

# AGRO TRADE: A BLOCKCHAIN BASED DECENTRALIZED PLATFORM FOR TRADING AND AGRICULTURAL PRODUCTS

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**Abstract** –Block chain technology is emerging as a decentralized and secure infrastructure which can replace involvement of a third party to verify the transactions within the system. Each transaction and events related to a product is validated by peers of the Block chain system. Proposed solution provides secure platform for valuation of agricultural products. Use of block chain in agriculture is one of the compelling use cases that make the process of growing and supplying food simpler.

The agriculture provides chain is ready to supply all concerned parties with one supply of trust. The involvement of multiple agents yields high costs to the system and makes the entire process time consuming. With the block chain, the whole process can be implied to a single distributed ledger. A public Block chain concept was selected instead of a private Block chain in this study to ensure transparency by allowing any person to access the network.

**Key Words:** Block chain, Consensus, Smart Contract, Ethereum, Solidity

## INTRODUCTION

India could be a developing country, the bulk of its population belong to the agricultural space, and their primary job is agriculture. It is an influential agricultural power house worldwide, having farmers and all related workers as its backbone.

Like several different sectors, the agricultural landscape additionally faces decades-long issues and sudden challenges that are crucial to rectify. Some of them are:-

**Low productivity:** Republic of India remains fighting the matter of low productivity. Its output per area unit is way but that of alternative countries.

**Disguised unemployment:** Disguised unemployment is rampant within the agricultural sector, even today, owing to joint family holdings, the quantity of persons performing on a chunk of land is way quite what's required.

**Subsistence farming:** Farmers still grow crops to satisfy the requirements of their family and to not earn profits.

**Traditional methods of farming:** Traditional ways of farming: Most farmers still use the antique ancient ways of farming. Modern inputs like tractors, fertilizers, insecticides, pesticides are not used by farmers due to lack of funds and information.

**Small holdings:** this is often a characteristic feature of Indian agriculture. This ends up in low productivity and compounds the matter of agriculture. Also, such holdings aren't contributing to be used of contemporary technology.

**Lack of organized marketing system:** Indian agriculture aces a lack of An organized marketing system. A large number of farmers continue to sell their produce in the local markets at low prices.

Dependent on third parties: Farmers are dependent upon third parties like mind is and vendors to sell their crops hence getting less payment than it is supposed to be.

1. Too several intermediaries, data asymmetry: with in the agriculture provide chain, crop moves from farm to warehouse to wholesaler/distributor to distributor to client. the worth of the crops gets modified at every step. each negotiant adds its own profit proportion to the initial worth leading to the upper worth of the crop for the end-user whereas the farmer still gets a really little a part of the ultimate quantity. Also, because of the dearth of variable-natured technology, there remains spatial property in information/data shared among the stakeholders.
2. Lack of transparency and traceability within the agriculture provide chain: From the cultivation, treatment, and gather within the field to transportation, storage, internal control to production so to the client, the main points aren't maintained in any uniform means.. All de-tails are tracked and made available on the Block chain system that the customer can verify.

3. Reducing the transaction delay/charge (by avoiding or reducing the role of intermediaries): In developing economies like India, where poor farmers are made to pay high premiums, Block chain solution cuts out the middle person, resulting in higher profit gain on the part farmers, reduction in processing time & cost and ease in product and transaction chain management in agriculture.
4. Misusing and tempering of records: within the current situation, the worth of a crop/product varies on a daily basis primarily because of international market modification and therefore the quality of the merchandise. One could attempt to sell a low-quality product at high costs or vice-versa with manual tempering. Technology is wont address several problems within the agriculture sector. One of such technologies which have emerged for the last few years is Block chain technology. In the next subsection, we describe how Block chain technology can be utilized to address the issues raised above.

4	2019IEE E	[4]In the transaction, the energy is transferred using the Energy Storage System(ESS) that the vendor and the customer also belong, and payment is formed by transferring the token through a transaction. supported this info, this paper suggests proposes a peer-to-peer (P2P) system which will freely trade the produced energy.	[4]Block chain, Smart Contract, Energy Trading, Smart City, ERC20 Token.
5	2017	[5]The Exchange (trading) will be made by highlighting security and transparency, which are essential in the block chain. Finally, find what are the limits or inconvenience resulting from block chain adoption in agriculture.	[5]agriculture; transparency; security; traceability

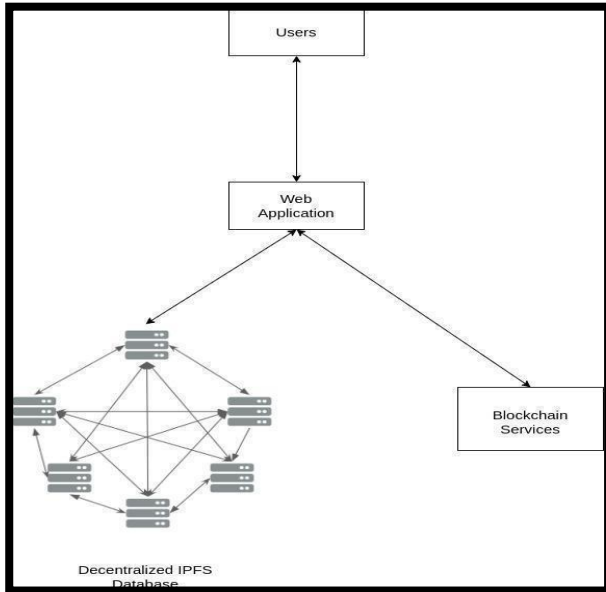
**RELATED WORK**

Sr. No	Publication Year	Findings	Methodology
1	2018IEE E	Agri Block IoT, a fully decentralized, block chain-based traceability solution for Agri-Food supply chain management, able to seamlessly integrate IoT devices producing and consuming digital data along the chain.	[1]IoT, Agro-Food, Block chain
2	2019	A unique Quick Response code was used to identify each product within the supply chain. The proposed system has been implemented as a prototype and validated within the study.	[2]Agriculture, Supply chains, Food security
3	2019 Elsevier	[3] This work set basis for the event of Bitcoin, the first cryptocurrency that allowed reliable money transactions while not the necessity of a trustworthy central authority, like banks and money establishments	[3]Digital Agriculture, Food Supply Chain

**WORKING OF PROPOSED SYSTEM**

The block chain technology permits peer-to-peer transactions to require place transparently associated while not the necessity for an mediator sort of a bank (such as for cryptocurrencies) or a middleman within the agriculture sector.. By eliminating the requirement for a central authority, the technology changes the approach that trust is granted – rather than trusting Associate in Nursing authority, trust is placed in cryptography and peer-to-peer design. It so helps restore the trust between producers and shoppers, which might scale back the dealings prices within the agri-food market. The block chain technology provides transparency among all concerned parties and facilitates the gathering of reliable information. Block chain will record each step in an exceedingly product’s price chain, go a product’s creation to its death. The reliable information of the farming method ar extremely valuable for developing data-driven facilities and insurance solutions for creating farming smarter and fewer vulnerable.

### System Architecture



### Problem statement

Our aim is to build a decentralized platform using block chain where farmers and vendors can efficiently communicate to buy/sell agricultural products and implement secure system to control money transactions which will be permanently stored to an immutable ledger.

1. Focus on the reviews of the product and give your recommendations based on the best review
2. Building such a system is to simplify your clients' search of products or content.
3. To provide recommendations based on recorded information
4. We predicted Sales easily.
5. We grow the business by using this concept

### Mathematical Model

#### Mathematical Model

S=I,E,O  
 Let S be the proposed system which can be represented as  
 Input Data:  $I(Z) = I_1, I_2, I_3, I_4, I_5$   
 $I_1$ =User Name  
 $I_2$ =Password  
 $I_3$ =File  
 $I_4$ =Key response  
 $I_5$ =Device secrete key  
 Intermediate Data:  $E(Z) = E_1, E_2, E_3, E_4$   
 $E_1$ =Authorized  
 $E_2$ =Encrypted  
 $E_3$ =Decrypted  
 $E_4$ =Attacker  
 Output Data:  $O(Z) = O_1, O_2$   
 $O_1$ =Block Attacker  
 $O_2$ =Download File

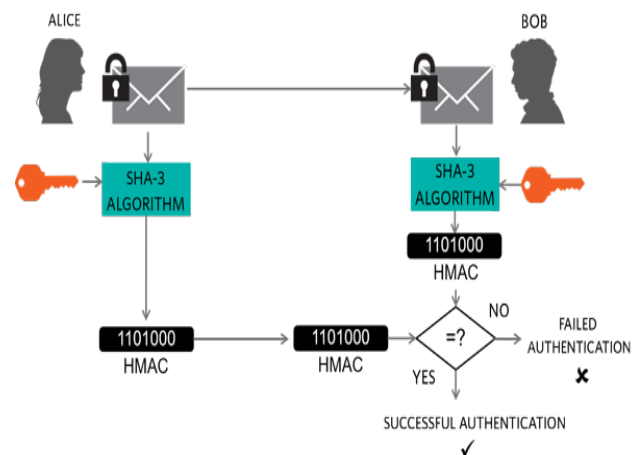
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### Algorithm

#### SHA algorithm :

Alice sends the resultant HMAC in conjunction with the message to Bob. Bob then generates his own HMAC of the message mistreatment an equivalent key Alice shared with him earlier. Bob compares the HMAC he generated with the one he received from Alice. If they match, the message has not been tampered with and is authentic.

In this state of affairs, somebody might intercept the HMAC and therefore the message so alter the message and generate a brand new HMAC and send it to Bob. However, which will not work, as a result of the attack aircraft won't have the key key and therefore the received HMAC won't match the computed HMAC. Thus, Bob can notice that the message wasn't authentic. the foremost vital side of this sequence is for Alice and Bob to stay their shared key a secret from everybody else.



Message Authentication using SHA-3

### Conclusion

At the end of project implementation, we have successfully built a reliable, fault tolerant decentralized platform for trading agricultural products by completely eliminating middleman and providing farmers and vendors" apt price. This will help in building trust between clients.

Block chain technology is an emerging infrastructure which can replace the involvement of a middleman to carry out transactions. Each transaction and events related to a product is validated by peers of the system. Proposed solution provides secure platform for valuation of agricultural products.

The supply chain can provide all involved parties with a single source of trust. The involvement of multiple agents yields high costs to the system and makes the entire process time consuming. With the block chain, the whole process can be implied to a single distributed ledger.

Block chain technologies and e-commerce sites are forming an economic ecosystem that is viable to both consumers and online retailers. As online retailers square measure chop chop adopting the distributed ledger technology in their business processes, they notice new ways in which of serving their customers.

Block chains offer them an effective way of improving their customer experience. Here are other opportunities that block chain technologies will create in the e-commerce market.

Merchandisers from completely different elements of the globe ar turning to e-commerce as a shopfront for his or her business endeavors.. Block chains are acting as the backbone of online sales and payments. Besides being faster and cheaper, block chains facilitate all activities that current commerce systems allow.

Since the longer term is close, we are able to solely democratize the economy by creating finances and commerce additional clear. Block chain technology seeks to capture the power of financial institutions to allow people to have control over their transactions

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