilitate international trade and commerce.

Exporters

Quickly distributed sources rather in empowered.

Importers

Quickly distributed sources rather in empowered.

Participating Banks

Quickly distributed sources rather in empowered.

Shipping and Logistics

Quickly distributed sources rather in empowered.

Customs/Regulatory Bodies

Quickly distributed sources rather in empowered.

Insurers

Quickly distributed sources rather in empowered.

TradeTech
TECHNOLOGIES LTD

All Commodities Trading Partner Solution

Blockchain Platform For The Most Efficient Trading Experience

Trade Finance Current Process

The current process uses technology systems but they are siloed and disconnected

Establish Payment Terms

Deliver Goods

Settle on Terms
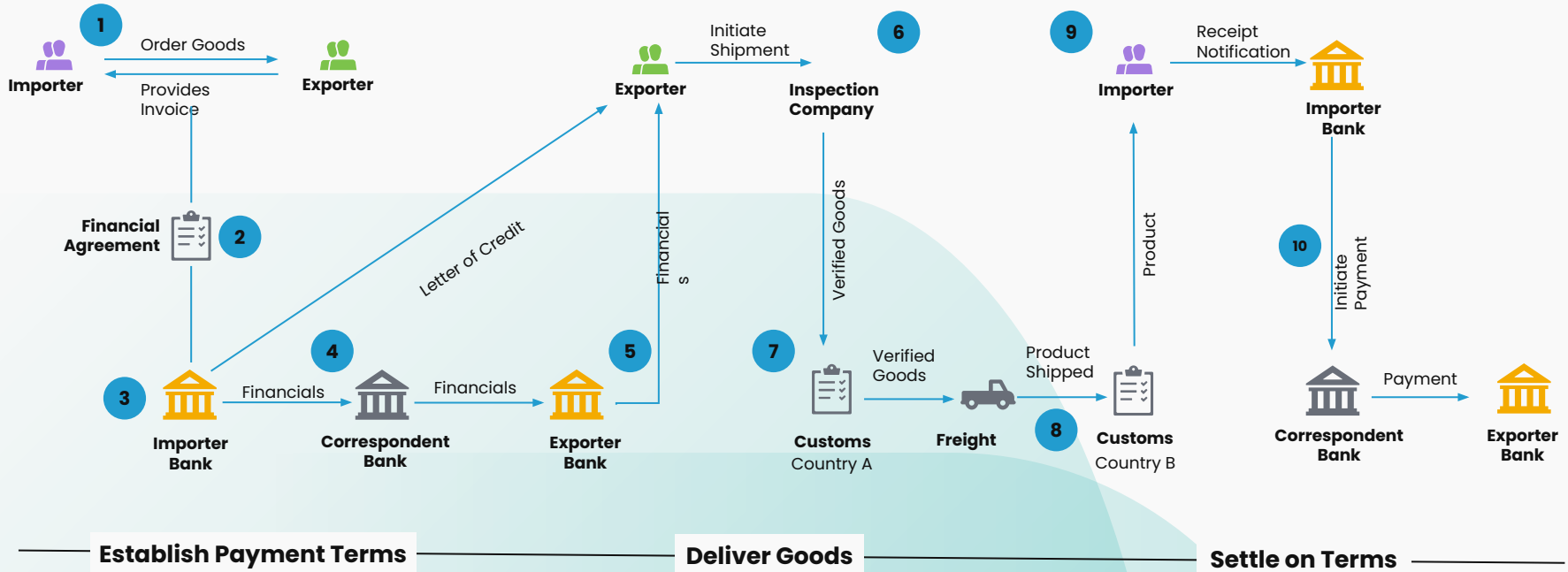
Trade Finance Pain Points

The current process uses technology systems but they are siloed and disconnected

Importer — Order Goods / Provides Invoice — **Exporter**
(1) (2)

Financial Agreement

Exporter — Initiate Shipment — **Inspection Company**

Importer — Receipt Notification — **Importer Bank**
(7)

Letter of Credit

Financials

Verified Goods

Product

Initiate Payment

Importer Bank — Financials — **Correspondent Bank** — Financials — **Exporter Bank**
(3) (4)

Customs Country A — Verified Goods — **Freight** — Product Shipped — **Customs Country B**
(5) (6)

Correspondent Bank — Payment — **Exporter Bank**
(8)

Establish Payment Terms

Deliver Goods

Settle on Terms

Trade Finance Blockchain Based

The Blockchain Ledger and Smart Contracts is creating a network with seamless sharing and transparency

Establish Payment Terms

Deliver Goods

Settle on Terms
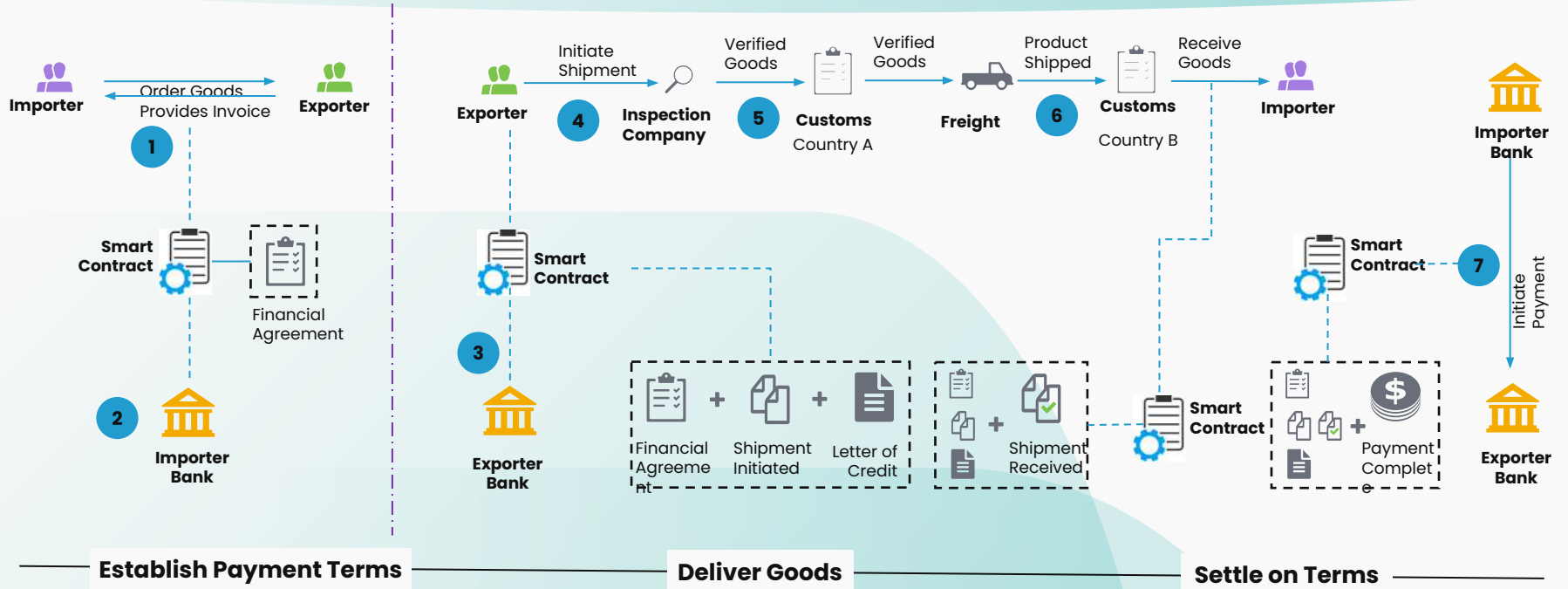
BLOCKCHAIN DISRUPTING TRADE FINANCE

With Open, Decentralized, Secure and Trustless Network, Blockchain truly disrupts

Automation through blockchain could reduce letter-of-credit processing time by 80%

Letter-of-credit processing time, indexed

100

UCP* and other condition checks — Review and release

Create transaction

Receive and validate application

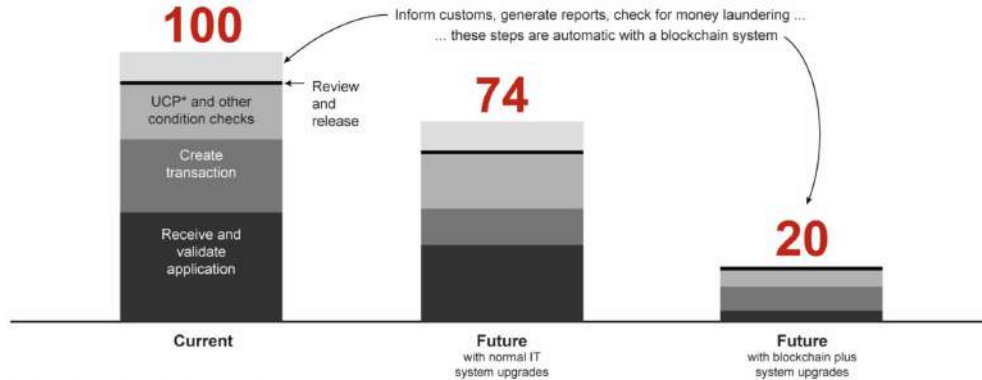Inform customs, generate reports, check for money laundering ...
... these steps are automatic with a blockchain system

74

20

Current

Future
with normal IT
system upgrades

Future
with blockchain plus
system upgrades

*Uniform Customs and Practice for Documentary Credits
Sources: Bain & Company; HSBC

- Faster turnaround times
- Lower processing costs
- More trade financing made available
- Faster financing decisions
- Faster supply chain decisions
- Transparency of steps and status
- Accurate representation of each record
- Freed-up working capital

Case Study - Supply Chain Management

Customers are demanding greater trust, supply chain transparency and auditability.

There are three types of business affected most by counterfeiting

Brand

Retailers

E-commerce Platforms

Impact of Counterfeiting

- Loss of revenue, especially resale (10% of sales)
- Loss of market share
- Damage to brand
- Lack of trust from consumers

Why Blockchain?

Allows brands to show path of a product from raw goods, to manufacturer, to distributor, to retailer, to consumer and even then to the resale market

Why Blockchain for Supply Chain ?

- Supply chains
- Intragroup reconciliations
- Interorganizational reconciliations
- Industry record-keeping

Distributed Marketplace
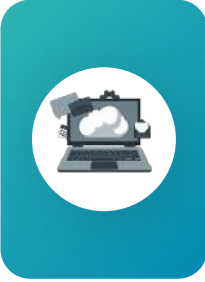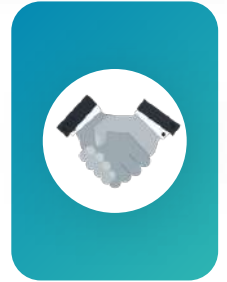
Small Infrastructure

Digital Identity

Blockchains in the **financial world** provide what is called **"digital continuity."**

In **supply chain**, most exchanges bring together different parties that **have no reason to trust one another**.

Blockchains play a key role here and can help **eliminate duplicative and error-prone transactions —** helping create a **digital identity**.

Blockchain can Provide a Solution

Structural features

Technology for sharing Information

... which allows for **multiple parties ...**

... whose entries are **verified** and, therefore, **trusted ...**

... forming a **public record** visible to all

What it means for supply chain

... such as the origin and authenticity of goods...

... including manufacturers, customers, suppliers ...

... meaning customers can trust third parties ...

... so all parties have access to data around a good ...

Common benefits

Decentralized

Multiple writers

Trust through design and rules

Not deletable

Multiple owners

Synchronized "real time"

Verified through mutual consensus

Chronological chain of activity

Blockchain Opportunities across the Supply Chain Ecosystem

Planning and Forecasting
- Demand forecasting and planning

Procurement and manufacturing
- Procurement ecosystem
- Carrier contract management
- Manufacturing ecosystem

Supply chain financials
- Carrier payment
- Customer billing
- Driver pay

Chain of Things

Raw materials → Supplier → Manufacturer → Distributor → Retailer → Consumer

Chain of Things

Visibility
- Control center
- Vendor-managed inventory (stock-keeping unit)

Asset Management
- Lease management
- Insurance management
- Maintenance management

Execution and operations
- Brokerage and freight forwarding (international trade)
- Digital bill of lading (BOL)
- Trade compliance

Allows enterprises to more securely and transparently track physical goods as they move from one node to another in a supply chain.

Works on the concept of digitalising physical good by capturing and storing key elements of a physical asset in the form of Digital Passport.

Digital Passport is formed by the aggregation of information, added by many stakeholders, in each step of the Supply Chain
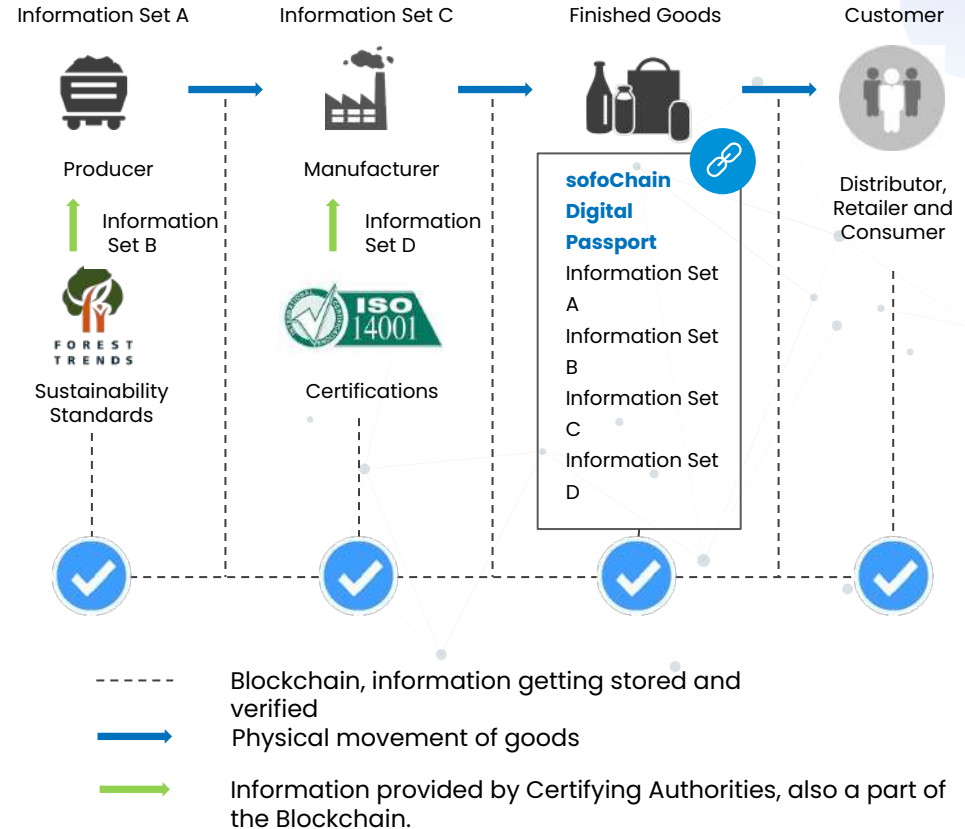
This information is agreed upon by all members of the Blockchain network.

Once there is an agreement, it becomes a permanent record that can't be altered.

Supply Chain Tracking Solution

Information Set A	Information Set C	Finished Goods	Customer

Producer

Manufacturer

sofoChain Digital Passport
Information Set A
Information Set B
Information Set C
Information Set D

Distributor, Retailer and Consumer

Information Set B

Information Set D

Sustainability Standards

Certifications

- - - - - - Blockchain, information getting stored and verified

Physical movement of goods

Information provided by Certifying Authorities, also a part of the Blockchain.

Enables tracking and verification of good and eliminates fake or counterfeit goods/invoices in the supply chain by following means:

Create Digital Passport of Physical Assets: for the quantity and transfer of assets as they move between supply chain nodes, thus avoiding any fake or counterfeit products and verifying the chain of custody.

Link & Assign Properties: like serial numbers, bar codes, color, quality, etc.

Verification: Since these properties are all linked to the Digital Passport and are not just mere stamps or images, they assist in the chain of verification.
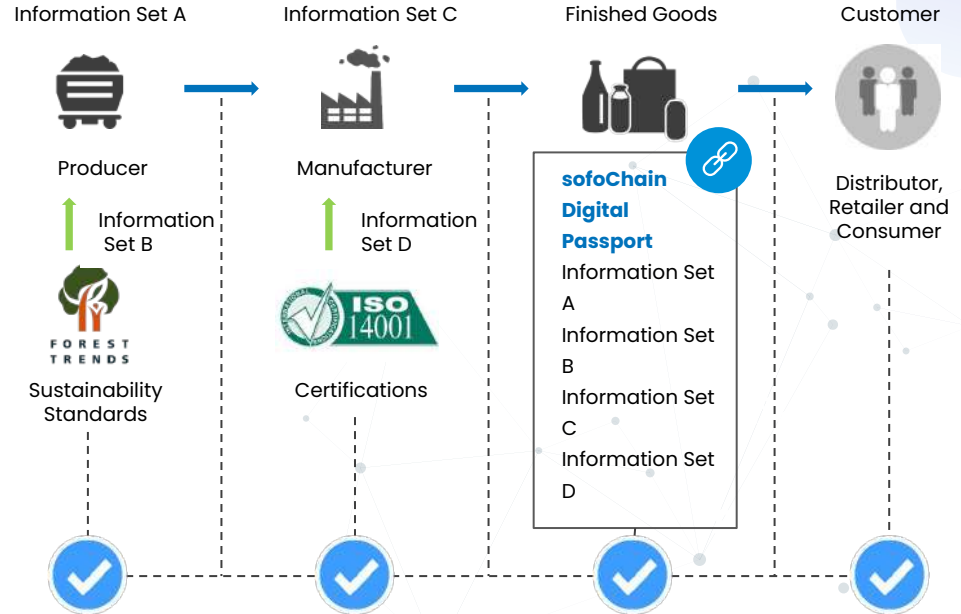
Track & Trace: So that the poor products can be traced back to various stages of the supply chain through which it has passed.

Eliminate Double Spending: By tracking purchase orders, change orders, receipts, shipment notifications and other trade-related documents.

Supply Chain Tracking Solution

Information Set A	Information Set C	Finished Goods	Customer

Producer → Manufacturer → Finished Goods → Customer

Producer

Information Set B

Sustainability Standards

Manufacturer

Information Set D

Certifications

sofoChain Digital Passport
Information Set A
Information Set B
Information Set C
Information Set D

Distributor, Retailer and Consumer

- - - - - - Blockchain, information getting stored and verified

→ Physical movement of goods

→ Information provided by Certifying Authorities, also a part of the Blockchain.

Challenges in Healthcare

Lack of Individualized assessment and care

Individualized care can help better diagnosis, treatment & care for patients. It will also reduce side-effects of medicine and treatment.

Fragmented Health Services

Health data contained in legacy systems is siloed and difficult to share with others because of varying formats and standards

Lack of Patient Centricity (passive user)

With patient mobility comes the need for information mobility. In order to be provided with the best care patients not only can but must have control over their own data.

Limited Capabilities of Doctors

Regulations and budgets limit doctor's   capability to understands current physiology.
Suggested Treatment based on purely doctor's memory and experience.

Security Risks to Patient Data

Individual not being control of their own data leads to lack of privacy in commercial health data. e.g., Fitness tracker

Symptomatic Treatment

Due to high healthcare fees and time consumption in diagnosis, symptomatic treatment has become very prominent.

Lack of Transparency leading to:

Increasing Costs
Insurance Fraud
Record Tampering

High Cost and Efforts

Lack of collaboration in between various medical institutes results in redundant activities and wastage of funds. Thus, increasing cost through out the value chain

Slow progress in Medical Research

Lack of population wide medical data prevents researchers from making patterns in data and understanding the diseases.

Blockchain Network In Healthcare

Control over Data

1. Blockchain provides the user, being the owner of their own medical records, full access and control over their data
2. Option to share data with the ecosystem partners easily via mobile.
3. Audit log of all access to data

New data points explosion like Wearables, Diagnostics, IoT etc.

1. Integration with EMR records for holistic picture and care

Health Insurance and Transparency

1. More transparency about patient data to Insurers for accurate assessment
2. Incentivize the patients for achieving health goals

Tokenized Medical Researches and Patents

1. Incentivize individuals and institutes to perform medical research by creating NFT of their patent and research.
2. The decentralized EMR provide automated suggestions to doctors based on the latest research patents available.
3. Usage of these techniques and medical research will yield tokens to creators.

Clinical Trial Recruitment

1. Recruit patients for clinical Trials through automated smart contracts running over the Blockchain ledger while maintaining privacy.

Better Diagnosis and Care

1. Run AI models on medical history of patients for easy diagnosis and better treatment suggestions.
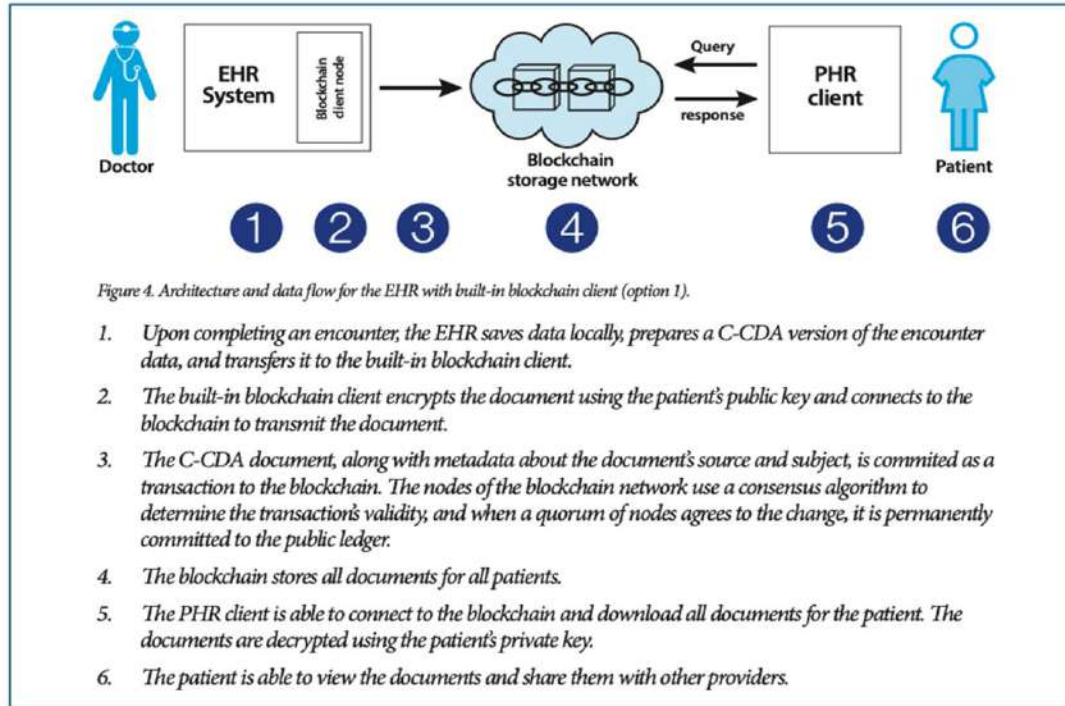2. Collate experiences from millions of patients to provide best treatment and care.

Medical Research via Collaboration

1. Allow institutes to collaborate on similar research via blockchain network.
2. Avoid redundant activities across institutes to optimize cost and better output.

Research on untreatable diseases and Disease Outbreak Detection

1. Detect epidemics and pandemic before time and contain them by running automated smart contracts which recognize patterns in decentralized EMR ledgers.
2. Assist in medical research such as cancer by creating patterns on individual patient attributes.
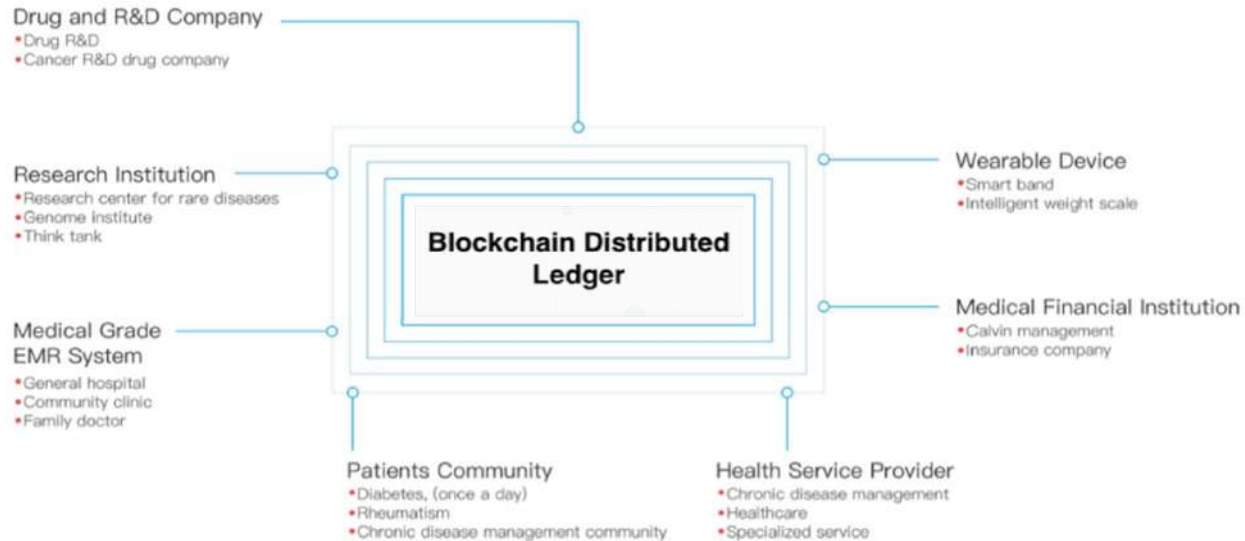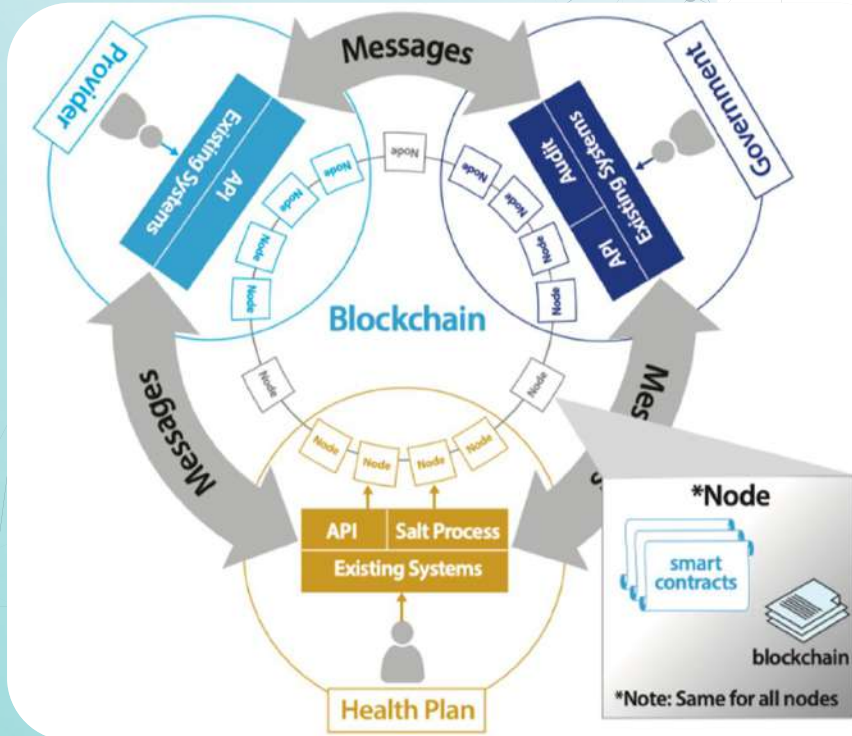3. Use this data to run AI models.

Patient Data Flow

Figure 4. Architecture and data flow for the EHR with built-in blockchain client (option 1).

1. Upon completing an encounter, the EHR saves data locally, prepares a C-CDA version of the encounter data, and transfers it to the built-in blockchain client.

2. The built-in blockchain client encrypts the document using the patient's public key and connects to the blockchain to transmit the document.

3. The C-CDA document, along with metadata about the document's source and subject, is commited as a transaction to the blockchain. The nodes of the blockchain network use a consensus algorithm to determine the transaction's validity, and when a quorum of nodes agrees to the change, it is permanently committed to the public ledger.

4. The blockchain stores all documents for all patients.

5. The PHR client is able to connect to the blockchain and download all documents for the patient. The documents are decrypted using the patient's private key.

6. The patient is able to view the documents and share them with other providers.

Automated Health Claims Adjudication

Conceptual Blockchain Health Care Ecosystem

Health Organization Direct information to the Blockchain

- Health Organizations provide services to patients
- Clinical Data is Tracked in existing Health IT Systems
- Standard Data Fields and a Patient's Public ID are Redirected to the Blockchain Via APIs

Transactions are Completed & Uniquely Identified

- Each Transaction is stored on the Blockchain Containing the Patient's Public (Non-identifiable) ID
- Smart Contract Processes Incoming Transactions

Health Organization and Institutions Can Directly Query the Blockchain

- Health Organizations and Institution Submit their Queries Via APIs
- Non-Identifiable Patient Information (e.g. age, gender, illness) is Viewable
- Data can be Analyzed to uncover New Insights

Patients Can Share Their Identity with Health Organizations

- The Patient's Private Key Links their Identity to Blockchain Data
- The Private Key can be shared with New Health Organizations
- With the Key Organizations Can then Uncover the Patient's Data
- Data Remains Non-identifiable to those without the Key

673.70

218.57

Healthcare Service

- Health Monitoring
- Diet and Exercise Guidance
- Customized Service for Chronic Disease Management

Medical Service

- Intelligent Diagnosis and Referral
- Global Medical Referral
- Course Tracking and Postoperative Rehab
- Clinical Trials

Drug Traceability and R&D

- Supply Chain Traceability
- Data sharing for R&D with compliance to Privacy and Security of data

Medical Insurance

- Faster Policy issuance and claim settlement
- Personalized Insurance care

Case Study – P2P Power Trading

The Problem

Energy Deficit

Resources are priceless and Power generation is still not enough to meet the needs

Centralized

Regulated though but the ecosystem is controlled by certain stakeholders only

Transparency

A Peer to Peer system operating upon transactions requires trust between participants

Cost & Quality

How to ensure efficient supply of electricity in terms of cost and quality through local generation
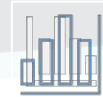
Disputes

Payments and transactions aren't near real-time and data in silos is prone to disputes

Solution

Smart Contract driven peer to peer power trading platform independent of the physical flow of power, a near real time token-based settlements between producers, discom and consumers

Peer-to-peer transaction in a secured and reliable way with proper accounting and billing mechanism.

Decentralize

Every bit of unit counts meaningfully in respect of energy sharing

Authorize

Equal participation & federated network to ensure trust and transparency

Monetize

Blockchain based wallets to allow near Real Time settlements without disputes
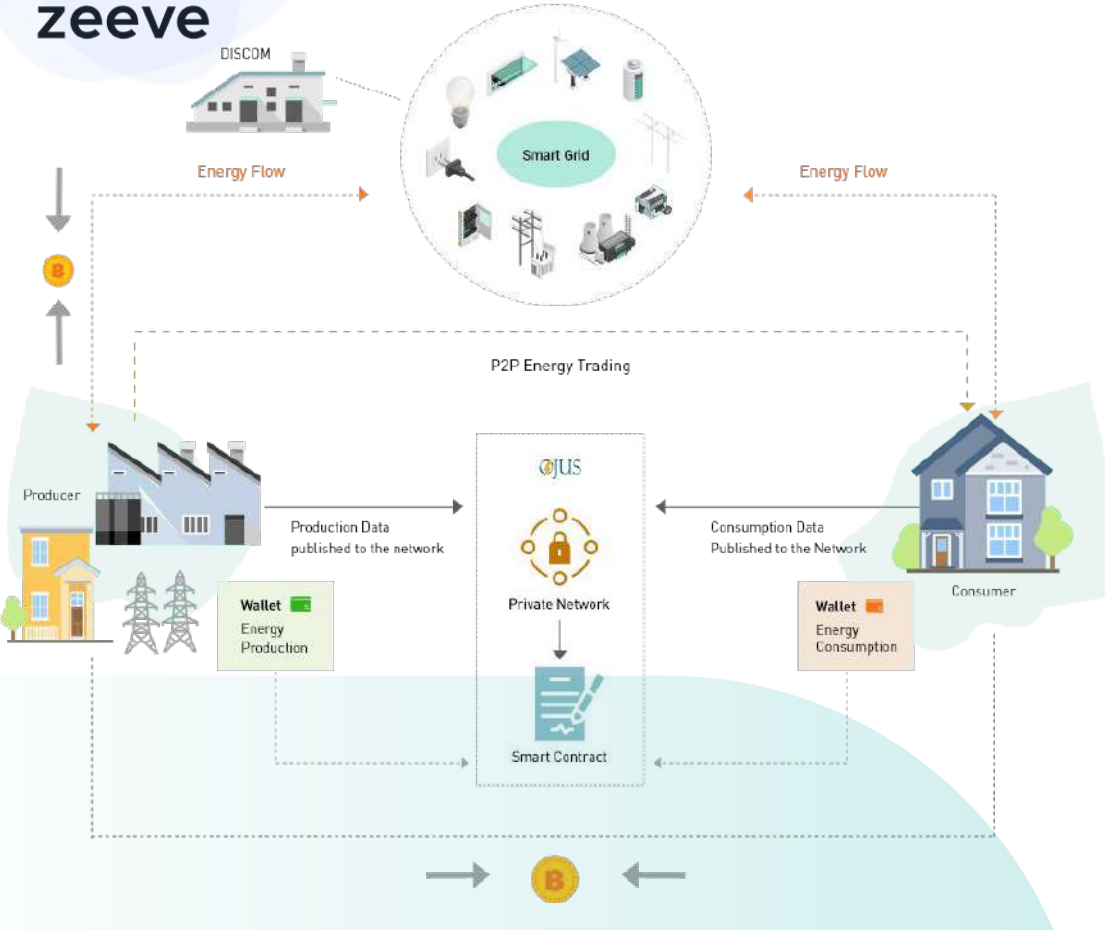
Architecture

A high level system architecture

Functional Workflow

Excess amount of units to be captured and recorded with timestamp on to the Blockchain based ledger.

All the Prosumer will be queued up in the Ledger state for the settlement to happen at a later stage.

Every unit entry in the queue is allowed to be stored up to maximum of 30 minutes. Post 30 minutes the units retained will be considered sold to DISCOM and appropriate token settlement will take place.

Ledger having all the records of unit production and based upon consumption by each consumer the token settlements will be done.

The settlement will be as per following parameters:
- Units Registered once produced.
- Time when units were registered.
- Cost of units set by prosumers.
- Upper limit of the cost being set by consumer.
- The units which are consumed.
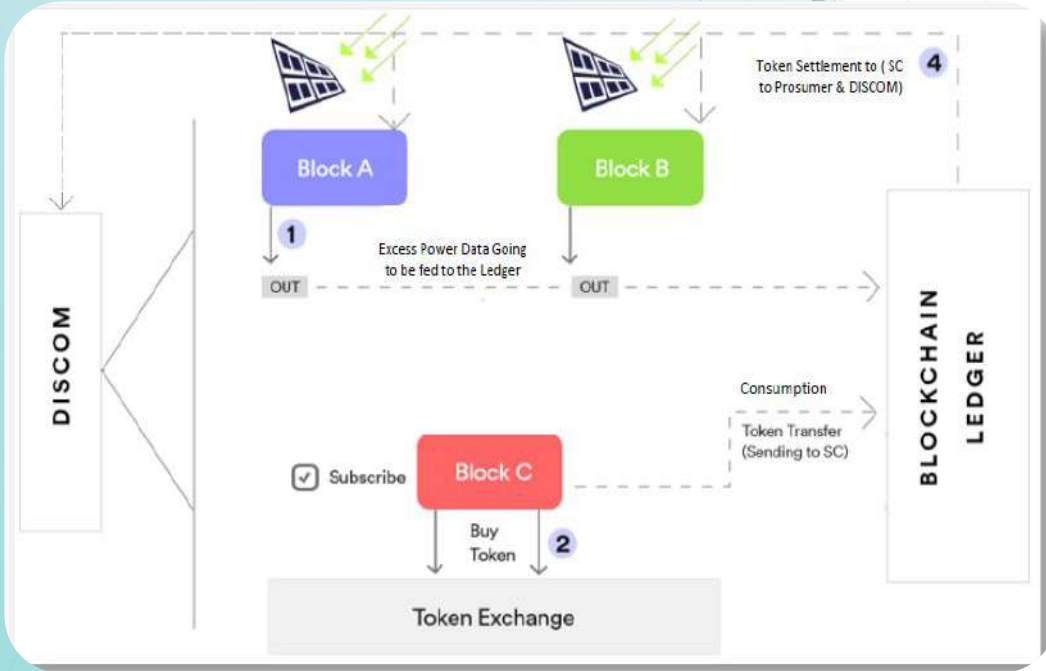
Transaction Workflow

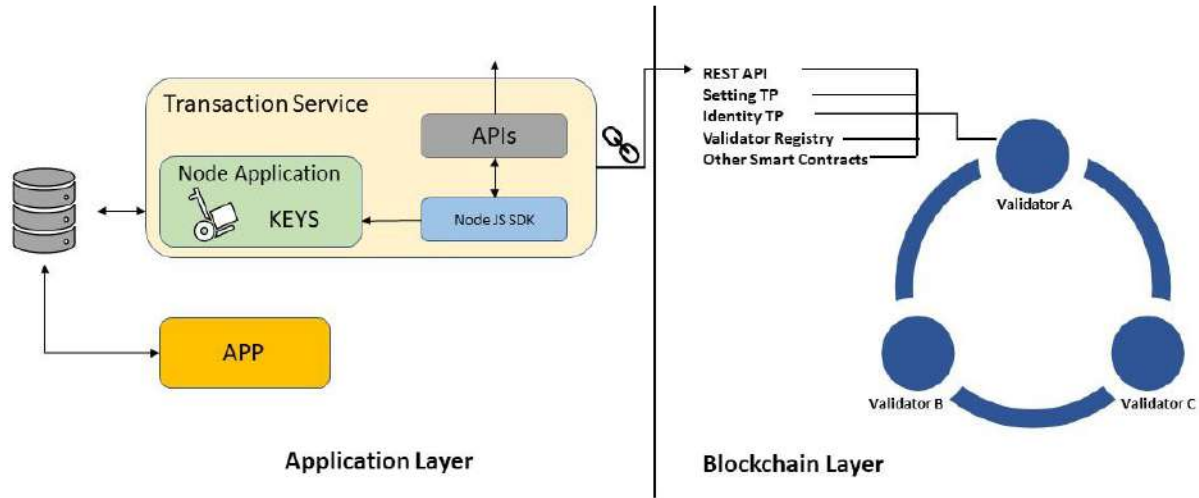DISCOM incentive on every Buy/Sell transaction.

Token will only be transferred to Smart Contract at the time of consumption and settled to prosumers by a decided formula.

Parameters which are to be considered:
- Units Registered once produced.
- Time when units were registered.
- Cost of units set by prosumers.
- Upper limit of the cost being set by consumer.
- The units which are consumed.

All the transactions will be registered over Blockchain.

Blockchain Architecture

zeeve

Transaction Service

APIs

Node Application

KEYS

Node JS SDK

APP

REST API
Setting TP
Identity TP
Validator Registry
Other Smart Contracts

Validator A

Validator B

Validator C

Application Layer

Blockchain Layer

Peer-to-Peer Energy Trading

Peer to Peer transaction:

All transactions were stored on a network of nodes consisting of nodes of the provider and customer participating in a transaction, as well as of the nodes of many other network participants.

POC Objectives

- To understand times of excess energy generation and the quantum in the region.

- Technical feasibility of using Blockchain for peer to peer energy transactions and the optimum model

- Financial viability of performing peer-to-peer energy transactions using fixed pricing model

- To develop optimum settlement mechanism using blockchain.

Benefits

- Promotes Solar roof-top based local generation.

- Promotes multi-directional trade of electricity in same geographic region to minimize T&D loss for conveyance of electricity.

- An opportunity for decentralization of power.

- Allow subscribers to choose their source of energy supply at a better price from a cleaner fuel

- Promotes competition in energy trading

- Reduce cost of electricity to the consumer by local generation
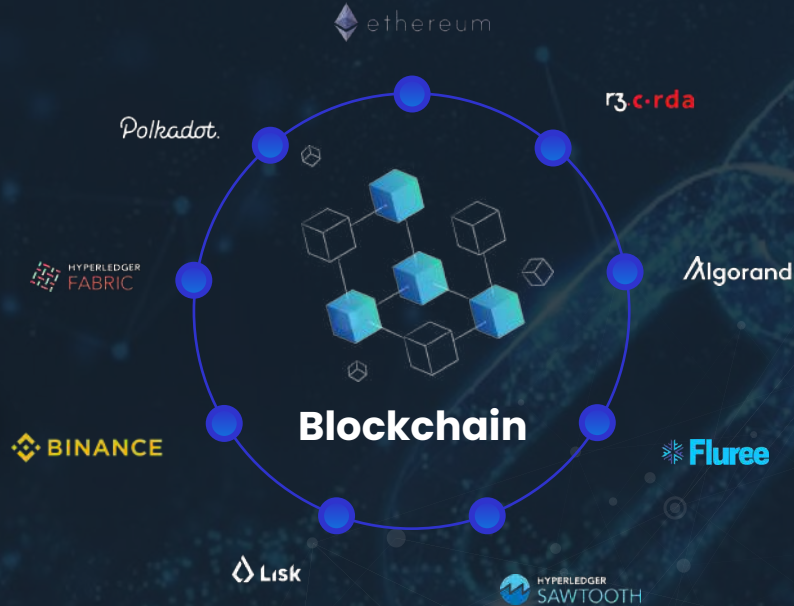
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Zeeve is one of the leading innovator in the Blockchain space. Our full-stack Blockchain Platforms and Products help developers build next-generation networks and enable enterprises to launch more powerful Web3 distributed infrastructure and applications.

Trusted by the World's Leading Organizations

intel | vodafone | AXIA
Deloitte. | WRITER INFORMATION | SUTHERLAND
DCB BANK | PLAAK | aws

Blockchain

ethereum
r3 c·rda
Polkadot
HYPERLEDGER FABRIC
Algorand
BINANCE
Fluree
Lisk
HYPERLEDGER SAWTOOTH

5+
Years of Blockchain Experience

75+
Technology & Subject Matter Experts

4+
White labelled and on-premise deployments

30+
Blockchain Production Deployments

25+
Ready Blockchain Products, Extensions and Plugins

10,000+
Zeeve BaaS Platform Users

Early Traction

Zeeve BaaS Platform is trusted by 10,000+ developers and 25+ Enterprises and Blockchain Consortiums

Early Traction & Customers

Partners & Associations

Zeeve has partnered with the key organizations across the world...

HyperLedger Foundation

Linux Foundation

Microsoft

EEA

R3 Corda

Fluree

Writers Information

Deloitte

Intel

DragonChain

Valid

Blockchain Development and Consulting

Blockchain infra automation platform Zeeve raises $2.65 mn in seed round

Funding led by Leo Capital and Blu Ventures, proceeds to be used to bolster product development, augment tech team and enhance reach among DApp developers and global corporations

Topics
funding | Blockchain | Startups

Companies Overview   GO

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Shashank Pathak   June 14, 2022   Snippets

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ABOUT AUTHOR

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Shashank is leading the Snippets section for Entrackr where he covers daily news and important development on startups and emerging internet businesses. A graduate from VBU, Jharkhand, Shashank started his career at TechMahindra. He can be reached at Shashank@entrackr.com

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Blockchain and Web3.0 based startup Zeeve raises $2.65 million in a seed funding round

The startup plans to use the fresh funds for bolstering product development, augmenting the technology team, and enhancing its reach among decentralised application developers and global corporations

Written by FE Digital Currency

June 14, 2022 8:17:43 pm

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Blockchain and Web3.0 based startup Zeeve raises $2.65 million in a seed funding round

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Zeeve raises $2.65 million in funding led by Leo Capital

dated: Jun 14, 2022, 02:27 PM IST

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Glossary

Airdrop
A marketing strategy in which cryptocurrency projects distribute their native tokens straight to their customers' wallets in order to raise awareness and acceptance.

Alpha
Important or insider knowledge, notably about the value of digital assets such as cryptocurrencies and NFTs; a measure of an investment's return over and above that of the market or other benchmark.

Altcoin
Formerly used to describe any cryptocurrency that wasn't Bitcoin; however, altcoin is now used to describe any new cryptocurrency with a low market valuation.

Alts
An abbreviation for altcoins.

Ape
Someone who invests significantly in a cryptocurrency or stock, or the act of investing excessively in a cryptocurrency or stock. This might be a response to excitement and FOMO, or it can be done without a thorough understanding of the asset. It's worth noting, though, that this is often a self-assigned phrase with no negative meaning. Is this a Planet of the Apes allusion? Perhaps an allusion to monkeys' incredible physical strength? The beginnings are a little hazy, but one thing is certain: apes work well together.

ATH
Stands for All-Time High (noun) is the highest price ever paid for an asset.

ATL
Stands for "All Time Low" and refers to the lowest price an asset has ever had.

Bear market
A period of fall in a financial market is referred to as a bear market.

Bearish
Refers to having a gloomy opinion of a market or asset's worth, akin to a bear market. If you're bearish on a cryptocurrency, you think its price will fall over time.

Bitcoin
World's first decentralised, peer-to-peer digital money, founded in 2009 by Satoshi Nakamoto.

Block
Collection of transactions that have been published to the blockchain. Every block carries information about the block before it, allowing them to be linked together.

Blockchain
Decentralised digital ledger that allows users to store and transmit data without the need for a central authority. Blockchains are the foundational technology for cryptocurrency systems such as Bitcoin and Ethereum.

Block Explorer
A tool for viewing information on a blockchain, including as transactions, wallet addresses, market caps, and hash rates.

Bridge
A protocol that allows different blockchains to communicate with one another, allowing data, coins, and other information to be transferred.

Bull market
The period in which market prices are increasing.

Bullish
Having an optimistic opinion that a market or asset will grow in price, is akin to a bull market. If you're a Bitcoin bull, you think the currency's value will rise over time.

Burn
The act of withdrawing tokens from a cryptocurrency's circulating supply by transferring them to an inaccessible wallet address is known as burning.

Centralised
A hierarchical organisation in which power and control are concentrated among a small set of decision-makers.

CEX - Centralized Exchange
A cryptocurrency exchange controlled by a centralised firm or organisation: Coinbase, Gemini, and Kraken, for example.

Coin
A cryptocurrency developed on its own native blockchain and designed to serve as a store of value and medium of exchange inside that ecosystem. Ex: BTC, ETH, etc.

Collateral
Any asset that is accepted as collateral for a loan, such as real estate or a digital asset like an NFT.

Cold wallet

A device that stores cryptocurrencies offline. Cold wallets are either physical devices or sheets of paper that carry a user's private keys. Cold wallets are considered a safer way of keeping cryptocurrencies since they are not linked to the internet.

Consensus

The condition of agreement among the nodes on a blockchain. For new transactions to be confirmed and new blocks to be added to a blockchain, consensus is required.

Consensus Mechanism

the mechanism through which nodes on a blockchain agree on a transaction or the network's state. Ref: Proof of Stake and Proof of Work.

Cryptocurrency

A digital asset meant to be used as a means of trade and exchange. Unlike centralised banks or governments, cryptocurrency is borderless, safe, and maintained by blockchains.

DAO - Decentralized Autonomous Organization

An entity that is managed by its users and is built on open-source technology. DAOs are often focused on a single project or objective, and they substitute the old hierarchical processes of legacy organisations for blockchain-based principles.

Dapp - Decentralized Application

A blockchain-based application built on open-source code. Dapps live independently of centralised organisations or individuals, and they often reward tokens to incentivise users to keep them up to date.

Data

Any information entity on the internet, such as name, age, location, interests, browsing history, and so on. Web3 intends to secure this sensitive information and return control to the user.

Due Diligence

Practise of performing your own study before investing in a cryptocurrency, stock, or other asset. It's critical to do your own due diligence rather than relying on what someone else says or does.

Decentralized

A system that runs without the supervision of a central person or authority, instead relying on a peer-to-peer network.

Degen

Derived from the phrase "degenerate gambler." While degen still refers to those who make dangerous bets, it may also apply to anybody who works in the crypto and financial industries. This is a self-assigned word, similar to "ape," and does not have a negative meaning. Degens are proud folks who like trading crazy call options on GME, buying the dip before paying their bills, and aping into shitcoins on occasion.

Decentralized Finance

An ecosystem of peer-to-peer financial instruments based on public blockchains that do not need the usage of banks. DeFi applications are designed to be open and networked, enabling them to work together.

DEX - Decentralized Exchange

A blockchain-based peer-to-peer cryptocurrency exchange. Instead of an intermediate person or centralised organisation, a DEX is managed by its users and smart contracts. Ex: Uniswap, 1inch, Sushiswap, etc.

Diamond Hands

An expression that implies you are highly optimistic on a certain asset and have no intention of selling despite market turbulence.

Difficulty

The amount of computational power required to validate transactions and mine blocks on a proof-of-work blockchain.

Difficulty Bomb

The process of making a proof-of-work blockchain more difficult to use in order to encourage users to switch to a different consensus method (such as proof-of-stake in the case of Ethereum).

DYOR stands for "Do Your Own Research."

This term, like DD, is used to urge consumers to do their own research about an asset before investing in it.

Ethereum Improvement Proposal (EIP).

A common framework for submitting a new feature to the Ethereum community.

Ethereum Request for Comments (ERC)

A standard smart contract framework that Ethereum-based smart contracts are built on.

Ethereum

Ethereum is a decentralised application platform built on top of a public blockchain. Ethereum is a turing complete language that allows users to create and deploy sophisticated, self-executing smart contracts on the blockchain.

Fiat

A currency (like US Dollar) introduced as a legal tender and is supported and regulated by a government entity.

FOMO

FOMO stands for "Fear Of Missing Out." A sensation of anxiety coming from the loss of an opportunity. This generally happens when investors acquire an asset after it has already seen a significant price gain, expecting to get in and out before a downturn occurs.

Fork

Changing the protocol of a blockchain is called forking it. It results in a soft fork when the modifications are small. When the modifications are more fundamental, a hard fork may occur, resulting in the development of a second chain with its own set of rules.

Fractionalising

To fractionalize the process of securing an NFT in a smart contract and then breaking it into smaller pieces that are distributed as fungible tokens. This decreases the cost of ownership and enables a community to own artwork and other digital assets.

FUD

Fear, Uncertainty, and Doubt (FUD) news about an asset that seems to be unfavourable but turns out to be erroneous or exaggerated.

Full node

A full node is a blockchain node that records the whole history of the blockchain as well as validates and relays transactions.

Fungible

Interchangeable with anything of a similar kind.

Gas

On the Ethereum blockchain, gas is the cost paid by a user to complete a transaction or execute a smart contract. This cost is determined by the transaction's complexity as well as the network's current demand.

Genesis Block

A blockchain network's very first block is known as the Genesis Block.

Gwei

Gwei is an ether denomination that is used to calculate Ethereum gas pricing. 1 ether = 10^9 gwei

Hard Fork

A hard fork is a major modification to a blockchain that is incompatible with the present protocol and necessitates the creation of a new chain.

Hashing

Hashing is the process of taking any size input and turning it into a fixed-length fingerprint. Using a unique identifying code, hashing enables a collection of data to be encrypted, saved, and remembered. This is the foundation of blockchain technology, enabling for the safe verification and storage of data and transactions.

Hash rate

The pace at which a computer can create guesses to a cryptographic problem is known as hash rate, or hash power. On a proof-of-work blockchain, the hash rate may also refer to the total amount of power consumed by the whole network.

HODL

A phrase that means "hold" and is commonly interpreted as an abbreviation for "Hold On for Dear Life." This phrase originated as a mistake on the Bitcointalk.org forum, when a member indicated that he was "HODLING" his bitcoin as the price fell. The misspelling became popular quickly and is still in use today.

ICO - Initial Coin Offering

The sale of tokens to the general public in order to generate funds for a crypto-based business is known as an ICO. ICOs are a kind of crowdfunding that is comparable to a typical company's initial public offering (IPO).

IEO - Initial Exchange Offering

An initial exchange offering, like an initial coin offering, or ICO, is a technique of selling tokens to generate funds, but with more regulation. An IEO is operated by an existing cryptocurrency exchange, unlike an ICO, which sells new tokens directly to the public. IEOs aim to make the ICO process more safe by partnering with a well-known and recognised exchange.

Light node

A blockchain node that just downloads enough data from the blockchain to process and validate transactions is known as a Light Node. Light nodes, unlike full or master nodes, do not record the whole history of a blockchain.

Liquidity

The ease with which an item may be purchased, sold, or exchanged in a specific market or on an exchange can be termed as liquidity.

Liquidity Pool

A pool of user-provided money that are locked inside a smart contract to make trading on a DeFi platform easier.

Market Cap

The overall worth of an asset based on its current market price is known as its market cap. The market capitalization of a cryptocurrency is calculated by multiplying the price of a single coin by its circulating supply.

Master Node

A master node is a blockchain node that validates and transmits transactions, records the blockchain's entire history, and may vote, control the network, and perform other specialized roles.

Metaverse

A simulated digital environment that combines augmented reality (AR), virtual reality (VR), blockchain, and social media principles to create areas for rich user interaction that mirror the actual world.

Mining

Mining is the process of confirming transactions, arranging them into blocks, and then adding blocks to the blockchain under a Proof of Work system. Miners are those who participate in this procedure.

Minting

Minting is the process of confirming and certifying info on the blockchain, such as domain ownership.

To the moon

This term suggests that the value of an asset will rise to the point that it will literally reach the moon. This is practised by shills during a bull market.

Moonboy

Moonboy is a nickname used to describe excessively enthusiastic social media "financial gurus" who are continuously emphasizing how a specific asset (mostly cryptocoins) is "heading to the moon!"

NFT

A non-fungible token (NFT) is a digital certificate of authenticity that is used to allocate and verify ownership of a single digital or physical item. NFTs are not convertible with each other, unlike fungible tokens.

NFT domains

NFT Domains are blockchain-based domain names that enable users to establish their Web3 username.

NGMI

The acronym NGMI stands for "not going to make it." This term is used to indicate that a project or asset has a low likelihood of becoming valued. This may also be aimed against a specific person, notably someone who has made a disastrous investment or transaction.

No-coiner

No-coiner is a word used to describe someone who does not own any cryptocurrencies or is inexperienced with cryptocurrency in general.

Node

Any device that is linked to a blockchain network is referred to as a node. Different nodes have different degrees of responsibility and may be used to verify transactions, maintain the blockchain's history, transmit data, and perform other tasks. Nodes join together to construct the network's architecture since blockchains are dispersed peer-to-peer networks.

Oracle

Oracle is a service that provides data from the outside world to smart contracts. Because smart contracts can't access data outside the blockchain, they depend on oracles to retrieve, validate, and deliver external data.

P2P
A dispersed network of two or more computers that connect directly without the need of a central server or organisation.

Private Key
A private key is an alphanumeric passcode that may be used to withdraw funds from a blockchain wallet and to approve digital transactions. Because these private keys are lengthy and difficult to recall, wallets usually pair them with a recovery phrase.

Proof of stake
Proof of Stake (PoS) is a consensus process in which validators, or nodes, stake a certain amount of bitcoin on the blockchain in order to validate transactions and mint blocks. If a validator confirms a fraudulent transaction, they will lose a piece of their investment.

Proof of work
Proof of Work (PoW) is a consensus process in which miners are required to solve challenging mathematical problems in order to validate transactions and mint blocks. When a miner solves a challenge properly, they acquire permission to mint the next block and collect the block reward.

Public Key
This is an alphanumeric code that acts as the address for a blockchain wallet, comparable to a bank account number.

Pump and dump
A pump-and-dump strategy is one in which a cryptocurrency or other asset is pumped up, causing many people to acquire it and drive up its price. Those that hyped the asset then sell their interests when the price increases for a brief period of time. This causes a quick selloff, with everybody who did not sell losing money.

Rug Pull
Rug pulls a scam when a crypto enterprise takes the cash entrusted in its system and runs with them. Rug pulls may also happen in assets with a centralised ownership structure.

Rollup
Rollup is a scaling technique that tries to increase transaction throughput while lowering costs by batching several transactions off-chain and then sending them as a single transaction to the main chain.

Satoshi
Satoshi is the lowest unit of Bitcoin, equaling 0.00000001 bitcoin.

Seed Phrase
A seed phrase is a set of words that is used as a master password to access a cryptocurrency wallet. Because a single wallet may hold numerous accounts, each with its own private key, a seed phrase makes it simple to log in to all of them using the same password.

SHA-256
The Secure Hashing Algorithm (SHA) is a collection of cryptographic hashing algorithms developed by the National Security Agency (NSA). SHA-256 takes an input of data and creates a hash, which is a lengthy series of letters and numbers. This hash is then used to represent the data in a safe manner.

Sharding
Sharding is a technique for breaking down a network's nodes into smaller groups (shards) in order to improve scalability. These shards may then achieve a consensus on behalf of the whole network, eliminating the requirement for each node to execute each transaction.

Shill
The practice of extensively advertising a cryptocurrency, stock, or other asset in order to boost acceptance and, as a result, enhance its price. This is mainly accomplished via social media spamming.

Shitcoin
Shitcoin is a cryptocurrency with questionable foundations and little to no practical use.

Sidechain
A sidechain is a separate blockchain that is used to unload transactions off the main chain in order to improve scalability or add new features.

Slippage
Between the moment an order is made and the time it is filled, the price of a cryptocurrency may vary. The gap between a cryptocurrency's advertised price and the price at which a deal actually executes is referred to as slippage.

Smart Contract
On a blockchain, a smart contract is a self-executing code. Smart contracts eliminate the need for an intermediary and eliminate the need for the parties involved to trust one another.

Soft Fork
A soft fork is a blockchain upgrade that is backwards compatible. These modifications do not need the formation of a new chain, unlike a hard fork.

Solidity
Ethereum's native programming language, Solidity, is primarily used to create smart contracts.

Stablecoin
A stablecoin is a token whose value is linked to the value of another asset. Stablecoins are normally backed by a fiat currency, such as the US dollar, but they may also be backed by tangible assets such as precious metals.

Testnet
The testnet is a software environment that simulates the mainnet blockchain and is used to test network updates and smart contracts before they are deployed to the mainnet.

TLD
The final component of a domain name, or the portion that comes after the "dot" sign, is known as the TLD. (Ex: .nft, .eth, etc.)

Token
Tokens are used to represent digital and physical assets, as well as to interact with decentralised applications (dapps).

TPS
TPS stands for Transactions Per Second, which is the amount of transactions a blockchain can process per second and is used to gauge its computing capability.

Total Value Locked
Total Value Locked (TVL) is a measurement of the assets locked within a smart contract for a dapp, commonly represented in USD.

WAGMI
"We're All Gonna Make It," a popular phrase in crypto and trading circles that denotes friendship and optimism.

Wallet
The private keys of blockchain assets and accounts are stored in a wallet, which can be a software program or a hardware device. A blockchain wallet, unlike a typical wallet, does not store the currencies or tokens itself. Instead, they save the private key that certifies a digital asset's ownership.

Wallet Address
Wallet Address, also known as a public key, is an alphanumeric code that acts as a wallet's address, comparable to a bank account number.

Web1
Web1 is the earliest version of the internet, sometimes known as the "read-only web." Web1 was defined by information-based static webpages. User involvement and user-generated material were minimal.

Web2
The "read-write web," which began in the 1990s, is distinguished by user-generated content and enhanced user interfaces. As a result, blogs and social media platforms were born. Web2 put a greater focus on user experience and interoperability across various apps and websites, resulting in the large network of linked websites and services we are acquainted with today.

Web3
Web3 is the next generation of the internet, which will make use of blockchain technology, open-source apps, and data and information decentralisation. Web3 aspires to take control of the web away from monopolistic tech giants and give people back control of their data and content. The "read-write-trust web" is another name for it.

Wei
Wei is the lowest ether denomination, named after Wei Dai, a cypherpunk and cryptocurrency pioneer. 1 ether = 10^{18} gwei

51% attack
An assault in which one entity or group gets control of more than 50% of a network's nodes or mining power. This enables the organisation to cause network disruption by blocking particular transactions, double-spending crypto, and engaging in other malicious behaviour.

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