ZENO – BLOCKCHAIN BASED SUPPLY CHAIN AND LOGISTIC APPLICATION

FOR ASSET TRACKING.

Agenda

1. PROBLEM DEFINITION
2. OBJECTIVES
3. DESIGN AND METHODOLOGY
4. IMPLEMENTATION
5. UPDATES - PRESENT AND FUTURE
6. REFERENCES

PROBLEM DEFINITION

Complex, fragmented, under pressure

Products reach consumers through a chain of companies involved, which typically includes manufacturers, logistics firms – who provide storage, distribution and transport – and retailers. Not surprisingly, the whole system is highly complex.

Disrupted Market

COVID-19 resulted in significant geographical shifts in supply and demand, which in turn has created problems for finely tuned global supply chains. Trends that were apparent pre-pandemic, such as increases in online shopping and driver and other skill shortages, are now causing real problems. Second, the economic and business environment became more challenging.

OBJECTIVES

01

Supplier Management

Transparency in the bidding process thanks to a record of every transaction

02

Preventing Fraud

Fraudulent entries will be detected by an absence of hashing in the blockchain

03

Smart Contracts

Blockchain ledger verifies when a condition is met and auto-executes terms

04

Traceability

Track the movement of goods at every stage of the supply chain

05

Ledger Trust

Multiple verifications ensure suppliers and customers are on the same page

DESIGN ANALYSIS

Smart Contracts

Factory Contract pattern

Contract for executing new instances of other contract and deploy it

User Contract

Contracts based on the needs of particular user transactions

Application Contract

Smart contracts for important transactions such as ether payment processing and transaction log entry

Methodology

Gas Pricing : Off-Chain Database

Due to hyper ledger costs & Non- permissioned blockchain costs, Traditional data sets which need to be modifiable cannot be stored efficiently on blockchain.

API architecture

Express JS API architecture has been successful in interacting with ethereum blockchian smoothly, also been backbone of DAPP.

Dynamic Web Application

DAPP is able to interact with both the local Ethereum blockchain and cloud mongoDB database.

Implementation

Stage 1:

A manufacturer can update the raw materials on network. A retailer can post raw material on the product request network.

Stage 2:

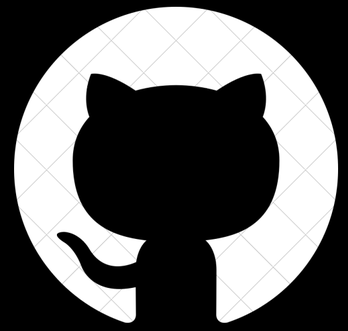
After a product request has been sent on the network. A user with proper resources can accept the request and raise a transportation request to deliver the goods.

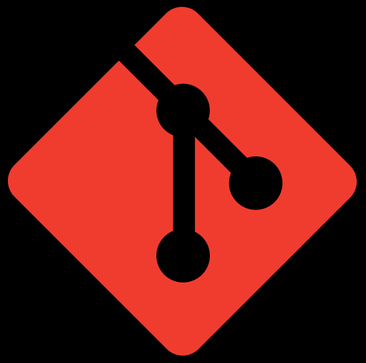
Stage 3:

Similarly, A Transporter can do the same with Transport requests. After receiving the raw materials , Requestor can confirm the fulfilment of request.

Stage Z:

Before creating a request, as of now, the requestor needs to pay the ether amount to the smart contract. After successful completion, this amount can be trnasferred.





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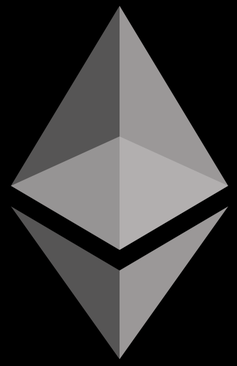

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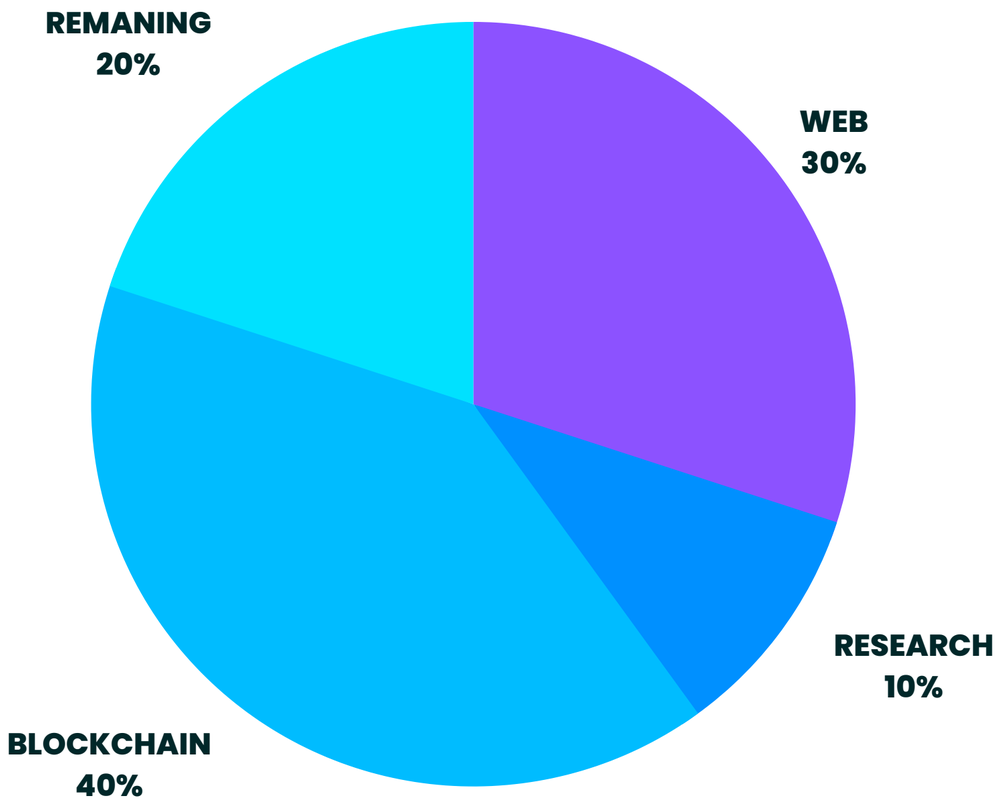
PROJECT UPDATES



CURRENT STATUS

- DAPP is able to interact with cloud database and local blockchain
- System is capable of tracking the asset during the complete supply chain.

FURTHER WORK

- Detection of Fraudulent activities on network
- Upgrading UI/UX of DAPP
- Interacting with mined blocks

IMPLEMENTATION REFERENCES

[1] https://docs.soliditylang.org/en/v0.8.13/

[2] Using blockchain to drive supply chain transparency by Stephen Laaper and Joseph Fitzgerald from Deloitte Insider (February 2022)

[3] Enabling Privacy and Traceability in Supply Chains using Blockchain and Zero-Knowledge Proofs from 2020 IEEE International Conference on Blockchain (Blockchain)

[4] https://expressjs.com/en/5x/api.html

THANK YOU!!