OPEN ACCESS INTERNATIONAL JOURNAL OF SCIENCE & ENGINEERING

APPLICATION OF BCT IN AGRICULTURALSUPPLY CHAIN MANAGEMENT

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Abstract: As a software infrastructure that incorporates cryptographic, data processing, networking, and incentive mechanisms to enable the authentication, execution, and documentation of transactions between parties, block chains are now firmly developed. While blockchain systems were initially designed to promote new types of digital currencies in order to make exchanges faster and safer, as a new foundation for all modes of transactions, they now hold great potential. As a platform for performing 'intelligent contracts' for transactions, especially for high-value goods, Agriculture industry stands tobecome a key beneficiary of this technology. First, Differentiating between private digital currencies and their underlying decentralized management and block chain technology is essential. The distributed and cross-border architecture of digital currencies such as bitcoins indicates that the adoption of the main protocols of these networks by central banks is unlikely to be successful. Financial institutions focus more on knowing 'on-ramps' and 'off-ramps' which constitute the links to the traditional payment service, instead of being able to track and control the currencies themselves. Unlike the digital currency element of the block chain, The block chain function has the potential to be widely used in industrial and agricultural financing, especially where processes include many different parties with no trustworthy centralized authority.

Keywords: *Agriculture, supply chain, Blockchain, Cryptography, etc.*

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I INTRODUCTION

The growing need for greater food awareness in society reflects a need for greater transparency and lack of trust. More and more food items and beverages are being branded at the same time and a variety of certification schemes are being pursued, with a growing possibility of bribery and adulteration (the marketing of unqualified products with high-quality marks or claims).

In the present situation, a major portion of audit data and records is reviewed and stored by reputable third parties on paper or in a consolidated archive, and certain information problems, such as high costs and inefficiency of paper-based processes and theft, abuse and mistake, are considered to suffer from these approaches on paper and in computer systems. These data problems, which suggest that the new transparency and trust mechanisms have not been able to solve the problems of lack of transparency and trust in the agri-food supply chains or have sometimes even increased them, cause significant damage to food security, performance and sustainability of food. Nutritional quality has become a major concern in particular. Food integrity applies both physically and digitally to the fairness and authenticity of food in food value chains, and somewhere in the physical layer, the digital layer must provide consistent and credible facts regarding the origin and source of food items. Blockchain technology offers a way of ensuring recordpreservation and potentially enabling the sharing of information in a food value chain between disparate players. This ability can lead to a fascinating paradigm shift that encourages openness and faith in food chains that maintain the integrity of food..

II RELATED WORK

Blockchain-Based Traceability of soybeans in theagricultural supply chain.

Nishara Nizamuddin, Khaled Salah, Mr. Raja Jayaraman, Mohammad Omar

Published in: The proposed solution removes the need for a centralized confidential authority, mediators and provides business logs, enhancing effectiveness and security with high integrity, reliability, and security. IEEE Access (Volume: 7). The proposed solution emphasizes the use of smart contracts within the supply chain ecosystem to control and regulate all interactions and transactions between all participants involved. All transactions are documented and stored with links to a decentralized file system (IPFS) in the blockchain utter ledger, thereby providing everyone with a high degree of accountability and traceability in the chain ecosystem. To deliver efficiently, effectively, consistently, and skillfully.

A practical execution in Blockchain traceability Agricultural Food supply chain management:

Miguel Pincheira Caro; Raffaele Giaffreda; Muhammad Salek Ali; Massimo Vecchio; Published in 2018 IoT Agricultural Vertical and Topical Conference - Tuscany (IOT Tuscany) This article offerings Agricultural Block IoT, a fully distributed, blockchain-based explanation of tracking for Agricultural supply chain management, capable of generating all-in-one IoT products and irrepressible digital data next to the chain. First, in order to successfully compute Agricultural Block IoT, we specified a classical use-case within the givenvertical area, namely from-farm-to-fork. Then, using two separate blockchains, namely Ethereum and Hyper register Sawtooth, we developed and organized such use-cases, completing traceability. Finally, in terms of latency, Processor, and network utilization, we measured and equated the concert of both deployments, even highlighting their leading pros and cons.

Blockchain-Based Derivation for Agricultural Crops: A Distributed Platform with Repetitive and Shared Bookkeeping.

Jing Hua; Xiujuan Wang; Mengzhen Kang; Haoyu Wang; FeiYue Wang;

IEEE Intelligent Vehicles Symposium published in:2018 (IV)

In this article, a structure of agricultural origin is suggested that focuses on blockchain strategies, defined by decentralization, mutual maintenance, consensual trust and accurate data, in order to address the crisis of trust in the supply chain of goods. Recorded knowledge includes managementoperations (fertilization, irrigation, etc.) with a certain data structure. Applying blockchaintechniques to the origin of agricultural products not only extends the domain of blockchain application, but also promotes the development of a trustworthy community of stakeholders in the field of agriculturalproduction.

An agricultural supply chain traceability system for China based on RFID and blockchain technologies.

Feng Tian

Published in: 2016 Thirteenth ICSSSM, or International Meeting on Provision of Services and Administration Services..

In this article, we first investigate the evolution of blockchains and also the growth of RFID, short for Radio Frequency Identification. Let's analyze the benefits of using RFID and the drawbacks. The development of blockchain in the design of the system for agri-food supply; finally, we suggest a strategy for building this framework. The traceabilityof specific information in the agri-food supply chain can be checked, which will effectively ensure food safety, through the collection, transfer and exchange of authentic data on agricultural foods during the production, processing, storage, distribution and sale of links . Blockchain technology to keep food supply information.

III PROPOSED SYSTEM

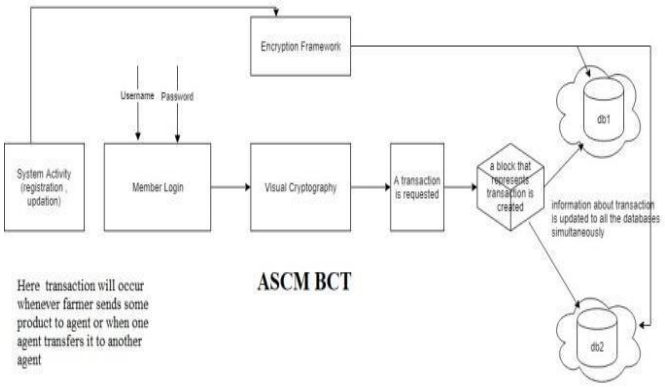

Figure 1 Proposed system architecture

The record of that transaction is stored as a hash value in a block if a transaction occurs in the system. The next block will be connected to the previous block and a virtual blockchain will be created in this manner. The hash value of the new block is generated using data from the current block and previous block hash This way, if one of the blocks is hot, the entire hash of the block must be updated later. These numerous copies are stored on separate servers, maintaining data security and confidentiality. Since everything is done through the application interface, it is possible to maintain responsibility in managing the agricultural supply chain.

IV ALGORITHMS

AES is being used to encrypt the database. In specific, a series of specially derived keys called round keys is used in the encryption process. These refer to an array of data that includes only one block of data, the information to be encrypted, and other operations. This is what we term the State Array.

STEPS:

1. Derive the round key set from the encryption key.
2. Initialize the state collection of data from the data block (plaintext).
3. Add the original round key to the start state array.
4. Execute nine rounds of state manipulation.
5. Carry out the tenth and final cycle of plant operations
6. Copy the list of final states as encrypted data (ciphertext)

SHA 256:

A cryptographic hash function with a 256-bit digest length (secure hash algorithm, FIPS 182-2).It's a hash without a key; that's an MDC (Manipulation Detection Code). Blocks of 512 is equal with 16 and 32 bits, each block requiring 64 rounds, are processed with a message. A cryptographic hash (sometimes referred to as a digest) is a type of text or data file signature. SHA-256 produces a 256-bit near-unique text signature (32 bytes).None of encryption and decryption perform to get the original text. In comparison to decrypting the text to get the original version, this makes it appropriate to compare hashed versions of texts when appropriate. In your paper title, if the words “that uses” can accurately replace the word “using”, capitalize the “u”; if not, keep using lower-cased. Be aware of the different meanings of the homophones “affect” and “effect”, “complement” and “compliment”, “discreet” and “discrete”, “principal” and “principle”.

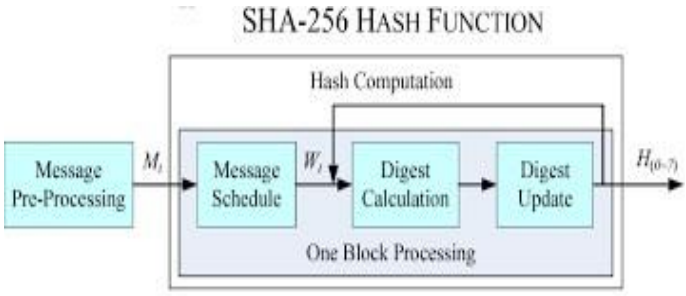

Figure 1. SHA-256 algorithm flow diagram

Outcomes:

1. Distributed database using WLAN.
2. Implementation of visual cryptography for user login.
3. Database encryption using AES
4. Block chain generation using SHA 256

V CONCLUSION:

We have thus introduced a web-based prototype software framework in Java for the application of BCT in supply chain management. We've introduced a blockchain feature like:

1. Decentralization
2. Visual Cryptography
3. Hash Algorithm
4. Encrypted Database.

REFERENCES

[1] F. Lv and S. Chen, "Research on Forming a Traceability System of Quality and Safety of Agricultural Products Based on Blockchain Technology," Rural Economics Research, vol. 12, pp. 22-26, 2016.

[2] Y. Yang and Z. Jia, "Application and Challenge of Blockchain Technology in the Field of Agricultural Internet of Things," Information Technology, vol. 258, pp. 24-26,2017.

[3] S. Nakamoto, â€˜â€• Bitcoin: A peer -to-peer electronic cash system,â€• Consulted, 2008.

[4] Y. Yuan and F. Y. Wang, â€˜Blockchain: The State of the Art and Future Trends,â€™ Act Automatica Sinica, 2016. [5] Y. Yuan, T. Zhou, A. Y. Zhou, Y. C. Duan, and F. Y. Wang, "Blockchain Technology: From Data Cleverness to Knowledge Automation," Zidonghua Xuebao/actaAutomatica Sinica, vol. 43, pp. 1485-1490, 2017.

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e- National Conference
On
Advances in Modern Technologies of Multidisciplinary Research in Engineering Field (AIMTMREF)
[20th -21st May, 2021]
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