

Food Supply Chain Management Using Blockchain in Food Traceability

D.Lekha^{1,*}, S.Chakaravarthi², P.Visu³

¹P.G Student, Department of CSE, Velammal Engineering College, Surapet, Chennai, lekha.doss9327@gmail.com

²Professor & Head, Department of CSE, Velammal Engineering College, Surapet, Chennai, chakra2603@gmail.com

³Professor, Department of CSE, Velammal Engineering College, Surapet, Chennai, pandu.visu@gmail.com

Abstract

The objective of the project is to avoid the food adulteration in public society. People want awareness on food chain management. The blockchain is used to trace the food items can be identified by the packet backside is packing date, expiry date, packing place, ingredients are added etc like that each and every things can identified. A detailed network security of blockchain analysis is performance of the investigation to capture the vulnerability of tamper proof of the digital database in proposed architecture under different types of attacks called hackers. The organisation as decided that to create the food safety on the public society. The company will collect the product from farmer then the manufacturer will produce the product then the distributor will buy the product from manufacturer. The consumer will buy the product from distributor through the online transaction with the help of blockchain. Scanning the QR code will get the details of the food product. Nowadays people are suffering from the food borne illness. To avoid the food borne illness we are tracing the food in many items starting from the farmer to the consumer. To trace the food items are updating in the blockchain.

Keywords: Food Supply chain, Block chain, Food Traceability, Database, Mobile phone.

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1. Introduction

Food is a vital role in our life. Many of us are working hard for the food in day today life. For avoid the food adulteration to create the transparent food supply chain management using the blockchain concept. To trace the food starting from the farmer producing the product till the consumer will collect product in between the transaction the product. All aspect of food product is cultivating from one place and is exporting from one place of local station to another place remote station. From exporting it is then shifted to local station to Manufacturer Company. While tracing the food we can see product details like packing date, expiry date, and ingredients are added, flavor added, sugar added checking the product through the online transaction. When the mobile is start for scanning the product will display in the

screen. To transfer the food details in the blockchain should be very confidential in the network transaction. By collecting the food details will updated in the blockchain system. where the possibility to improve the interactions between human and machines may generate unprecedented technical and economical opportunities.



Fig. 1. Food Supply Chain Management

fig:1. Gathering information about environments and processes will increase the capabilities to control complex systems and to predict events, thus optimizing the production, the security, and the overall efficiency of the food system.

2. Existing Work

In existing system, the food packages does not contains the proper details like food ingredients, packers details, package date and expiry date etc.. So, the end user or customer does not have any awareness of that product details. That product have product id and shop information only. Real-time food products are monitoring the food quality and visibility of that quality check index will prevent the outbreak of the food-borne diseases, economically the healthy way of producing and motivated food adulteration, food contamination, food wastage due to the total misconception of the labeled expiry dates, and losses due to spoilage, which have created the broad impacts on the whole food products security.

3. Proposed Work

Producing the food products are well sophisticated in the surrounding. In behalf of the RFID to improve the complete healthy and safety food product to prevent the wastage, kit based technologies are required to monitor the food product quality and increase the visibility of food product level to be in monitored data. Sensing techniques are high level compatibility in the food product with existing tracking system and tracing system infrastructure are currently proposed for monitoring healthy food products. These sensors can be invasive or non-invasive in monitoring the physical or chemical properties of food such as pH, conductivity, and permittivity or the

packaging environment such as temperature, humidity, moisture or aroma. In general, these sensors are aimed to prevent defective products from reaching the consumers. We should add the all details in blockchain. All details like food product buying place and date, product ingredients, buying date, expiry date, product packaging date etc. Blockchain technology was proposed recently to improve the quality level of traceability in the food product. And most important we should use QR code Scanner wireless sensor for scan the product and create sensorID. Each food product with an barcode travels through many stages of transactions at different terminals starting from packaging through transportation, storage and finally to a consumer for purchasing the product. A datadase in blockchain is updated the information about the food package at each and every valid network transaction. Once the transaction is verified, the transaction of the sensorID is converted into a block of information and appended to its pre-existing data blocks thus forming a chain of information blocks and thus a blockchain.

4.Overview Of The Description

In tracing starting from the supplier for each product it contains the barcode number and its number will be passing through food API then ingredients will be taken out by using barcode number. First registration. The registration form contains supplier details. Then login. Supplier sells the products to all manufactures what they produce. The manufacturer initially creates the account. They will analyze the raw food product with the kilograms and the manufacturer will request the quantity of raw food product to the supplier. The manufacture will send the food product details like in the packet backside that is product ID, expiry date, number of packets, etc to the block chain and then the ready product will be added to manufacturer shipment cart to trace the packet[1]. From the block chain the supplier and manufacturer will get the product details. Then the Distributor First registration. The registration part contains distributor details. And login. The distributor will search the product in the manufacturer shipment cart and then buying product with the help of request and response the distributor will be added to the block chain. At last the Consumer First Registration. The registration form contains user details. In addition to the food supply chain management produce the details in the block chain. It based technologies are required to monitor the food quality and increase the visibility level of the monitored data fig:2. Its number will be passing through food API then ingredients will be taken out by using barcode number. Block chain technology was proposed to improve the traceability of a food product. By connecting through the network topologies. To monitoring the food product from the supplier to the customer keep on checking the product to observe the quick transaction of the food supply chain product.

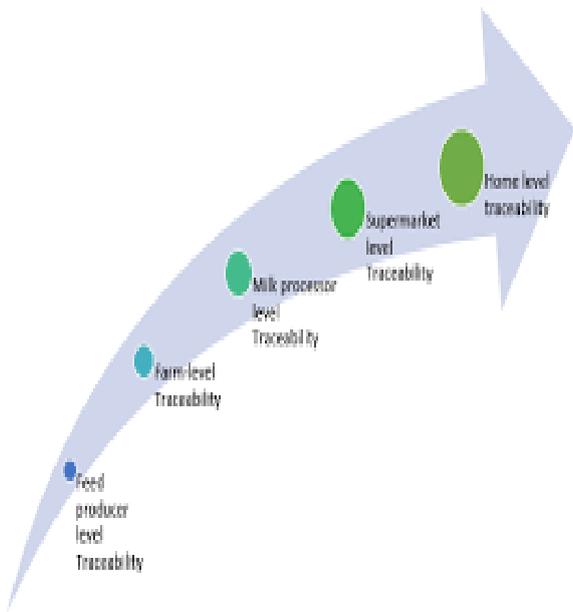


Fig. 2. Tracing the Food Level

The consumer scan the barcode with the help of mobile camera and then view the product in the mobile such as manufacturing date, packing date etc [2] and [3]. The consumer will check the product and they will buy the product by using online transaction.

4.1 Concept Of Blockchain

Blockchain is concept of ledger. It has only to view the blockchain the hackers will not overwrite in the blockchain. The part of the product is to run in the blockchain only with the help of java intendedfig:3. To open the blockchain first it will run at the back side of the blockchain home page then tomcat software will open it at the another side of the page. In that the tomcat as manager apps in that open the food supply chain management. If we type the wrong url the blockchain will not open and update. Blockchain technology was proposed to improve the traceability of a food product. These sensors can be invasive or non-invasive in monitoring the physical or chemical properties of food such as pH level, temperature, water level, conductivity, and permittivity or the packaging environment such as temperature, humidity, moisture or aroma in encrypt format.

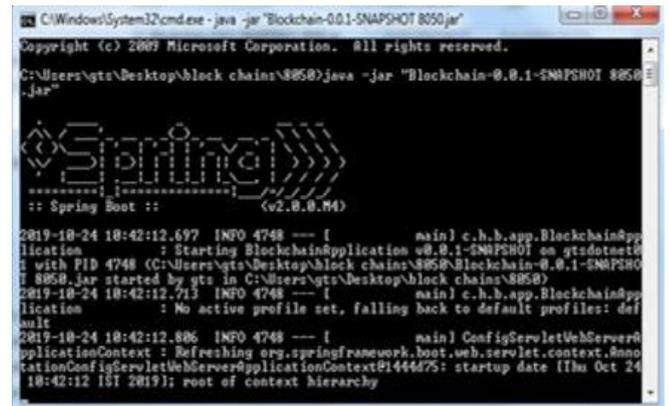


Fig. 3. Blockchain jar file

The blockchain home page is open in that there will be many option. First one is admin and then sign up and then login like that these option will display on the top right corner of the home page.

4.2 Admin Account

First admin as login the page with help of username and password. The username is admin and the password is also admin to open the admin account. In that admin will have some product to prepare like lays, oreo biscuit, noodles, etc like that many product will display in the screen fig:4. Only the foreign product will capable or prepare the products in blockchain. Indians products like shakthi masala, achi masala these kinds of products are not allowed because the blockchain is not invented in india. By seeing this admin block what are the products are asked to prepare the supply and manufacturer will ready to prepare the products[4]. In database what are the products for lays needed, what are the products for oreo biscuit needed like that many product are updated in the database. Not only one farmer many farmer like potato farmer, salt farmer, vegetable oil farmer, chilli powder, etc like that many ingredients are needed for the lays product. These product will add the what are the product needed it will shown below by this supplier will start cultivating the raw materials. These raw materials will update in the blockchain by seeing this manufacturer company will collect the raw materials from them to prepare the food product [5]. This admin will only ask to do the product food product in the online shoppers and online customers buyers in the network system.

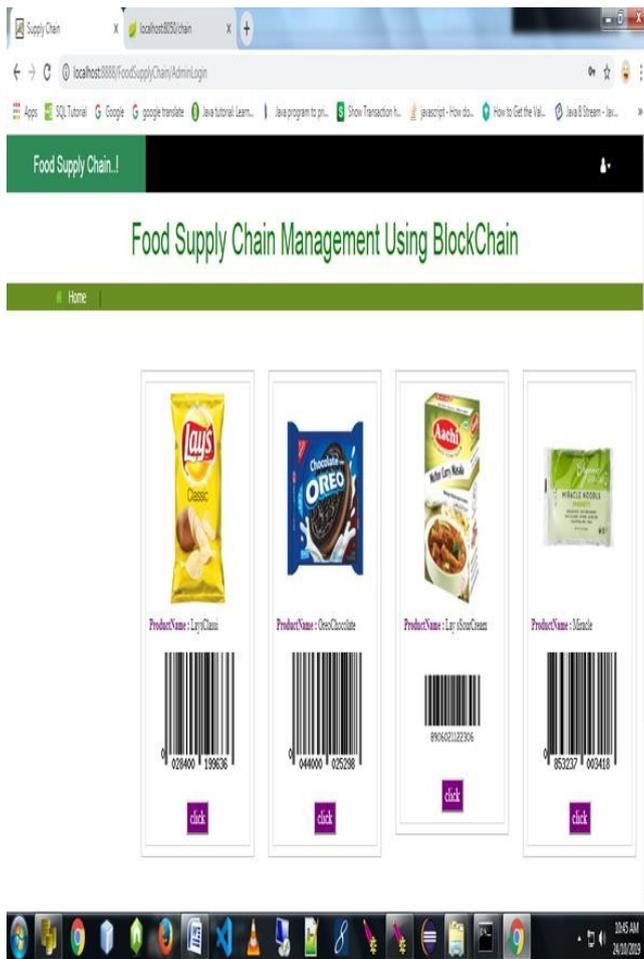


Fig. 4. Admin page

By default all the suppliers should follow the blockchain concept and they supplying the product. Where ever you buy the product need the product details to update that product in each and every time in everywhere places.

5. Registration For The Supplier Account

In registration process first the username, email id, place, phone number, what product that you are having, how many kilograms that you have, what is price of the quantity, picture of the product like this details will be registered in the supplier account. Once complete the registration process like already registered it will open a page called supplier login page. In that username and password have to mentioned then click login. Supplier page will open it will have a all product, add product, request product. In all product you have to update the product what you have, how many kilograms you have , what is the price of the product, it will shown in the display. In add product if you have another product like chilly powder, vegetable oil, etc fig:5 like that also will update in the add product content. At last the request

product is if manufacturer will give the request to supplier it will shown in the request product page. Supplier will update all the details in the blockchain [6] and [7] .

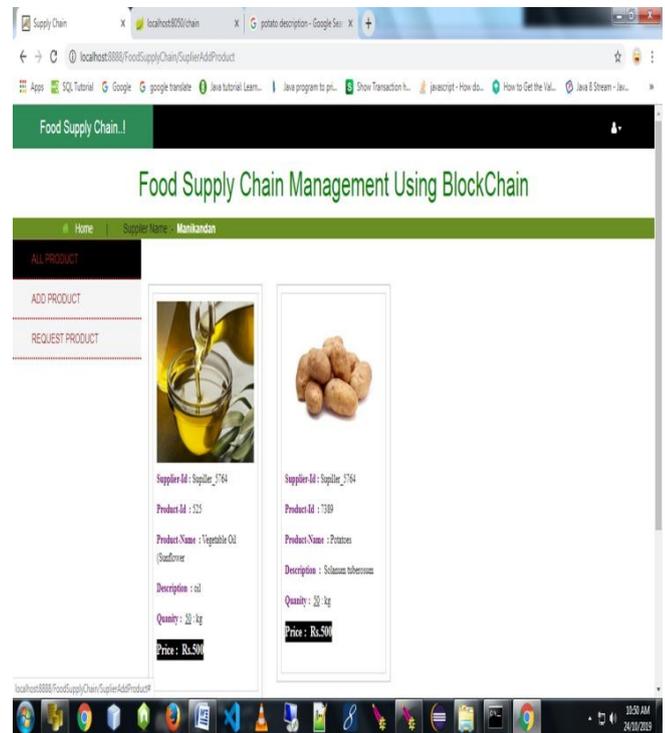


Fig. 5. Supplier login page

Supplier will have the request/response button while clicking the button it will display how much of quantity is available in the supplier store. With the amount of quantity the product rate will be increased. The supplier will add the products in the admin list by seeing this page manufacturer will give the request and later the supplier will accept the request then the transaction o products will exchanged with the accurate rate in the market. It will display on the screen in encryption format.

6. Registration For The Manauacter Account

The manufacturer initially creates the account. They will analyse the raw materials and the manufacturer will request the quantity of raw materials to the supplier. Then suppliers will accept the request from manufacturer and raw material will be added to the manufacturer inventory. It will have the username, password, email id, phone number and register the account. Then click the already register then you will find the login page.Fig:6 Open the page and give request and again open the supplier account in that accept the manufacturer request and complete the process.



Fig. 6. Supplier request/response page

The manufacture will send the product ID, expiry date, number of packets, etc to the block chain and then the created product will be added to manufacturer shipment. From the block chain the manufacturer will get the product details of starting to end. Fig:7 Manufacturer will update all the details in the blockchain with the encryption format[8]. For that no one will understand the transaction between the blockchain and manufacturer.



Fig. 7. Manufacturer product Tracking page

While tracking the manufacture details will come to know that the product is good or not in the society.

7. Registration For The Distributor Account

First select the account as distributor account. Then register the account username, phone number, email id, place then register the account. Distributor will purchase the product in the manufacturer list what are the items are needed like that those items are purchased fig:8.

LOGIN PAGE

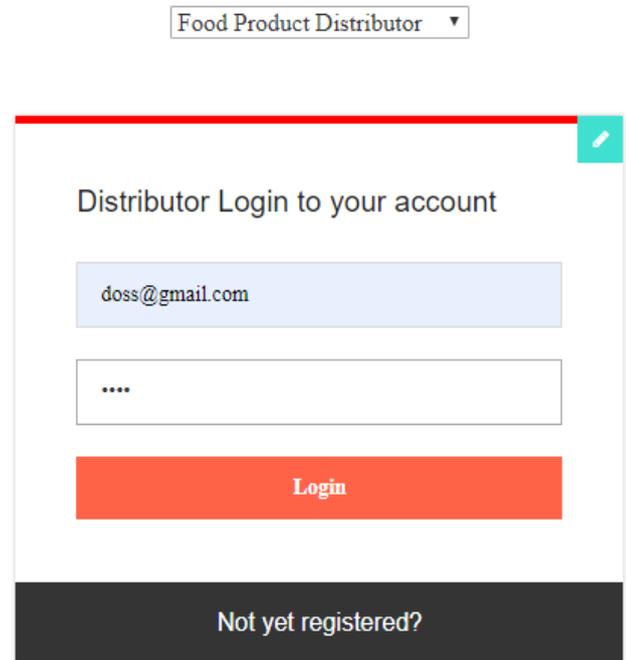


Fig. 8. Distributor login page

For each items has unique code and price for the item. The price will be higher than the manufacturer price. Before that select the manufacturer name automatically it will generate the product id and place of the manufacturer. hen the shipment will trace the product starting from the farmer to manufacturer and distributor will update all details in the blockchain. If we not registered can't able to buy the product from manufacturer fig:9. With the help of request and response only the transaction will done on the bases. The network security are needed in the transaction to obtained the products in the market rate of the current manufacturing system. The distributor want to sell the product in the market rate. The customer will check the product in the market rate, places of the manufacturer, place of the supplier cultivating the raw materials in the market rate of the online transaction. While buying the product will scan the qr code will automatically will display the product details in the screen.

Distributor Requests

Fig. 9. Distibutor request page

8. Registration For The Consumer

First select the category to register the process of login. Then select the grocery items to click the product what you want. The distributor will have the product in the grocery list. The consumer choose the grocery items what he needs put in the cart and he will scan the product QR code through the mobile devices automaticall it will generate the product details starting from the farmer till the consumer. To check the method of tracing in each and every step in the process [11] and [12]. For example admin needs a lays packet below that lays packet what are the ingredients ae needed it will mentioned below by seeing this farmer will cultivate the potato, chilly powder, salt, vegetable oil, etc like that many farmer will start cultivate the ingredients and farmer will update in the blockchain. With the Manufacturer will give the request to the farmer and farmer will accept the request to collect the potato in a rate and start preparing the lays product [9] and [10]. Mentioning the expiry dates, packing date, rate of the single packet, what are the ingredients are added like that inormation it will added. By seeing this distributor will buy the product before buying he will give the request the manuaacter will accept the request and then purchase the product from the manufacturer to put in the cart then update in the blockchain. By seeing this conumer will buy the product with the help of blockchain then the payment mode is started. It will ask that credit card pament or debit card payment or cash payment or net

banking payment like these kinds of payment is available. Through the types of payment can pay the amount transaction on the delivery date.

9. Request And Response Transaction

By defaultly all the mobile computing devices are in communication through the personal networks. The Database Management system are in the request and response transaction in client the the exclusive periodic process are well managed in the structure query language database in Mysql language. The total cost of the devices are very high or low in nature of hardware and software in the applicatn software system. It has security key usage while transmitting the data information from request to the server system fig:10. The personal computer will have the normal configuration to use the process in the block chain step by step [13]. This cloud process will have tree structures to have the share market invest in bit coins. It is created like node using this node only block chain will create and update. The storage of data in system characteristics in mainframe of network system computing and the client server data are stored in request response connectivity of the storage[14]. It has the request server software application in that many process can stored the data information [15]. In this the mobile devices are used in the form of hardware based technology and moreover the complexity of hardware is mainframe computers.

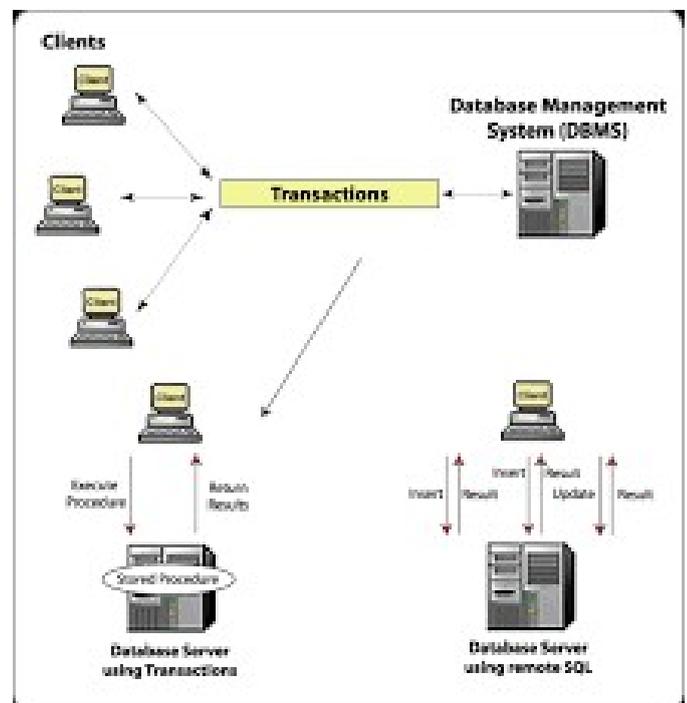


Fig. 10. Request/Response transaction

The pronix in the data base has the product is noodels, lays, oreo biscuit has the American product only will update in blockchain not has like achi masala, shakthi

masala are indian product will not update in the blockchain. This client and server transaction will be high secure in the network system.

9.1 Network Bank Transaction

While tracking the food product from supplier store to the distributor store with the help of barcode in the product. It has created the account. Only the bank account customers will buy the product through online. The customers username, address, phone number, passport size photo, account number etc like that many details will ask to enter on the account. Then payment is going to happen like credit card or debit card like that it will ask click on the payment to access the card details in the payment mode. Then click the payment it will receive the amount transaction successfully in the food supply chain management system. Through our mobile phone can able to see the product details from the blockchain. Through the online transaction we can buy the product from the home itself no need to go outside to buy the product.

9.2 System Network Computing

The software and hardware system in computing the network transaction is widely comparable to the operating system. The software system in that operating system is major play in:

- JDK 1.7
- J2EE
- Tomcat 7.0
- MySQL

It will send the client/server of the request and response transaction through the client server computing of networked monitoring system in the advantages of low (or) high level of personal signals in the computers. It plays the role of Linux, Unix windows and application in server database. Microsoft windows are another operating system in the mobile devices. The hardware system in that operating system is major play in:

- Hard Disk : 80GB and Above
- RAM : 4GB and Above
- Processor : P IV and Above

Through the sense of internet computing the personal computers and mobile devices are highly farmable.

Appendix A. Texture Of The Features

From the above mention scenario many cases of food traceability in the system development are proposed very

high performance through the internet computing by the usage of software development. It has network security keys features of technology used in: J2EE (JSP, Servlets), JavaScript, HTML, CSS, AJAX.

- Hibernate Framework
- MVC Pattern

Through the transaction of the food product cost and food packing date and food product expiry date, food ingredients, etc. Through the blockchain all information are shared in it. Blockchain are shared the networks space to the biometrics. This blockchain will updated in the encryption format that nobody can able to understand the transaction is done between the product buyers and sellers.

Appendix B. System Organization Of The Food Network

The storage of the food data in system characteristics are occurring the mainframe computer of network system computing and the client, server data transaction are stored in the request and response connectivity of the network storage. It has the request server software application in that many process can stored the data information and the response server will also produce the software application. The total cost of the devices are very high or moderate or low in nature of the hardware and software in the application software system. It has the security key usage while transmitting the data information from request to the response server or client system. The network is fully manual in somewhere and automatically in transaction places.

9. Conclusion

Food is the major part of the system in the world. It survives many modern technology cameras, GPS, RFID tool kit. Next generation has to follow the standardized tasks of the healthy food trend appear in the smart cities. To keep tracking the food items many of them will buy the product by seeing the ingredients and expiry date of the product, packing date of the product with the help of the blockchain technology. Mobile technology has disabling scanning devices of the food product details should display in the screen. The rising cost of hospitalization is decreases the elder and younger population in the food borne illness and the food adulteration through the better lifestyle environment will be designed. The monitoring platform exploits the combined processing of the product. This will allow to all over the world because every year people are suffering from the food borne ill diseases to avoid that many government organization must take action to avoid the food borne ill diseases. The architecture enables a flexible and easily reconfigurable monitoring of a complex space as well as it permits to capture the user's interaction with specific nearby products.

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