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Public Robotic Tracker for Mechanised Distribution of Loading/Unloading of Food Grains in Agriculture Field with Artificial Intelligence

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Abstract

The globalisation of manufacturing and the distribution of agricultural products has allowed for a renewed emphasis on the safety, efficacy, a number of key criteria in the food and agriculture supply chain, as well as their confirmation. Statistics on food safety and corruption threats have prompted a pressing need for an efficient traceability system, which acts as a vital quality control tool required to guarantee sufficient product safety across the husbandry force chain. Block chain is a cutting-edge technology method that achieves a ground-breaking outcome for commodity traceability in food supply chains and in husbandry. Today's agrarian supply chains are intricate ecosystems with many different players, making it difficult to validate a number of key conditions, particularly with regard to the country of original origin, crop growth stages, compliance with quality standards, and yield monitoring. This study presents a technique that levitates the block chain and successfully carries out business operations throughout the agrarian supply chain in order to monitor crop prices and ensure traceability. The proposed framework eliminates the need for reliable centralised authority, intermediaries, and record-keepers, perfecting effective wisdom and safety with high integrity and dependability. All transactions are tracked and maintained in the force chain's immutable ledger, which is connected to a decentralised network, enabling a high level of traceability and transparency in the ecosystem of the force chain in a reliable, trustworthy, and effective way.

Keywords: Block chain, Smart contract, Transparency, Agriculture supply chain, Traceableness, food safety.

1. INTRODUCTION

In the agrarian supply chain, it is crucial to assure product safety, manage the expansion of husbandry products, and run the logistics system efficiently. The tracing power has been elevated once more across the forcechain as a result of the article concerning food safety and the possibility of impurity. Along with precise shadowing and adherence to nation-specific legislation, tilling items changed throughout several nations Tracing commodities in the agricultural sector necessitates the collection, exchange, and maintenance of crucial data by referring to the source and numerous data exchanges in the logistic network. Traceability is an essential regulatory tool for ensuring the quality and due to the sensitive nature of the data in the agriculture and food supply chain, where goods are produced, repurposed, and moved through several intermediaries, there is a risk to food safety.

Product impurity and its public health consequences highlight traceability. Data fragmentation and centralised controls that are vulnerable to both information revision and operation have a significant impact on the current traceability practise in the force chain of husbandry. If an impurity is found, the system promptly removes the product from the supply chain and identifies the source. The force chain of a moment is getting more complicated. There are numerous stakeholders present at the flamboyant stage. All of these parties involved must work together in a strong direction for effective functioning.

As the food industry grows more client-oriented, it is becoming more urgent to respond to food-related emergencies. Deceptive advertising, liability, and recalls are less likely when there are fewer unsafe or subpar products being manufactured and sold. Reducing the harmful impacts of poor food safety. The necessity to improve food safety and provide a mechanism to validate food quality traits is what is driving the growth of the traceability enterprise in the agri-food system. With the globalisation of the food industry, the significance of traceability has substantially expanded. To guarantee the calibre and security of the food served to clients, a reliable identification and shadowing system is necessary. Two systems created for communal or common ledge transactions are logically combined to create the block chain for supply chains. Typically, a diligence chain demonstrates how goods are transported across international boundaries. Food origin is one of the most challenging concerns for FSC. Businesses are now being impacted by this issue. End-to-end food tracking is incidental to the food assiduity because of a global force chain network, asymmetric food legislation, and different operational processes amongst thriving nations. Without a doubt, distributed ledger and block chain technology are essential and have the ability to significantly alter how the supply chain operates. This study shows how block chain technology has applications in manufacturing and perishable commodities. The blockchain technology is being quickly embraced by companies in the food supply chain.As evidenced by examples for retailers like Carrefour, block chain can be utilised to provide access to comprehensive and detailed information on food products, which is used to reduce the query about quality and component. In recent years, worries about the calibre of demi-tasse cuisine have dramatically increased. As obsolete Agri-Food logistical practises cannot keep up with changing customer expectations, the importance of developing a traceability framework for the Agri-Food Force is diminishing.

EXISTING SYSTEM

There is no automated mechanism in place to track agricultural costs. The planter cannot obtain agricultural items. In India, the husbandry assiduity supports 72% of the population. Growers receive massive crop production, but because they can survive the current conditions, they do not receive the proper price. They thereby commit suicide, and the government does nothing to stop them. So, by tracking the price of the agricultural output from planter to client, we are attempting to address this problem in the suggested approach.

PROPOSED SYSTEM

There are four distinct phases, and each one engages in essential interactions with the others.

Farmer: The individual farmers personal details will collected and stored, as well as the name of the crop and the crop's fair market value (FRP). The smart contract receives all the data and utilises the sha256 method to enforce the hash law. Moreover, the block was added to the network by cryptocurrency miners.

Dealer: Dealer has an account that may be used to log in and get data on prices for crops are set by the government and a certain association. Because the block chain is strict, the crop price and planter's information cannot be altered. As a result, the dealer knows both his own data and the prior hash law of the planter.

Sub Dealer: The government sets a predetermined price at which Sub Dealers may purchase items from the dealer. Sub dealers are also prohibited from raising the price of the item. Multiple hash laws can be induced every time data is altered since the block chain is inflexible.

Client: The client is the final reality in the block chain that triggers a product purchase. We can provide him our authenticated authorization to check the price of the item from the grower to the client because he doesn't know the exact cost of it. As a result, the buyer can learn about the chain and prices.

2. LITERATURE SURVEY

2.1 SUPPLYCHAIN-BASED AGRI-FOOD SUPPLY CHAIN

As they transform into automated, extremely complex networks in the ultramodern era, supply chains are becoming a substantial source of implicit advantages. The quality of food goods is another issue that is worrying customers. Even so, maintaining data traceability throughout the full chain network may be challenging. Traditional force chains are centralised and rely on a third party for commerce. Accountability, openness, and responsibility are demanded by these centralised systems.

2.2 AGRI-FOOD SUPPLY CHAIN MANAGEMENT USING BLOCK CHAIN TECHNOLOGY

It is more challenging to ensure the products' quality, worth, and origin because of the centralised data store. Therefore, we need a decentralised, transparent system that benefits everyone, from the directors to the clients. Traceability and transparency in the supply chain can be acquired thanks to digital technology known as "block chain." By using this technology, numerous stakeholders and growers' relationships are strengthened. The major characteristics of block chain are increased capacity, enhanced security, invariability, minting, quick agreement, and total traceability of recorded trade records.

3. METHODOLOGY

The word "block" is used to refer to each element of this database. Every time the sale status changes, a block related to the previous block is added to the block chain in a direct and consecutive order. The network's replication of the new block also ensures that each knot has the same block chain. There are duplicate block chains for each participant in this transaction. As a result, any party may consent to a particular sale. The requirement for centralised, trustworthy third-party proof of transgender behaviour was eliminated by this strategy. There are many applications for block chain technology, and it holds great promise for novel discoveries.

Block diagrams:

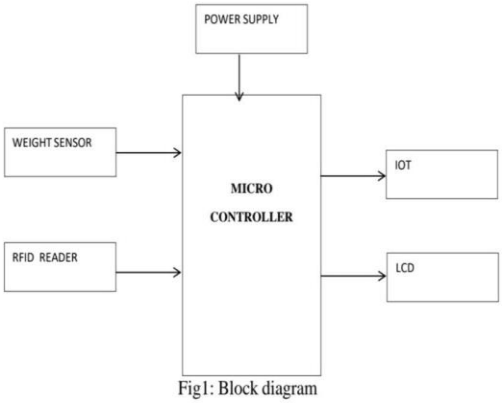
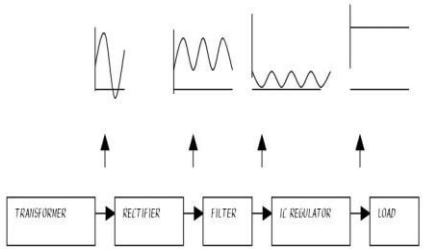


Fig 1:Microcontroller block diagram



Block Diagram of Power supply

Fig 2: Block Diagram of power supply

4. IMPLEMENTATION

The required modules, including a power supply, a microcontroller, an RFID reader, a weight sensor, IOT, and an LCD, are used to illustrate the prototype's process.

4.1 WEIGHT SENSOR

A weight sensor is a transducer that converts an input mechanical cargo, weight, pressure, contraction, or pressure into an electrical affair signal, per the specifications of a cargo cell. Force transducers are another name for weight detectors. A weight sensor is a detector that assists in determining how much weight has been placed on an object By observing the quantum of change in the resistance values of weight-seeking resistors, it is possible to calculate the applied weight. A weight-seeing resistor's operation is based on the "Contact Resistance" feature. Conducive polymer films are used in weight-seeking resistors, which change resistance in a predictable way when weight is placed on their faces. This film is made up of a matrix of sub-micrometer sized electrically conducting and non-conducting patches. This film's resistance changes when weight is applied to its face because the micronized flyspeck makes contact with the detector electrodes. The amount of change that the resistance values undergo determines how much weight is being applied.

4.2 RFID TAG AND READER

An RFID anthology is a device that gathers information from an RFID label, which is used to track particular products. Radio frequency swells are used to transmit data from the label to anthology. An RFID label needs to be close enough to an RFID anthology to be read. RFID technology makes it possible to quickly examine a variety of details and quickly identify a certain product, even when it is surrounded by numerous other details.

4.3LCD

It was designed specifically for E-blocks to use this TV. It is connected to a 16 character, 2-line alphanumeric TV display via a single 9-way D-type connector. As a result, the device can now connect to all E-Block I/O anchorages. The stoner companion below gives information on the periodic data format needed by the TV display.A 5V power source is also necessary for the display. Please be careful not to exceed 5V as this will damage your gadget. The E-blocks Multi programmer or a 5V fixed regulated power force elegantly generates the 5V.

4.4 MICROCONTROLLER

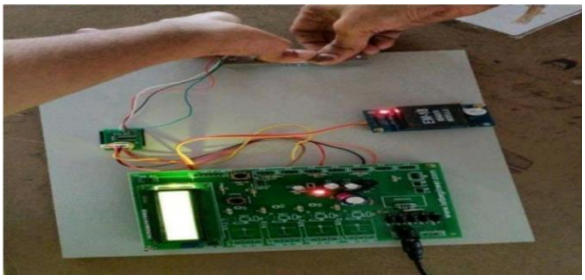
Espressif Systems, the organisation that created the infamous ESP8266 SoC, is the manufacturer of the ESP32 System on Chip (SoC) Microcontroller. A power amplifier, low-noise admit amplifier, antenna

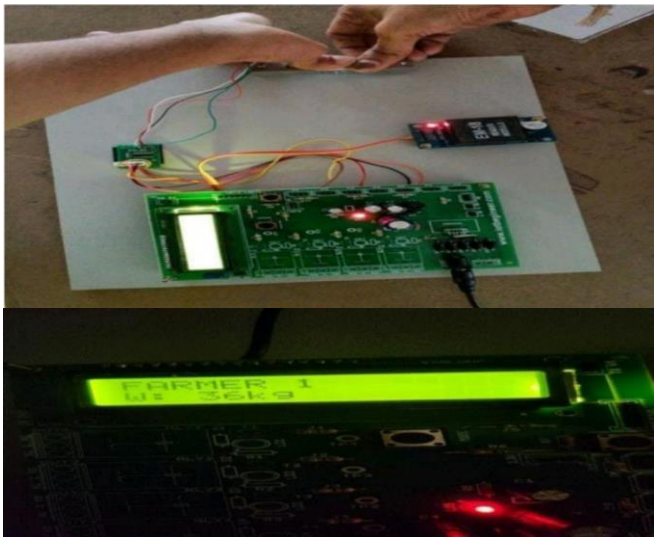
switch, pollutants, and RF balun are among the integrated RF components found in the ESP32, much like in the ESP8266. With so many outside influences, this makes creating a solution for the ESP32 pretty simple.

5.RESULT

With the aid of an RFID reader, a weight sensor, a microcontroller, an LCD, etc., as well as software like embedded C and the Arduino IDE, we developed a special piece of artificial intelligence-enabled agricultural, food, and public robotic tracker for the loading and unloading of food grains during mechanised distribution. We have put the code into place, and IOT will be used to update the database with the results from the weight sensor and RFID reader.

5.1 Output Images





6. CONCLUSION

In our paper, we offered a general framework and methodology for leveraging block chain and smart technologies to manage, monitor, and perform commercial operations, doing away with middlemen and the critical stage of processing required for agricultural supply chain crop price traceability. Thanks to this idea, any crop in the agricultural supply chain can now have distributed traceability and reliability. We also want to include delivery evidence and automatic payments as parts of our suggested solution, allowing for efficient and centralised party payment.

Future Scope:

1) The quality of a farmer's produce can be determined by scanning the QR code on it.
2) Using the same idea, we can later develop real-time applications for farmers.
3) For security purposes, Hyper Ledger allows us to upgrade block chain projects..

7. REFERENCES

1. M. M. Aung and Y. S. Chang, ``Traceability in a foodsupply chain: Safety and quality perspectives," Food Control,vol. 39, pp. 172_184, May 2014.
2. T. Bosona and G. Gebresenbet, ``Food traceability as anintegral part of logistics management in food and agriculturalsupply chain," Food Control, vol. 33, no. 2, pp. 32_48, 2013.
3. J. Hobbs, ``Liability and traceability in agri-food supplychains," in Quan- tifying the Agri-Food Supply Chain.Springer, 2006, pp. 87_102.
4. D. Mao, Z. Hao, F. Wang, and H. Li, ``Novel automaticfood trading system using consortium blockchain," Arabian J.Sci. Eng., vol. 44, no. 4, pp. 3439_3455, Apr. 2018.
5. L. U. Opara and F. Mazaud, ``Food traceability from _eldto plate," Outlook Agricult., vol. 30, no. 2, pp. 239_247, 2001.
6. Li, Q., Wang, M., Gu, W.: Computer Vision BasedSystemfor Apple Surface Defect Detection. Computers andElectronics in Agriculture 36, page 215-223.
7. Kim, M.S., Lefcourt, A.M., Chen, Y.R., Tao, Y.:Automated Detection of Fecal Contamination of Apples Based on Multispectral Fluorescence Image Fusion. Journal of food engineering 71, page 85-91.