ARTIFICIAL INTELLIGENT ENABLED AGRICULTURE, FOOD AND PUBLIC ROBOTIC TRACKER FOR MECHANISED DISTRUBTION LOADING / UNLOADING OF FOOD GRAIN

OBJECTIVE

To develop a system for buying and selling agricultural products without any middlemen

INTRODUCTION

We all know farmers are the backbones of our nation's economy as the Indian economy is primarily agriculture based. But it is hard to say that Indian farmers still face many difficulties about the price of farm produce, over ripening of products due to uncertain weather, diseases of crops, lack of agri-services, and technology. But people don't consider their issues. So we understand the significance of solving their problems thereby attracting many people and youth coming to this industry. Also, harmful chemicals applied in the agricultural industry which will cause deadly diseases should be prevented. It provides a secure way of storing and managing data, which facilitates the development and use of data-driven innovations for a secure supply chain. This system benefits farmers' access to markets and generate new revenue streams.

ABSTRACT

One of the major challenges the agriculture sector is facing today is middlemen fraudulence. These days the process depends on a third party to coordinate the delivery. The sellers usually have an agent who ensures that the goods are delivered safely and buyers have an agent to recommend payment and audit the delivery. The involvement of multiple agents adds high costs to the system and makes the entire process time-consuming and vulnerable. In the end, the farmers are left with minimal income, and users may not get quality products. The idea is to develop a portal for buying and selling agricultural products using IOT technology. Using web portal, the farmers can use this portal to sell their products in a more transparent manner. In this system, it is impossible for middlemen to tamper with the product details. This system ensures security through the decentralized structure it provides and thereby reduces the middlemen fraudulence

EXISTING SYSTEM

In existing system there is no tracking of food grains. In this system easily middlemen to buy food grains from farmer and sell to government with additional charges. It will leads to increase the price of food grains. And also farmer has losses.

LITERATURE REVIEW

BLOCKCHAIN-BASED AGRI-FOOD SUPPLY CHAIN: A COMPLETE SOLUTION

Abstract: Supply chains are evolving into automated and highly complex networks and are becoming an important source of potential benefits in the modern world. At the same time, consumers are now more interested in food product quality. However, it is challenging to track the provenance of data and maintain its traceability throughout the supply chain network. The traditional supply chains are centralized and they depend on a third party for trading. These centralized systems lack transparency, accountability and auditability. In our proposed solution, we have presented a complete solution for blockchain-based Agriculture and Food (Agri-Food) supply chain. It leverages the key features of blockchain and smart contracts, deployed over ethereum blockchain network. Although blockchain provides immutability of data and records in the network, it still fails to solve some major problems in supply chain management like credibility of the involved entities, accountability of the trading process and traceability of the products. Therefore, there is a need of a reliable system that ensures traceability, trust and delivery mechanism in Agri-Food supply chain. In the proposed system, all transactions are written to blockchain which ultimately uploads the data to Interplanetary File Storage System (IPFS). The storage system returns a hash of the data which is stored on blockchain and ensures efficient, secure and reliable solution. Our system provides smart contracts along with their algorithms to show interaction of entities in the system. Furthermore, simulations and evaluation of smart contracts along with the security and vulnerability analyses are also presented in this work.

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BLOCKCHAIN-BASED TRACEABILITY IN AGRI-FOOD SUPPLY CHAIN MANAGEMENT: A PRACTICAL IMPLEMENTATION

Abstract—The recent, exponential rise in adoption of the most disparate Internet of Things (IoT) devices and technologies has reached also Agriculture and Food (Agri-Food) supply chains, drumming up substantial research and innovation interest towards developing reliable, auditable and transparent traceability systems. Current IoT-based traceability and provenance systems for Agri-Food supply chains are built on top of centralized infrastructures and this leaves room for unsolved issues and major concerns, including data integrity, tampering and single points of failure. Blockchains, the distributed ledger technology underpinning cryptocurrencies such as Bitcoin, represent a new and innovative technological approach to realizing decentralized trustless systems. Indeed, the inherent properties of this digital technology provide fault-tolerance, immutability, transparency and full traceability of the stored transaction records, as well as coherent digital representations of physical assets and autonomous transaction executions. This paper presents AgriBlockIoT, a fully decentralized, blockchain-based traceability solution for Agri-Food supply chain management, able to seamless integrate IoT devices producing and consuming digital data along the chain. To effectively assess AgriBlockIoT, first, we defined a classical use-case within the given vertical domain, namely from-farm-to-fork. Then, we developed and deployed such use-case, achieving traceability using two different blockchain implementations, namely Ethereum and Hyperledger Sawtooth. Finally, we evaluated and compared the performance of both the deployments, in terms of latency, CPU, and network usage, also highlighting their main pros and cons.

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A THEORETICAL IMPLEMENTATION: AGRICULTUREFOOD SUPPLY CHAIN MANAGEMENT USING BLOCKCHAIN TECHNOLOGY

Abstract - The traceability of Agriculture food supply chain management is important to ensure the food safety. It also increases the customer satisfaction and peer-topeer productivity. The centralized data storage makes it more difficult to assure quality, rate and origin of the products. So we are in need of a decentralized system where transparency is available which makes people from the producers to consumers satisfaction. Blockchain technology, which is a digital technology that allows us to acquire traceability and transparency in the supply chain. Making use of this technology actually improves the community between different stakeholders and farmers. The properties of blockchain essentially provides increased capacity, better security, immutability, minting, faster settlement and full traceability of stored transactions records. This paper presents a fully decentralized blockchain based traceability that enables to build blocks for agriculture that continuously integrate with IoT devices from provider to consumer. To implement, we introduced “Provider-Consumer Network” - a theoretical end to end food traceability application. The objective is to create distributed ledger that is accessible by all users in the network that in turn brings transparency.
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ANALYSIS OF AGRICULTURAL SUPPLY CHAIN MANAGEMENT FOR TRACEABILITY OF FOOD PRODUCTS USING BLOCKCHAIN-ETHEREUM TECHNOLOGY

Abstract : The current agricultural supply chain is a centralized system that has many issues related to integrity, tracking, organizing the transactions. There is lack of trust and transparency in the supply chain. There are many irregularities in the implementation of schemes. The consumers doubt the quality of the food supplied to them. The farmers, wholesalers are affected from the payment frauds by the middlemen. Blockchain helps us solve these issues by keeping track of all the different stages of food. The public blockchain being transparent, open, immutable, trackable helps in reducing the irregularities, frauds. This paper proposes the agricultural supply chain system model that uses the Ethereum platform. The smart contracts are developed for different stages of the supply chain. These contracts ensure that all the pre-decided conditions are satisfied before proceeding with the transactions. This system ensures security, reliability, trust, openness. It eases the transactions, administrative processes. It gives a fair chance to farmers to quote a price using smart contracts.

AUTHOR: Pooja S, Meeradevi, Monica R Mundada

BLOCKCHAIN BASED SMART MODEL FOR AGRICULTURAL FOOD SUPPLY CHAIN

Abstract—Ensuring food safety requires to fully monitor the overall process of handling food, preparation as well as storage of food in such a way that it reduces the risk of people getting sick due to undue cleanliness or any mismanagement in the overall process. Smart agricultural includes an efficient, clean and safe food supply chain system that can tackle these issues more smartly than that of existing system. Agricultural food supply chain denotes the mechanism explaining how the farm food comes to our tables. The research presents a smart model for the transformation of traditional food supply chain considering Blockchain Technology. The model promises to give all stakeholders participating in the agricultural food supply chain equal opportunities even if they are not familiar to each other but without the help of trustworthy third party service provider. We validate proposed blockchain based smart model with our own scheme without using blockchain. Index Terms—Foodborne, Smart Mode , Blockchain, Scheme.

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PROPOSED SYSTEM

- In proposed system provides a direct selling from farmer to government. This system contains a microcontroller, RFID reader and weight sensor. The RFID tags in every food grain bags, when farmer enter the selling place to their products, the government officers fetch the details of the farmers using RFID reader. And also the details of farmer updated in IOT webpage also. The weight sensor used to measure the weight of the food grains. Every farmer has unique RFID tags so identify the farmer is easy and also the details are updated in web page so the intermediates are avoided.
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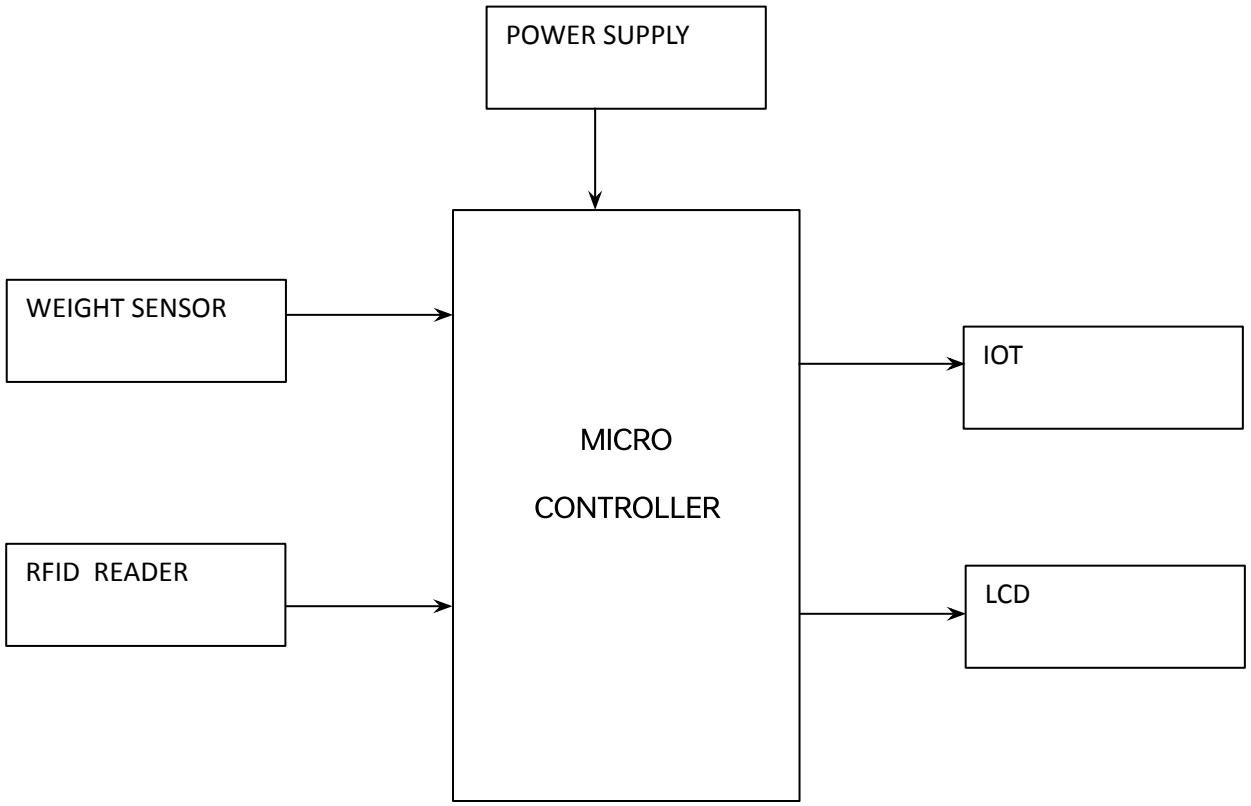
BLOCK DIAGRAM:



HARDWARE DESCRIPTIONS

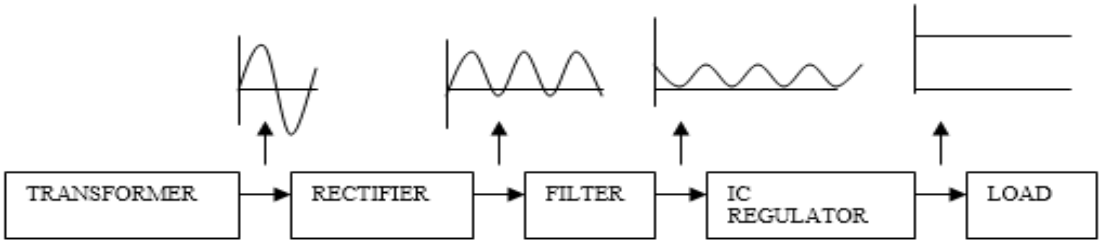
- POWER SUPPLY
- RFID READER AND TAGS
- MICROCONTROLLER
- WEIGHT SENSOR

SOFTWARE DESCRIPTIONS

- ARDUINO IDE
- EMBEDDED C

HARDWARE DESCRIPTIONS

POWER SUPPLY



- Step-down transformer is used to covert the 230v ac into 12v ac.
- Rectifier will convert 12v ac into 12v dc.
- Filter is used to reduce harmonic signal.
- Regulator is used for 12v dc into 5v dc by ic7805. Because the microcontroller will run only in 5v.

ESP32 MODULE

Description

ESP32 is a series of low-cost, low-power system on a chip microcontrollers with integrated Wi-Fi and dual-mode Bluetooth. The ESP32 series employs either a Tensilica Xtensa LX6 microprocessor in both dual-core and single-core variations, Xtensa LX7 dual-core microprocessor or a single-core RISC-V microprocessor and includes built-in antenna switches, RF balun, power amplifier, low-noise receive amplifier, filters, and power-management modules. ESP32 is created and developed by Espressif Systems, a Shanghai-based Chinese company, and is manufactured by TSMC using their 40 nm process. It is a successor to the ESP8266 microcontroller.

SPECIFICATIONS OF ESP32 BOARD:

- Xtensa dual-core (or single-core) 32-bit

LX6 microprocessor, running at 160 or 240 MHz

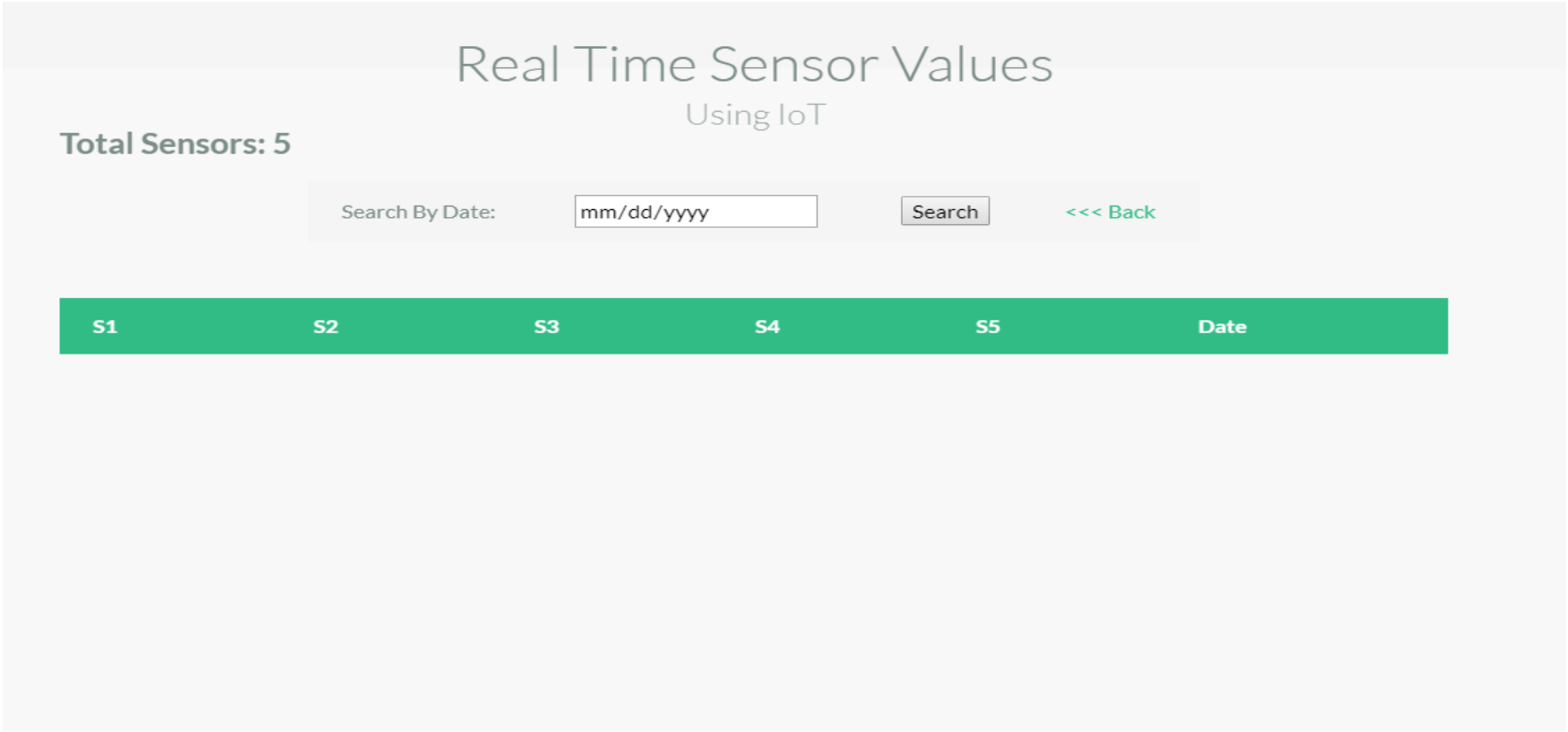
- Memory: 520 KB SRAM
- Wi-Fi: 802.11 b/g/n
- Bluetooth: v4.2 BR/EDR and BLE
- 12-bit × 18 ADC channels
- 2 × 8-bit DACs
- 10 × touch sensors (capacitive sensing GPIOs)
- channels)
- 4 × SPI
- 2 × I^2S interfaces
- 2 × I^2C interfaces
- 3 × UART
- SD/SDIO/CE-ATA/MMC/eMMC host controller
- SDIO/SPI slave controller
- CAN bus 2.0
- Infrared remote controller (TX/RX, up to 8 channels)
- Motor PWM
- LED PWM (up to 16

ESP32 Module

IOT

- The Internet of things (IoT) is the network of everyday objects — physical things embedded with electronics, software, sensors, and connectivity enabling data exchange.
- Basically, a little networked computer is attached to a thing, allowing information exchange to and from that thing.
- Be it lightbulbs, toasters, refrigerators, flower pots, watches, fans, planes, trains, automobiles, or anything else around you, a little networked computer can be combined with it to accept input (especially object control) or to gather and generate informational output (typically object status or other sensory data).
- This means computers will be permeating everything around us — ubiquitous embedded computing devices, uniquely identifiable, interconnected across the Internet.
- Because of low-cost, networkable microcontroller modules, the Internet of things is really starting to take off.

WEB SERVER


Real Time Sensor Values
Using IoT
Total Sensors: 5
Search By Date:
mm/dd/yyyy
Search
<<< Back
S1
S2
S3
S4
S5
Date

LCD

This is an LCD Display designed for E-blocks. It is a 16 character, 2-line alphanumeric LCD display connected to a single 9-way D-type connector. This allows the device to be connected to most E-Block I/O ports. The LCD display requires data in a serial format, which is detailed in the user guide below. The display also requires a 5V power supply. Please take care not to exceed 5V, as this will cause damage to the device. The 5V is best generated from the E-blocks Multipogrammer or a 5V fixed regulated power supply.

FEATURES

- Input voltage: 5v
- E-blocks compatible
- Low cost
- Compatible with most I/O ports in the E-Block range
- Ease to develop programming code using Flow code icor

APPLICATIONS

- Monitoring.

RFID READER WITH TAG

- A **Radio Frequency Identification Reader (RFID reader)** is a device used to gather information from an RFID tag, which is used to track individual objects. Radio Frequency waves are used to transfer data from the tag to a reader. The RFID tag it must be within the range of an RFID reader, in order to be read. RFID technology allows several items to be quickly scanned and enables fast identification of a particular product, even when it is surrounded by several other items.

FEATURES

- Supply voltage: 12v DC
- Output: UART RS232
- TTL UART also provided
- In-built buzzer indicator
- Signal LED is placed

APPLICATIONS

- Passports
- Toll booth passes
- Hospitals
- Libraries

WEIGHT SENSOR

A weight Sensor is defined as a transducer that converts an input mechanical load, weight, tension, compression or pressure into an electrical output signal (load cell definition). weight Sensors are also commonly known as force Transducer. A weight Sensor is a sensor that helps in measuring the amount of weight applied to an object. By observing the amount of change in the resistance values of weight-sensing resistors, the applied weight can be calculated. The working principle of a weight-sensing resistor is based on the property of 'Contact Resistance'. weight-sensing resistors contain a conductive polymer film that changes its resistance in a predictable manner when weight is applied on its surface. This film consists of, sub-micrometres sized, electrically conducting and non-conducting particles arranged in a matrix. When weight is applied to the surface of this film, the micronized particle touches the sensor electrodes, changing the resistance of the film. The amount of change caused to the resistance values gives the measure of the amount of weight applied.

FEATURES

- Size range: Max-20″x24″ Min-0.2″′x0.2″.
- Device thickness: 0.008″ to 0.50″.
- weight sensitivity range 100g to 10
- 10kgTemperature range: -30C to +7C

APPLICATIONS

- Robotics
- Load and compression sensing
- Weighting
- Contact sensing

SOFTWARE DESCRIPTIONS

ARDUINO IDE

Arduino is an open-source electronics platform based on easy-to-use hardware and **software**. **Arduino** boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online.

EMBEDDED C

- Embedded C is designed to bridge the performance mismatch between Standard C and the embedded hardware and application architecture.
- It extends the C language with the primitives that are needed by signal-processing applications and that are commonly provided by DSP processors.
- The design of the support for fixed-point data types and named address spaces in Embedded C is based on DSP-C. DSP-C [1] is an industry-designed extension of C with which experience was gained since 1998 by various DSP manufacturers in their compilers.

- For the development of DSP-C by ACE (the company three of us work for), cooperation was sought with embedded-application designers and DSP manufacturers.

- The Embedded C specification extends the C language to support freestanding embedded processors in exploiting the multiple address space functionality, user-defined named address spaces, and direct access to processor and I/O registers.
- These features are common for the small, embedded processors used in most consumer products.
- The features introduced by Embedded C are fixed-point and saturated arithmetic, segmented memory spaces, and hardware I/O addressing.
- The description we present here addresses the extensions from a language-design perspective, as opposed to the programmer or processor architecture perspective.

CONCLUSION

The proposed system which provides a transparent system to reduce the middleman fraudulence which is prevalent today and also help farmers to sell their product at a better profit.

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