



Blockchain Based Decentralized System To Ensure The Transparency Of Organic Food

Prabha R¹ , M.Razmah² , Asha R.M³ , V.Subashini⁴

¹ Associate Professor, Department of ECE, Sri Sai Ram Institute Of Technology, Chennai,

² Assistant Professor, Department of ECE, Sri Sai Ram Institute Of Technology, Chennai ,

³ Associate Professor, Department of CIVIL, Sri Sai Ram Institute Of Technology, Chennai,

⁴ Assistant Professor, Department of ECE, Sri Sai Ram Institute Of Technology, Chennai ,

Abstract- Blockchain technology is revolutionizing a wide range of industries such as music-streaming service Spotify; the food industry, such as for supply-chain logistics; and healthcare, such as for storage and use of medical records. Blockchain is a method of keeping a record of a transaction. Its record is maintained through a peer-to-peer network. We introduce the concept of blockchain technology which is used to keep the details of transactions. This technology is mainly used for keeping the records of transactions. An interface for the farmers is built using Python programming language. It uses blockchain technology to store the information related to the transactions conducted.

Keywords- Accountability, block chain, credibility, reputation, traceability.

I. INTRODUCTION

The study explores the various advantages of implementing blockchain technology in the supply chain. It also provides theoretical insights on how this could reduce transaction costs. The hash of the file IPFS is stored in a smart contract, which not only improves data security, but also eliminates the problem of blockchain storage explosion. A Merkle tree is very similar to a binary tree and can summarize and quickly verify all transaction data in a block. Each leaf node uses the hash of the data block as a tag, and non-leaf nodes use the encrypted hash of the child tag as a tag. As shown in the main area of the diagram, we take the corresponding hash value of each transaction into a leaf node and combine the hash values of both leaf nodes with another hash calculation to create a parent node, i.e. the merkle root. When a transaction record changes, the values do not match. A blockchain is an encrypted distributed database in which data is recorded, i.e., a digital register of all transactions, contracts that must be independently registered. One of the key features of blockchain is that this digital ledger can be used on hundreds or thousands of computers and does not need to be stored in one place. Thanks to blockchain technology in the financial sector, participants can interact and transact directly over the Internet without any third party intervention.

II.EXISTING SYSTEM

Traditional supply chains are centralized and rely on third parties for transactions. These centralized systems lack transparency, accountability and auditability. Existing systems provide structures based on consortium chains and smart contracts to track and track work processes in agricultural supply chains, ensure traceability and interoperability of supply chains, and disrupt information islands between businesses. As far as possible, it eliminates the need for central authorities and intermediaries and improves the integrity, reliability and security of transaction records. The drawbacks of existing system are Not very effective in addressing the real problem ,High operation costs ,Not contains effective operation of internal audit, external audit, Possibility of downtime, censorship, fraud, or third-party interference

III.PROPOSED SYSTEM

In the proposed system, he can immediately receive information about the buyer's requirements. Each activity related to new product launches and product purchases is treated as a transaction and added to the blockchain with the correct unique digital signature and timestamp. Prevent users from rejecting actions they have taken. All these transactions are visible to anyone on the network. Blockchain is a peer-to-peer transaction based on a distributed node system with data encryption, timestamps, and consensus. Portals are more secure for your data because they are immutable, transparent, and accessible to everyone.

IV.BLOCK DIAGRAM

The following block diagram indicates the outline of our proposed system,

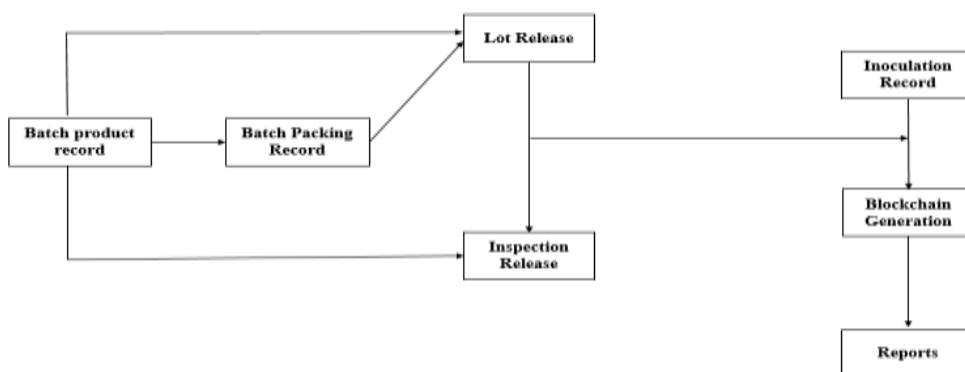


Fig 1. Block diagram

V..HARDWARE SPECIFICATION

1. Hardware Minimum Requirement
2. Disk Space 32 GB or more,10 GB or more

for foundation Edition

3. Processor 1.4 GHz 64 bit
4. Memory 512 MB
5. Display (800 x 600) Capable video adapter

VI. SOFTWARE SPECIFICATION

I. Backend Technologies

1. Python
2. Numpy
3. Sci-learn
4. Eclipse IDE
5. Jupyter notebook
6. Kernel

II. Frontend Technologies

1. Web Technologies
2. Bootstrap

VII. FLOWCHART

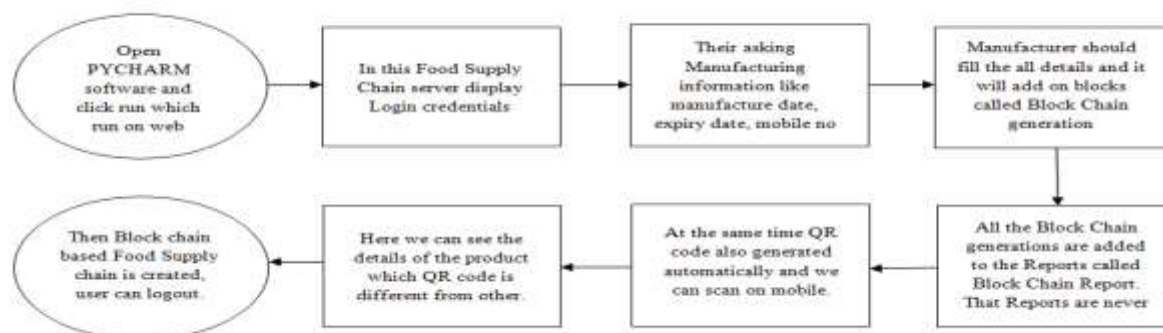


Fig.2 Flow Chart of the process

PYTHON: Python is a free, open-source programming language and it is a free, open-source programming language.

NUMPY: Numpy is the core library for scientific computing in Python. It provides a high-performance multidimensional array object, and tools for working with these arrays. Numpy is the core library for scientific computing in Python. It provides a high-performance multidimensional array object, and tools for working with these arrays.

ECLIPSE IDE: LiClipse is at the heart of all Python-based application development. It has been available for many years. LiClipse is a collection of plugins to improve Eclipse. It improves the overall Eclipse experience. It is the best IDE tool for developing Python applications.

JUPYTER NOTEBOOK: As a server-client application, the Jupyter Notebook App allows you to edit and run your notebooks via a web browser. The application can be executed on a PC without Internet access, or it can be installed on a remote server, where you can access it through the Internet.

KERNEL: The kernel is a program that executes and reviews user code content. The Jupyter Notebook application has a kernel for Python code, but also kernels for other programming languages. You can tell which ones are running and close them if necessary.

VIII. ALGORITHM

- Step 1: Open PYCHARM software and click open project.
- Step 2: Click on the food supply chain server which runs on web.
- Step 3: By entering the user id and password it will get sign in.
- Step 4: Click set up option and select the manufacture information.
- Step 5: All the details about the product will be appears in the manufacturer information screen.
- Step 6: Now enter the product information like manufacture data expiry date, address, mobile no, etc
- Step 7: Once all the details will get filled and it will added to blocks called Block Chain generation.
- Step 8: All the Block Chain generations are added to the report which called as a Block Chain Report.
- Step 9: Meanwhile the QR code will generated automatically, all the information about the product will be stored in it.
- Step 10: By using mobile phone we can scan it and get complete information about the product.

IX. WORKING

Manufacturers: Manufacturers are the first players in the food supply chain and the first to transact using smart contracts.

Processor: The processor purchases the product from the manufacturer. He is responsible for removing excess material and converting it into finished products. The processor sells this finished product to a distributor.

Distributor: Distributors are responsible for purchasing finished products from processors, managing warehouses and selling them to retailers.

Retail: A retailer buys a traceable finished product from a distributor and sells it to customers in small quantities. Traceable products represent specific item identifiers that allow tracking of origin data.

Consumer: A consumer is an end user who purchases and consumes goods from a retailer. Before purchasing a product, consumers check the seller's credibility through a reputation system.

The traceability process consists of a registration contract (RC) and an addition to a lot contract (ALC). These contracts require the address of each previous contract to maintain transaction chain traceability. For this purpose, all of these contracts are used to obtain their respective addresses. In this way, this solution helps end users achieve full traceability and maintain the source of their data. RC is used to register product entities and the products available from each entity. The product registration process includes the ALC address for adding lot details for the product. The Add Batch feature records product batches, material batches, and entries. Each ALC also has a link address to the ATC. In addition, the entities in the supply chain are registered with the network and approval is performed each time an event occurs. Only the specified entity is allowed to execute a particular transaction. For example, only an arbitrator has the authority to remove an entity or malicious user from the system. The arbitrator is an off-chain unit responsible for resolving disputes. It is the responsibility of the product owner to provide RC to ALC

The ALC contains product details and lot information. This ensures a seamless process of tracking the source of the data.

X.PROJECT MODULES

Module 1: Client Application

The client application sends the transaction to the endorser peer for execution based on the chain code. When policy specified in the chain code is satisfied the transaction is endorsed from the peer. The transaction along with the endorsement is submitted to the ordering service. The transactions are ordered by order nodes depending on the consensus. The committing peers validate the transaction and commit the transaction into the ledger. The department network is to be channelized to share the data between the departments and keep a verified single ledger in both departments. Thus, the entire department network becomes a blockchain network of the state with a single verified record of manufacturer.

Manufacture Name	Contact Person	Contact Person Mobile	Action
Manufacture 1	Contact Person Name 1	9841601998	Edit Delete
praveen	kavi	8787654321	Edit Delete
Roseline	doll	8787654321	Edit Delete
praveen	doll	8787654321	Edit Delete

[Create](#)

Figure 3. Client Application

Module 2: Blockchain Generation

In our design, each block mainly consists of various types of transaction. These transactions are made up of five data fields, including a time stamp, the sender, the recipient, the amount, and data records content. smart contracts are designed in the blockchain based on the Ethereum technology. Ethereum is a decentralized and open source application software platform based on blockchain technology, which allows users to build and use decentralized applications with blockchains. In this way, the information about famrer products is broadcast through the whole supply chain as a reminder to the corresponding institutions, and the inoculation institution is not rewarded for forcibly injecting various products.

Blockchain Generation

No of Blocks Are Created

3

No of Blocks Yet to be Created

0

[Generate Blocks](#) [Cancel](#)

Figure 4. Blockchain Generation

Module 3: Blockchain Processing

This immutable nature of blockchain technology will fortify farmers to get a legitimate price of crop and reduce the cost of operation for selling and buying crops when compared to traditional methods. When an intermediary's support is required, then it will take a couple of months to

confirm and verify the farmer's data while issuing any subsidies for farmers. In a blockchain, the current data is verified data so that intermediaries can be avoided. The security of data against unauthorized modification is to be ensured. Personnel data of farmers including bank details and other sensitive information are collected. In the blockchain-based system, cryptographic hashing makes the data in blockchain tamper-proof and irreversible. The data is shared in a distributed manner helps to prevent the unauthorized modification of data via consensus mechanisms in the blockchain.

Food Name	Usage	Expiry Date	Action
Apple	To Eat	2020-10-10 00:00:00	Edit Delete
Orange 1	U2	2022-01-01 00:00:00	Edit Delete
grapes	fruit	2021-04-21 00:00:00	Edit Delete
LAYS	chips	2021-04-23 00:00:00	Edit Delete

Figure 5. Blockchain Processing

XI.SUSTAINABLE DEVELOPMENT GOALS

A Blockchain based decentralized system to ensure the transparency of organic food satisfies the SD goals as goal number 3) Good health and well-being – since it shows the expiry date of the product and ensure the safety of the consumer, So it satisfies the goal number 3.

XII.RESULT

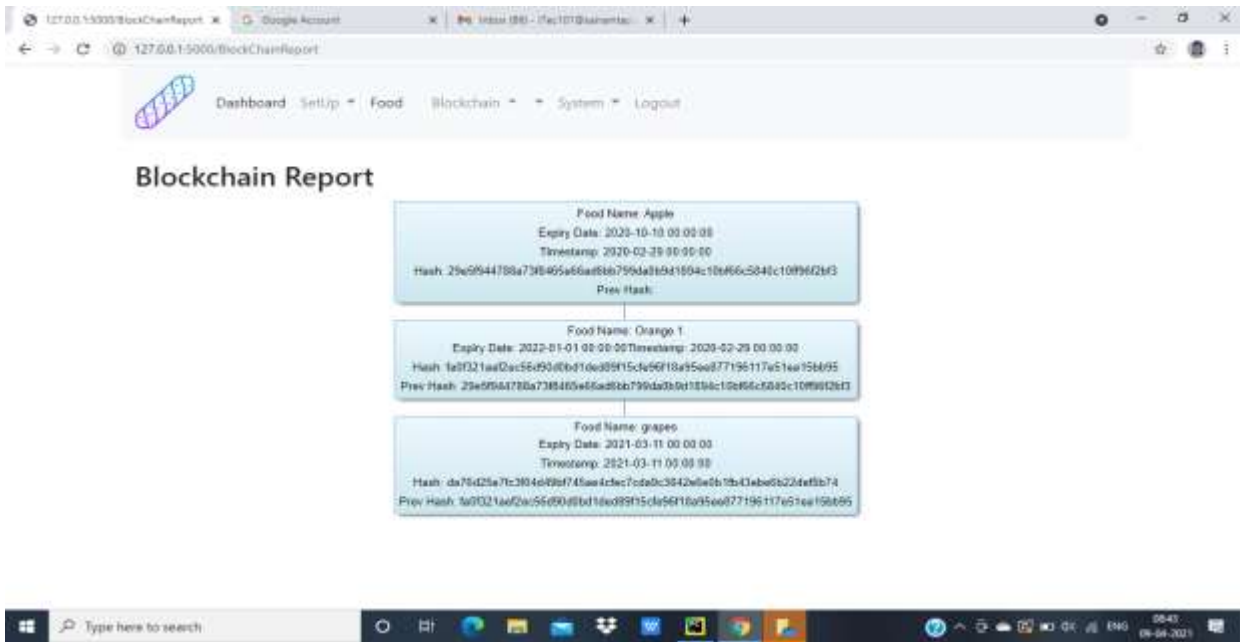


Fig 6. Result of BlockChain Report

In public blockchain, every member can get toward the information base, save a duplicate also adjust this through building accessible its processing power. Bitcoin, for instance, has a public blockchain. However, a private blockchain is the place a focal expert deals with the previliges toward get to otherwise adjust the information base. The framework is effortlessly consolidated inside data frameworks as well as provides the additional advantage of an encoded review path. Within private blockchains, the network does not have any compelling reason towards urge diggers for utilizing its processing capacity for executing the approval algorithm. For instance, Credit MutuelArkea picked a private blockchain towards sharing their client information amongst the gathering's various substancdes. In public blockchain people can see the details on website, but in our project we use private blockchain by this details of the product will be displayed on mobile apps (i.e.) QR code. Above figure shows the blockchain report of the web output.



Figure 7 QR Scanning

QR code generation model to validate products were developed. QR codes were used as the link layer between digital and physical world. QR codes can be smaller. A QR code can be up to 10 times smaller than a bar code and still readable. So you can print smaller labels that carry more information. QR codes are easier to read - to read a barcode you have to aim the scanner in line with the code, while a QR code can be read from any angle.

COMPARATIVE ANALYSIS

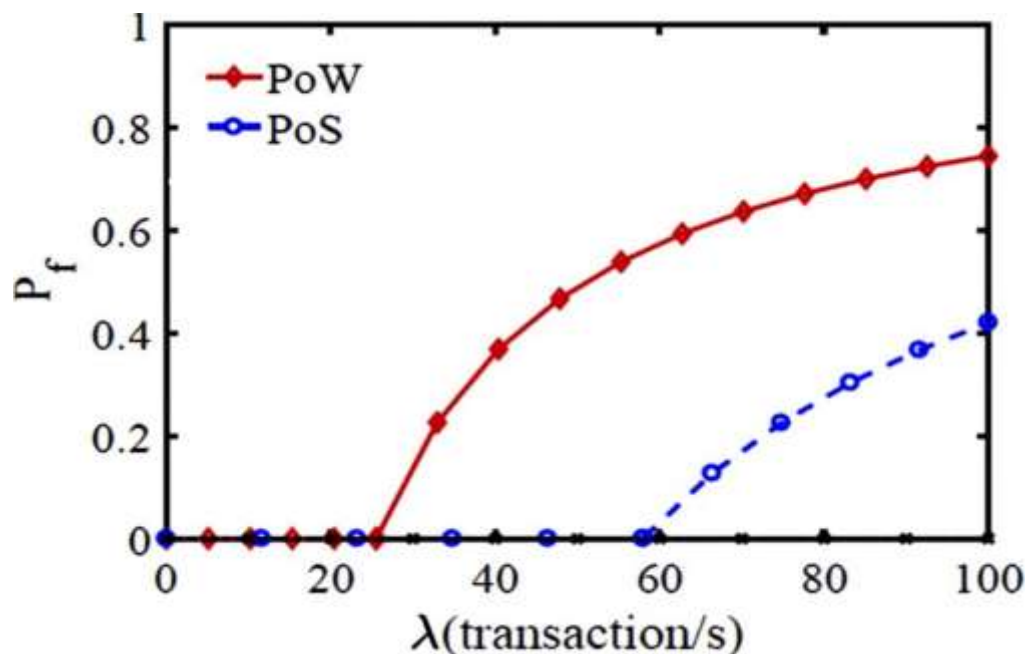


Fig:8 TPS

The above figure i.e Transaction Per Second in Pow and PoS increase linearly first, since they have achieved the limitation of blockchain. In contrast, the TPS is always increases with the arrival rate without limitation. The result is consistent with the conclusion claimed in that blockchain uses the new transaction to perform consensus and its TPS has no technical upper bound as long as the new transaction arrives soon.

Application

Secure sharing of medical data, Real time IoT operating systems, Personal identity security, Voting mechanism, Original content creation.

XIII. CONCLUSION

There is evidence that there are benefits to joining the supply chain. Much research and implementation has been done on supply chains and blockchains, but how blockchains can improve their participation in the supply chain has not been investigated. Therefore, this paper analyzes how blockchain supports and reduces transaction costs and improves supply chain participation.

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