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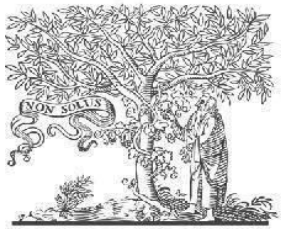

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IOT BASED RATIONING SYSTEM IN FCI

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ABSTRACT:

In developing countries like India, the poor people meet their fundamental needs through subsidy provided by the government for basic domestic commodities. This current system also requires transaction record maintenance. Numerous difficulties are met through this prevailing system. Some of the major issues are ration distribution to unauthorized card holders, involving in the transgressions and human interference in transaction updating and ledger maintain process. In order to overcome such issues, Internet of Things based smart card system is proposed in which automatically dispenses the basic commodities to genuine card holders after verifying the card holder details.

1. INTRODUCTION :

PDS (Public Distribution System) is also called as ratio distribution system, which is one of the commonly disputable issues which are involved in malpractices. Public Distribution System of India facilitates supply of rice, ragi, wheat, cooking oil to the Below Poverty Line (BPL)periodically on a monthly basis. Smart Ration Card is a- replacement of the normal ration card, which is normally used to supply food grains and other provisions by the Government at a subsidised cost to a specific class of people-in the society.

The objective of the project is to automate the task of distribution of items efficiently. The project is aimed to stop corruption and discrepancies created in distribution shops. Herethe system must perform the following: Validate the Smart Ration Card of the beneficiaries; Avoiding irregularities in distribution of grains; SMS notification of the beneficiaries; Stock maintenance in the distribution centre.

The key purpose of this scheme is to device a fingerprint matching algorithm for confirmation of user details and to atomize the delivery of the products to the people. In addition to it based onthe quantity selected and received by the people, automatic updating process is carried over in Government database. Internet of Things (IoT), means numerous amounts of physical devices connected via internet, which are capable of gathering and sharing the data.

This ensures transparency and efficiency in the distribution system, reducing manual errors. The integration of IoT provides real-time tracking and monitoring, enhancing the overall process. It also ensures resources reach the rightbeneficiarie.

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2. BLOCK DIAGRAM :

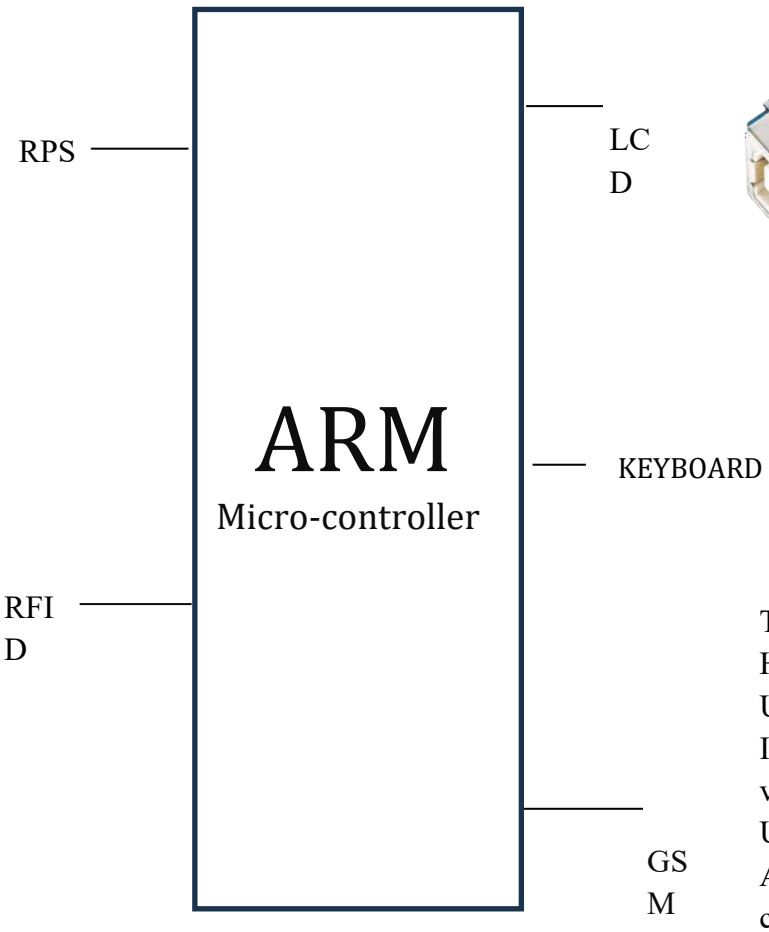


Fig.2 Block diagram

2.1 ARDUINO UNO :

Fig.2.1 Arduino UNO

The Arduino UNO is a standard board of Arduino. Here UNO means 'one' in Italian. It was named as UNO to label the first release of Arduino Software. It is considered as the powerful board used in various projects. Arduino.cc developed the Arduino UNO board. Arduino UNO is based on ATmega328P micro controller. It is easy to use compared to other boards, such as the Arduino Mega board, etc. The board consists of digital and analog Input/Output pins(I/O), shields, and other circuits.

The Arduino UNO includes 6 analog pin inputs, 14 digital pins, a USB connector, a power jack, and an ICSP (In-Circuit Serial Programming) header. It is programmed based on IDE, which stands for Integrated Development Environment.

2.2 RFID :

Radio-frequency identification (**RFID**) uses electric field to automatically called a tag a radio receiver and a transmitter.

Fig.2.2 RFID

An RFID reader is a radio frequency device that emits a signal through an antenna.

An RFID tag is a small device that uses radio frequency signals to wirelessly transmit data for identification and trackingpurposes.

2.3 LCD DISPLAY:

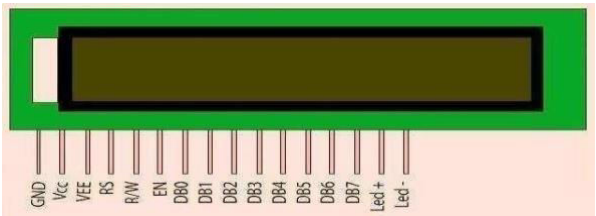


Fig.2.3 LCD display

The board which we used is shipped with 16*2 character LCD display. LCD is used to display message access granted and access denied. In LCD has16 characters per line by 2 lines and 20 characters per line by 2 lines, respectively.

When lockers will be open and close. LCD display is used for the displaying the message orto open and close the door and also display the enter the password etc.

2.4 KEYPAD:

Fig.2.4 Keypad

The Keypad modules are made of thin, flexible membrane material. The 4 x4 keypad module consists of 16 keys, these Keys are organized ina matrix of rows and columns. All these switches are connected o each other with a conductive trace. Normally there is no connection between rows and columns. When we will press a key, then a row and a column make contact.

To detecting a pressed key, the microcontroller grounds all rows by providing 0 to the output pins, and then it reads the columns. If the data read from columns is = 1111, it means no key has been pressed. When we will Pressing abutton

shorts one of the row lines to one of the column lines, allowing current to flow between them. For example, when key 'Button 1' is pressed column 1 and row 1 are shorted. If the column 1 and row 1 are shorted. If the first column bit value is a zero, this means that the button1 key was pressed.

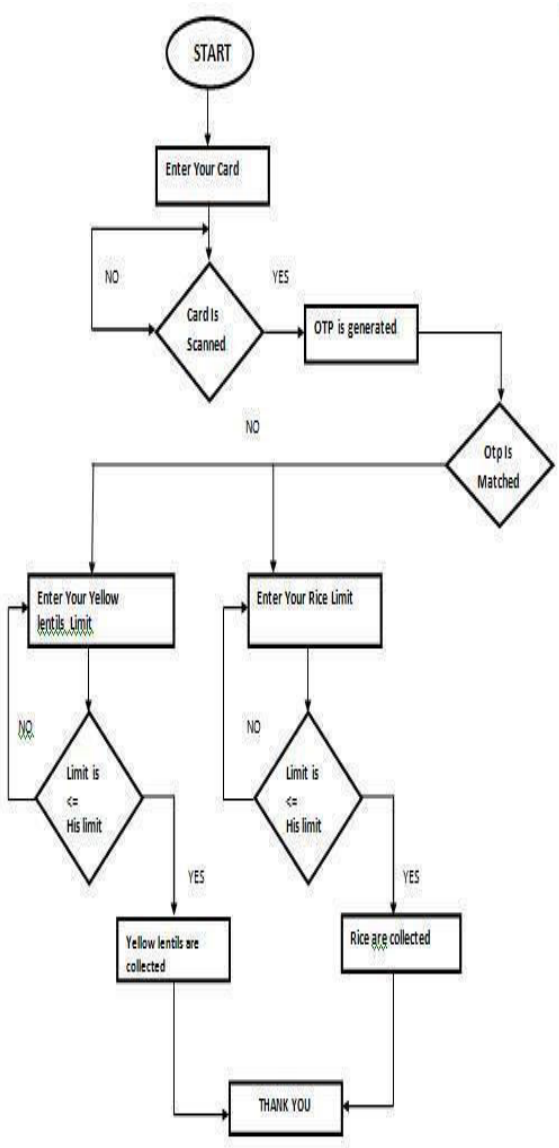
3. WORKING :

The system initiates its operation by activating the power supply. This step serves as the foundation for subsequent actions.The system initiates its operation by activating the power supply. This step serves as the foundation for subsequentactions.

An IoT-based rationing system integrates various components such as RPS (Regulated Power Supply), RFID, GSM, LCD, and a Keyboard to ensure efficient and transparent distribution of ration supplies. The system begins with the beneficiary authenticating their identity using an RFID card, which contains unique user details linked to a central database. Upon successful authentication, the beneficiary uses the keyboard to input the desired quantity of ration within their allotted quota. This information is displayed on the LCD screen, showing details such as the available balance, requested quantity, and cost, allowing the user to confirm the transaction.

Once confirmed, the system dispenses the exact amount of ration using an automated dispensing mechanism, eliminating manual intervention. The GSM module sends a transaction confirmation SMS to the beneficiary's registered mobile number and updates the central database with real-time transaction data, ensuring transparency. The RPS (Regulated Power Supply) provides stable power to the entire system, ensuring smooth operation even in areas with inconsistent electricity. This integrated system enhances efficiency, reduces errors, prevents fraud, and promotes transparency in ration distribution

4. DESIGN FLOW:



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5. RESULT

The implementation of a ubiquitous IoT- based rationing system for public distribution systems has been carried out effectively.

The IoT-based rationing system in FCI improves real-time monitoring, reduces wastage, and enhances distribution efficiency. It ensures better resource allocation, prevents fraud, and provides cost savings. Automation and data analytics increase transparency, accountability, and streamline the entire ration distribution process for improved service delivery.

This system represents a significant advancement in ensuring equitable access to resources, minimizing leakages, and providing a user- friendly, efficient framework for managing public distribution systems.

Fig.5 Result

6. CONCLUSION:

In developing countries like India, the poor people IoT based Smart Ration Card system is an automated scheme, which uses fingerprint validation process. In order to provide security and accuracy to this scheme, Minutiae extraction-based algorithm is used in fingerprint validation process. This process eradicates forged ration card users and prevents them from participating in any further transgression. Picking the goods and quantity by the means of android application, the system becomes smarter and robust. By means of implementing this system, one can evade the misconducts since there is no manual process involved in it and the system also stores all details in a database.

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