Supply Chain Management in Agriculture using Blockchain

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Abstract: *Block chains are now firmly established as a digital technology that combines cryptographic, data management, networking, and incentive mechanisms to support the verification, execution, and recording of transactions between parties. While block chain technologies were originally intended to support new forms of digital currency for easier and secure payments, they now hold promise as a new foundation for all forms of transactions. Agribusiness stands to become a key beneficiary of this technology as a platform to execute 'smart contracts' for transactions, particularly for high-value produce. First it is important to distinguish between private digital currencies and the distributed ledger and block chain technologies that underlie them. The distributed and cross-border nature of digital currencies like Bit coin means that regulation of the core protocols of these systems by central banks is unlikely to be effective. Monetary authorities are focused more on understanding 'on-ramps' and 'off-ramps' that constitute the links to the traditional payments system rather than being able to monitor and regulate the currency itself. In contrast to the digital currency feature of block chain, the distributed ledger feature has the potential for widespread use in agribusiness and trade financing, especially where workflows involve many different parties with no trusted central entity*

Keywords: Block chains

I. INTRODUCTION

1.1 OVERVIEW

An increasing demand in society for greater information about food reflects the need for more transparency and the lack of trust. At the same time, more and more food products and beverages are branded and accompanied by a variety of certification schemes, with an increasing risk of fraud (selling unqualified product with high quality labels or claims) and adulteration.

In the current situation, much of the compliance data and information is audited by trusted third parties and stored either on paper or in a centralised database and these approaches are known to suffer from many informational problems such as the high cost and inefficiency of paper-based processes and fraud, corruption and error both on paper and in IT systems.

These information problems, indicating that current transparency and trust systems have not been able to solve or at times even have exacerbated the problems of low transparency and trust in agrifood chains, pose a severe threat to food safety, food quality, and sustainability. In particular, food integrity has become a major concern. Food integrity refers to the fairness and authenticity of food in food value chains both at the physical layer and the digital layer, where the digital layer should provide reliable and trustworthy

II. LITERATURE SURVEY

A model in Agri-food Supply Chain Costing using ABC Costing: A empirical research for Peruvian coffee supply chain Andrea Villalva-Catano,~ Edgar Ramos-Palomino, Kelsey Provost, Eduardo Casal DOI 10.1109/IESTEC46403.2019.00009 2019 7th International Engineering, Sciences and Technology Conference (IESTEC) This article examines the fundamental causes of Peruvian coffee's high logistical costs in the supply chain. A cost analysis technique will aid in the exploration, analysis, and development of high supply chain costs in order to

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stabilise the current coffee crisis. Indeed, the findings were studied in order to improve, assist, and aid small-business growth over time.

A Theoretical Implementation: Agriculture- Food Supply Chain Management using Blockchain Technology S. Madumidha1, P. Siva Ranjani2, U.Vandhana3, B.Venmuhilan4 978-1-7281-1034-9/19/2019 IEEE This paper describes a fully decentralised blockchain-based traceability system that can be used to create agricultural building blocks that are continuously integrated with IoT devices from provider to consumer. To do so, we created the "Provider-Consumer Network," a fictional end-to-end food traceability system. The goal is to establish a distributed ledger that is available to all network users and so provides transparency.

III. SOFTWARE REQUIREMENT SPECIFICATION

3.1 PROJECT SCOPE
- To develop prototype model for agricultural supply chain management.
- This model will be run at local host using Glassfish server.
- BCT features such as decentralization, cryptography and hash codes will be implemented.

3.2 ASSUMPTIONS AND DEPENDENCIES
This document will provide a general description of project, including user requirements, product perspective, and overview of requirements, general constraints. In addition, it will also provide the specific requirements and functionality needed for this project such as interface, functional requirements and performance requirements.

3.2.1 User Classes and Characteristics
Find the different user classes that you anticipate will use this product. User classes can be differentiated based on use frequency or product functions subset

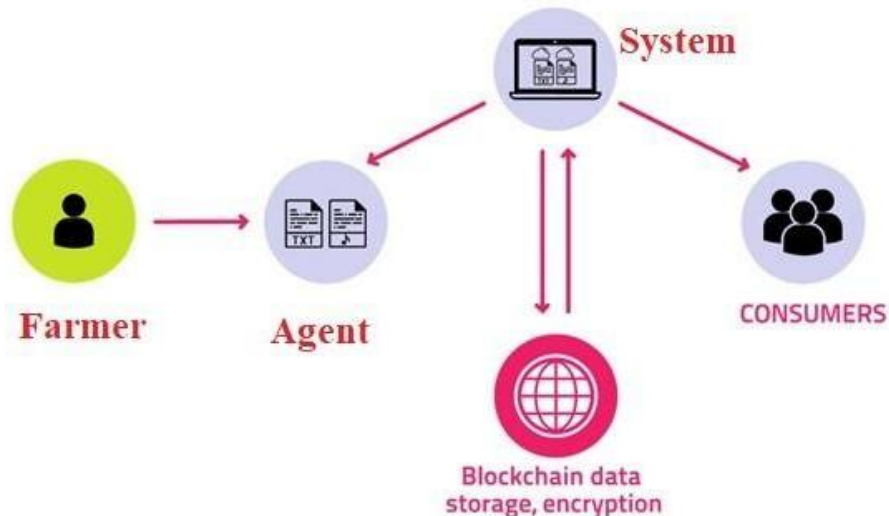## IV. SYSTEM DESIGN

4.1 SYSTEM ARCHITECTURE

Figure 4.1: System Architecture

Whenever any transaction will occur in the system , the record of that transaction is maintained in the form of hash value in a block. Each next block will get attached to the previous block and in this way a virtual block chain will occur. The hash value of a current block is generated using the data of a current block and the hash of the previous block. In this way if any of the block is tempered the subsequent all the block's hash must be changed . Such multiple copies are maintained at different servers , which will assure the data security and

V. PROJECT PLAN

Phase	Task	Description
Phase1	Analysis	Analyze the information related to Project Topic
Phase2	System Design	Assign the module and design the process flowControl
Phase3	Implementation	Implement the code for all the modules andintegrate all the modules
Phase4	Testing	Test the code and overall process weather the process works properly Test the code and over all process weather the process works properly
Phase5	Maintenance	Modification of a software product after delivery to improve performance or maintainability.

Reconciled Estimates

5.1 PROJECT ESTIMATE

Sr. No.	Milestone Name	Milestone Description
1.	Requirement Analysis	Complete specification of system

VI. PROJECT IMPLEMENTATION

6.1 OVERVIEW OF PROJECT MODULES

BCT: First and foremost, blockchain is a public electronic ledger built around a P2Psystem that can be openly shared among disparate users to create an unchangeable record of transactions, each time-stamped and linked to the previous one. Every time a set of transactions is added, that data becomes another block in the chain (hence, the name). Blockchain can only be updated by consensus between participants in the system, and once new data is entered it can never be erased. It is a write-once, append-many technology, making it a verifiable and auditable record of each and every transaction. Famer will transfer the products to the agent through the application interface, agent in turn will transfer any product to another agent through application interface only. Also the record of each and every transaction will be maintained at different places which will maintain transparency also the database is secured through AES. System loginis secured through visual cryptography.

6.2 TOOLS AND TECHNOLOGIES USED

JDK 1.8 Installation 1. Double click jdk-8-ea-bin-b32-windows-i586 to run the installation program. JDK License dialog displayed. Accept the license in order to install JDK.

The JRE Custom setup dialog enables you to choose a custom directory forJRE Files. 3. The complete dialog indicates a successful installation.

Net Beans IDE 7.3.1 Installation To install the software:

After the download completes, run the installer. For Windows, the installer executable file has the .exe extension. Double-click the installer file to runit. 2. If you downloaded the All bundle, you can customize your installation.

VII. CONCLUSION

Thus we are are going to implement a prototype web based software application in Java for application of BCT in supply chain management . We will implement block chain features such as: 1. Decentralization 2. Visual Cryptography 3. Hash Algorithm 4. Encrypted Database. Thus it is possible to track agricultural supply chain and to give minimum price for agricultural products.

FUTURE SCOPE

In future we will try for sponsorship from government and will implement aproject on large scale with some domain and hosting space online.

APPLICATIONS

* Farmers

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- Government Organizations
- Banking Sector.
- Educational System

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