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ijirset@gmail.com



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Blockchain-Based Agri- Food Supply Chain

Nilesh Mahadik¹, Manish Kamble¹, Mayur Ghule¹, Gopal Ghute¹, Prof. Jaitee Bankar²

B.E Students, Department of Information Technology, RMD Sinhgad School of Engineering, Warje, Pune,
Maharashtra, India¹

Department of Information Technology, RMD Sinhgad School of Engineering, Warje, Pune, Maharashtra, India²

ABSTRACT: The globalized manufacturing and the distribution of agriculture manufacturing deliver a renewed awareness at the safety, quality, and the validation of numerous crucial criteria in agriculture and meals deliver chains. The growing range of problems related to food safety and infection dangers has hooked up an incredible need for powerful traceability solution that acts as a vital high-quality control device making sure good enough protection of merchandise within the agricultural supply chain. Block-chain is a disruptive era that could provide an innovative solution for product traceability in agriculture and meals supply chains. Our proposed solution gets rid of the want for a depended on centralized authority, intermediaries and presents transactions information, improving performance and safety with high integrity, reliability, and protection. All transactions are recorded and saved in the block-chain immutable ledger with links to a decentralized record system and consequently presenting to all a high degree of transparency and traceability into the deliver chain environment in a comfortable, relied on, dependable, and green manner.

KEYWORDS: Block chain Technology, hash value, supply chain, agri food.

I. INTRODUCTION

Agriculture in India is livelihood for a majority of the population and can never be underestimated. Tracking the development of agricultural products and green logistics control in food and agricultural deliver chain is important to make certain product protection. The developing concerns approximately meals protection and contamination dangers have renewed the focus for stronger traceability across the supply chain. Similarly agricultural merchandise being traded throughout numerous international locations require specific tracking and conformance to us. Precise rules. Traceability of products in agricultural deliver chain calls for series, verbal exchange and management of important statistics by using precisely identifying the foundation, numerous statistics exchanges inside the deliver chain. The dynamic nature of facts within the agricultural/meals deliver chain wherein products are produced, processed and dispatched via several intermediaries makes it tough to song and hint. Product infection and its implications to public fitness strongly emphasize traceability as vital coverage device closer to monitoring food fine and safety. The current practice of traceability in agriculture deliver chain largely suffers from facts fragmentation and centralized controls which prove at risk of both statistics modification and management. Man or woman ranges in meals supply chains often have suitable traceability but trade of facts between tiers proves to be hard and time eating. Latest era tendencies thru the application of blockchain generation can offer a significant and realistic answer ensuring traceability of agricultural produce and eliminates the need for a trusted centralized authority. Blockchain generation has received monstrous reputation among supply chain and logistics community due transparency and immutability of transactions, enhances trust amongst participating stakeholders. Due to its tamperproof, relied on, secure and traceable nature, blockchain can be deployed correctly in the agriculture and food deliver chain control. The general structure and functioning of food deliver chain is huge and complicated concerning more than one stakeholders ranging from farmers, manufacturers, processors, and clients. food and agricultural deliver chain is getting a whole lot of attention from the studies network because of complicated lengthy deliver chain, from raw substances to the stop purchaser makes it extraordinarily tough and time-eating in monitoring back the origin of a product. as a result, there's a need to create a comfortable framework for monitoring details about the starting place, farming techniques adopted, and safety of the food product throughout the deliver chain cycle with out a 3rd celebration or centralized manage.

The blockchain is basically an immutable and decentralized, shared public ledger of transactions which lets in participants to preserve track of transactions without relevant record maintaining. Blockchain is a shared allotted ledger composed of upload-on blocks that include details of all transactions records, execution consequences and is traceable. Every block is hashed and linked to the following block, making it a relaxed chain of immutable and tamper-evidence

records. The overarching objective of this paper is to illustrate how blockchain can correctly trace and music and permit flawless integration of enterprise transactions and workflows in the agricultural supply chain. We suggest, put in force, and analyze a blockchain framework to offer traceability and visibility inside the meals deliver chains.

II. RELATED WORK

This paper gives, through its methodology, an in depth analysis of the block-chain in shape within the deliver chain industry. It defines the specific elements of block-chain that have an effect on deliver chain together with scalability, overall performance, consensus mechanism, privacy issues, location proof & fee [1].

In this paper, the author propose a modern blockchain-primarily based IIoT structure to help build a greater secure and reliable IIoT machine. Via analyzing the fast-comings of the prevailing IIoT architecture and the advantages of the Block-chain technology. We decompose and reorganize the original IIoT architecture to form a new, multi-center, partially decentralized architecture. Thus, the proposed structure represents a giant improvement of the original architecture, which offers a new course for the IIoT improvement [2].

Data mining framework for avoidance & revealing of financial statement fraud in this examine. The framework used in this study observe the traditional go with the flow of statistics mining. These beneficial variables are getting used for enforcing association rule mining for prevention and 3 predictive mining strategies particularly okay-means, Multi-stage Feed forward community, Genetic programming for detection of financial fraud [3].

In this paper, the author suggest a block-chain permit well-organized facts collection and at ease sharing scheme combining Ethereum block-chain and deep reinforcement-mastering (DRL) to create a reliable and safe surroundings. in this scheme, DRL is used to attain the highest quantity of accumulated records, & the block-chain era is used to guarantee safety & reliability of records sharing [4].

Blockchain is characterised by way of its decentralized nature, integrity of the records saved within the chain and its openness. Because of these traits, any other region in which Blockchain can be used is to launch government finances for a challenge. Normally whilst a mission is allocated budget, there may be no knowledge as to how these funds are being used and a huge a part of it is in no way proven in information due to corruption. To clear up this trouble, a machine has been proposed using Blockchain to provide the transparency [5].

This paper proposed a new facts sharing scheme based totally on blockchain era. Customers can control their records and recognize the facts being collected about them and a way to use it without trusting any third celebration. But, the scheme did not remember the opportunity of the enterprise itself tampering with facts [6].

records mining framework for prevention & detection of economic assertion fraud these informative variables are being use for enforcing association rule mining for prevention & 3 predictive mining strategies particularly k-way, Multi-stage Feed forward community, Genetic programming for detection of monetary fraud. This research is capable of save you fraudulent financial reporting & become aware of it if control of the employer is able to perpetrating monetary announcement fraud regardless of the presence of anti-fraud environment [7].

on this paper, an well-known adaptive fuzzy manage scheme through output monitoring error remarks has been proposed for practical output monitoring of a class of uncertain nonlinear structures with immeasurable states and completely unknown dynamics consisting of parametric and/or structural uncertainties and external disturbances. The proposed scheme gives a powerful tool for target monitoring of unmanned cars, missiles, cell robots, and so forth. Every time most effective tracking error (discrepancy) can be available [8].

This paper describes a method for combining consumer understanding with robotically generated regulations. The overall performance did in a few instances provide higher outcomes but overall the development was now not extensive, this could be because of the strategies that were tested. any other observation this is crafted from these effects is that although there was a few variant inside the performance with recognize to returns, the danger-adjusted performance changed into plenty greater solid [9].

on this paper, we advise a product traceability gadget primarily based on blockchain era, in which all product moving histories are continually recorded in a dispensed ledger via the usage of clever contracts and a sequence is fashioned that

could hint again to the source of the products. Our device has obvious decentralized characteristics, which substantially reduces the possibility of privately tampering with records inside organizations. Our device is characterised by way of records accessibility, tamper proofing, and resistance to man-in-the-middle assaults [10].

III. PROPOSED METHOD

Proposed system analyze a block-chain framework to provide traceability and visibility in the agriculture supply chain. We present, implement, and test algorithms that govern and ensure the proper interactions among key stakeholders in the agriculture supply chain. Our solution eliminates the need a trusted centralized authority and provides transactions and records for food supply chain management and safety with high integrity, reliability, and security.

Architecture

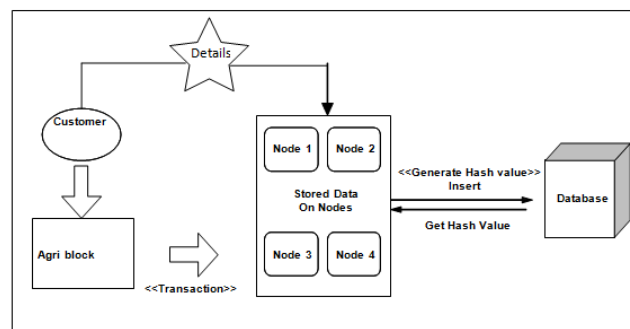


Fig.1 System Architecture

IV. CONCLUSION

In summary, blockchain technology can help us to build a trusted, self-organized, open and ecological smart agriculture system, which involves all parties in the ecosystem; even they may not trust each other. To the best of our knowledge, this is the first work that applying blockchain technology on traditional agriculture ecosystem to solve the food safety issues. The proposed work implements the methods that govern and ensure the proper interactions among key stakeholders in the agriculture supply chain. In this system we are going to add an NGO authority for saving the wastage of food.

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