# Food Safety Transparency and Traceability System Based on Ml Enabled Blockchain Technology

**Mrs.Geetha T[1], Abirami P[2], Anisha S[3], Dhivya T[4], Kaniyashika B[5]**
[1]Prof., Dept of Computer Science
[1, 2, 3, 4, 5] Dhanalakshmi Srinivasan Enginaeering College,Perambalur, Anna University,India

***Abstract-*** *Blockchain could be a distributed ledger technology wherever transactions area unit recorded and hold on creating them tamper resistant that is made around robust cryptanalytic technology. Recent studies specialize in the key principle of Blockchain wherever it is often applied to areas like information security exchange, food's safety, to reinforce productivity and in fast business across retail retailers. The idea has original in build safety features to prevent the substandard and counterfeiting of medication. Even at the amount of individual stock keeping, the Blockchain can make sure the pursuit of offer chain of any product developing an indication of possession victimization specific sources. The idea permits transparency altogether styles of transactions as whenever a product changes hands the transactions are often documented and verified victimization distinctive ID, from its manufacture to sale and this may be justly same that blockchain is changeless, provides agreement and origin. Once a block is completed, it creates a novel secure code, that ties into subsequent page or block making a sequence of blocks.Since the construct relies on robust scientific discipline hash technique thus transactions created can't be duplicated or encrypted, the copies square measure identical and specific permission is needed to access the information. This is able to drastically cut back human error, superimposed prices, and time delays and will become a universal offer chain package. The projected theme tracks the assembly of foods from makers to distributors that later sell them to customers supported K-Nearest Neighbor rule. Invalid product are typically came back once approval by specialized entities and so decentralized and conjointly offer the notification regarding validity of the merchandise.*

***Keywords***- Distributed ledger technology, Cryptographic hash technique, Data Security exchange, Encrypted, Unique Secure Code, K-Nearest Neighbor

## I. INTRODUCTION

Web mining is that the application of information mining techniques to find patterns from the globe Wide net.It uses automatic strategies to extract each structured and unstructured information from web content, server logs and link structures. There are 3 main sub-categories of net mining. Web page mining extracts info from inside a page.Net structure mining discovers the structure of the hyperlinks between documents, categorizing sets of web content and mensuration the similarity and relationship between completely different sites. Net usage mining finds patterns of usage of web content. The growing trend of merchandising personal information as an artifact encourages website homeowners to trade personal information obtained from their site. This trend has redoubled the number of information being captured and listed increasing the likelihood of one's privacy being invaded. Corporations the businesses that obtain the info a duty-bound creation it anonymous and these companies are thought-about authors of any specific unharness of mining patterns. They're de jure chargeable for the contents of to unharness; any inaccuracies within the release can lead to serious lawsuits, however there's no law preventing them from commercialism the info. Some mining algorithms would possibly use contentious attributes like sex, race, religion, or sexual orientation to categorize people. These practices can be against the anti-discrimination legislation. The applications create it arduous to spot the utilization of such contentious attributes, and there's no sturdy rule against the usage of such algorithms with such attributes. This method may lead to denial of service or a privilege to a personal supported his race, faith or sexual orientation. This case are often avoided by the high moral standards maintained by the info company. The collected information is being created anonymous in order that, the obtained information and therefore the obtained patterns can't be derived back to a personal. It would look as if this poses no threat one's privacy, but further info are frequently inferred by the applying by combining 2 separate unscrupulous information from the user. A 'web search engine' may be a package that's designed to look for info on the globe Wide net. The search results as typically given inan exceeding line of results typically cited as program results pages (SERPs). The data could also be a mixture of web content, images, and different sorts of files. Some search engines additionally mine information offered in databases or open directories. In contrast to net directories, that are maintained solely by human editors, search engines conjointly maintain period data by running Associate in Nursing algorithmic rule on an online crawler. an exploration engine maintains the subsequent processes in close to:

1. Net crawler
2. Indexing
3. Searching.

## II.DENTIFY, RESEARCH AND COLLECTIDEA

**Existing System:**

In recent years, food safety issues became progressively serious. The traditional supply chain traceability resolution faces some serious issues, like centralization, information meddling, and high communication prices. Though food traceability has been valued by all walks of life, food traceability technology still faces several difficulties. In an exceedingly distributed traceability system, every node maintains completely different databases and lacks a unified commonplace, that the price of every node and therefore the communication price between nodes square measure terribly high. Additionally, distributed systems square measure troublesome to satisfy the performance and useful needs of food traceability. For instance, the question speed is just too slow, and no advanced search perform is provided. Therefore, the centralized food traceability system is a lot of usually used at this time. However, a centralized system requires the trust of assorted participants within the market, which is troublesome to realize in an exceeding economy. Once the information within the central organization is against a celebration, the recorded data is probably going to be maliciously tampered with. And therefore the central organization is at risk of one purpose attack. Additionally, ancient food traceability schemes square measure troublesome to confirm client privacy. The administrator of the traceability system will question the consumer's personal data. Shoppers will decision the strateg of querying traceability data within the chain code to quickly acquire the whole offer chain data of the merchandise. The chain codes additionally management the question authority of every organization, effectively protective the user's non-public data.

**Disadvantage:**

1. This central authority tracks the product journey, it suffers from an aggressor.
2. Square measure security and privacy considerations concerning centralized systems as they're continuously at risk.
3. Retailers might modification the end details of the product

**Proposed System:**

We reside in an exceedingly digital era and therefore the technology of this digital world is dynamical chop-chop. The attention-grabbing a part of this digital revolution is that it directly or indirectly impacts every people. whether there's an amendment within the smartphone technology resulting in a revolution within the flow of data, or advancement in on-line security so dynamical the manner we have a tendency to do organic phenomenon.In recent times food safety has drawn upsurge of educational and industrial considerations. In provide chain space, with the rapid climb of web technologies, tons of rising technologies are applied in traceability systems. However, to date, nearly all of those systems' area unit centralized that area unit noncompetitive, uneven and opaque that might lead to the trust downside, like fraud, corruption, change of state and disproof data. Besides, centralized system is at risk of collapse, since one purpose of breakdown can lead the complete system to be crashed. This includes the secure handling and storing of body records and digital authentication to strengthen material possession rights and patent systems, also as bring transparency throughout the provision chain, scale back food frauds and enhance the food safety. Blockchain has established its alone authority within the monetary sector and currently the food business is watching wherever it maybe applied. We should always conjointly confine mind that this technology is at its emerging stage, and it's going to take a lot of analysis and time before it becomes elements and parcel of the food business. And conjointly implement machine learning algorithmic rule named asK-Nearest Neighbor algorithmic rule to look the distributors supported manufacture most well-liked locations. KNN algorithmic rule at the coaching section simply stores the information set and once it gets new data, then it classifies that information into a class that's a lot of kind of like the new information.

**Advantage:**

1. Elimination of error handling through period of time following of food production and reselling with no double disbursement.
2. It decreases the success rate of attackers.
3. It provides security, transparency and potency.
4. Avoid the merchandise that area unit invalid and correct notification
5. Economical notification system.

## III. WRITE DOWN YOUR STUDIES AND FINDINGS

**Implementation:**

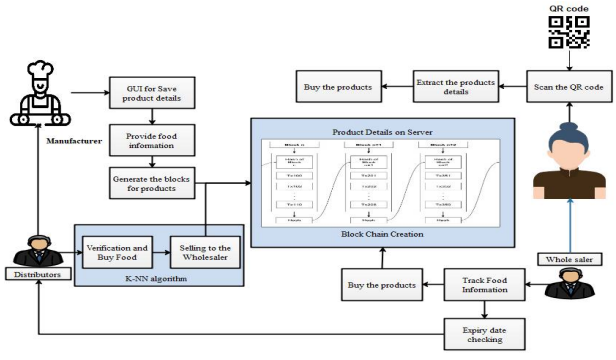
There are five modules implemented in our system

- Food Supply chain creation
- Load food information
- Block chain based encryption
- Distributors selection
- Product retails

**FOOD SUPPLY CHAIN CREATION**

The food business may be an advanced, international network of various businesses that provides most of the food consumed by the world's population. The term food industries cover a series of business activities directed at the assembly, distribution, processing, conversion, preparation, preservation, transport, certification and packaging of food stuffs.The food business these days has become extremely heterogeneous, with producing starting from tiny, ancient, family-run activities that are extremely effortful, to large, capital-intensive and extremely mechanized industrial processes. Several food industries rely virtually entirely on native agriculture, produce, or fishing. Framework construction was handled by admin.

Admin produce framework that helps for food trailing method. Admin has distinctive username and parole. Admin has the responsibility to keep up the all the main points. During this module admin will read user details and food info. During this module, we will offer login for Manufacture, Distributors, Suppliers and Users. Software design involves the high level structure of software abstraction, by victimisation decomposition and composition, with style of architecture and quality attributes.




A software system design style should adapt to the key practicality and performance needs of the system, furthermore as satisfy the non-functional needs like responsibility, measurability, movableness, and handiness. software system design should describe its cluster of elements, their connections, interactions among them and readying configuration of all elements.

**Processing:**

.Net Framework :

.NET Framework (pronounced dot net) may be a software system framework developed by Microsoft that runs totally on Microsoft Windows. It includes an oversized library and provides language ability (each language will use code written in alternative languages) across many programming languages. Programs written for the .NET Framework execute in a very software system surroundings (as contrasted to hardware environment), referred to as the Common Language Runtime (CLR), Associate in Nursing application virtual machine that gives services like security, memory management, and exception handling. the category library and therefore the CLR along represent the .NET Framework.The.NET Framework's Base category Library provides interface, knowledge access, info property, cryptography, net application development, numeric algorithms, and network communications. Programmers manufacture software system by combining their own supply code with the .NET Framework and alternative libraries. The .NET Framework is meant to be employed by most new applications created for the Windows platform. Microsoft conjointly produces Associate in Nursing integrated development surroundings for the most part for .NET software system referred to as Visual Studio.

**SQL SERVER:**

Microsoft SQL Server may be a electronic database management system developed by Microsoft. As a info server, it's a merchandise with the first operate of storing and retrieving knowledge as requested by alternative software system applications—which might run either on the same pc or on another pc across a network (including the Internet).Microsoft markets a minimum of a dozen totally different editions of Microsoft SQL Server, geared toward totally different audiences and for workloads starting from little single-machine applications to massive Internet-facing applications with several cooccurring users. knowledge storage may be a info, that may be a assortment of tables with type written columns.

SQL Server supports totally different knowledge sorts, as well as primary sorts like number, Float, Decimal, Char (including character strings), Varchar (variable length character strings), binary (for unstructured blobs of data), Text (for matter data) among others. The misestimation of floats to

integers uses either bilaterally symmetric Arithmetic misestimation or bilaterally symmetric round (fix) looking on arguments: choose

Round(2.5, 0) gives 3.

**Performance Testing**:

The performance of the system analyzed by security of the system and it had been enforced with success.

**GOALS**:

1. Provide users a ready-to-use, communicative visual modeling Language so as that they'll develop and exchange important models.
2. Provide extendibility and specialization mechanisms to extend the core concepts.
3. Be freelance of express programming languages and development technique.
4. Provides a correct basis for understanding the modeling language

## IV. CONCLUSION & FUTURE ENHANCEMENT

**CONCLUSION:**

In recent years, food questions of safety became a lot serious and keep threatening the public health. It's vital to trace and trace the elaborated event data among the total food offer chain together with food production, processing, reposition, transportation, and retail. Establishing an correct and effective food safety traceability system has become a key resolution to the food questions of safety. Gift a blockchain based resolution to trace the validity of food victimization food question, re-consumable food from its producing till they're re-sold to customers. This method involves interaction from many various members that area unit all ruled by the good contracts. Retailers might make sure the responsiveness of food data with the assistance of Blockchain primarily based knowledge storage

This method helps for pursuit foods and confirmation their condition generally needs a centralized server to trace every food because it is transferred between totally different stakeholders. For food that encompasses a specific expiration date, data clipping perform will be established to cut back the number of knowledge. To safeguard the sensitive business data, we have a tendency to use the enterprise-level good contract rather than ancient dealings records to avoid wasting and manage food knowledge also as verify the identity of enterprise. During this means, we will make sure the security of knowledge and avoid spam attacks.

**FUTURE ENHANCEMENT:**

In the future, we will extend the framework to implement varied deep learning algorithms and conjointly implement in varied applications with improved accuracy system.

## REFERENCES

[1] Prashar, Deepak, et al. "Blockchain-based traceability and visibility for agricultural products: A decentralized way of ensuring food safety in india." Sustainability 12.8 (2020): 3497.
[2] Hao, Zhihao, et al. "A novel visual analysis method of food safety risk traceability based on blockchain." International journal of environmental research and public health 17.7 (2020): 2300.
[3] Lin, Qijun, et al. "Food safety traceability system based on blockchain and EPCIS." IEEE Access 7 (2019): 20698-20707.
[4] George, Reno Varghese, et al. "Food quality traceability prototype for restaurants using blockchain and food quality data index." Journal of Cleaner Production 240 (2019): 118021.
[5] Behnke, Kay, and M. F. W. H. A. Janssen. "Boundary conditions for traceability in food supply chains using blockchain technology." International Journal of Information Management 52 (2020): 101969.
[6] Zhang, Xin, et al. "Blockchain-based safety management system for the grain supply chain." *IEEE Access* 8 (2020): 36398-36410.
[7] Yadav, Vinay Surendra, and A. R. Singh. "A systematic literature review of blockchain technology in agriculture." Proceedings of the International Conference on Industrial Engineering and Operations Management. 2019.
[8] Madumidha, S., et al. "A theoretical implementation: Agriculture-food supply chain management using blockchain technology." 2019 TEQIP III Sponsored International Conference on Microwave Integrated Circuits, Photonics and Wireless Networks (IMICPW). IEEE, 2019.
[9] Salah, Khaled, et al. "Blockchain-based soybean traceability in agricultural supply chain." IEEE Access 7 (2019): 73295-73305.
[10] Huang, Haihui, Xiuxiu Zhou, and Jun Liu. "Food supply chain traceability scheme based on blockchain and EPC technology." International Conference on Smart Blockchain. Springer, Cham, 2019.

[11] Iftekhar, Adnan, et al. "Application of blockchain and Internet of Things to ensure tamper-proof data availability for food safety." Journal of Food Quality 2020 (2020).
[12] Patelli, Niccolò, and Mauro Mandrioli. "Blockchain technology and traceability in the agrifood industry." Journal of Food Science 85.11 (2020): 3670-3678.