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Smart Ration Distribution System Using RFID or Biometric

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Abstract: ***Smart Ration Distribution System is one of the widely controversial issues that involve malpractice. The manual intervention in weighing of the materials leads to inaccurate measurements and/or it may happen, the ration shop owner illegally uses consumer materials without prior knowledge of ration card holders.***
The proposed system aids to control malpractices which are present in ration shops by replacing manual work with automatic systems based on RFID or biometric. Every consumer i.e., family head provided RFID card which acts as ration card. The RFID card has a unique identification number.
The consumer scans the card on an RFID reader which is interfaced with a microcontroller kept at a ration shop or has to scan his finger at the fingerprint scanner to get his identity or details. Once the consumer is validated by details, the system automatically activates appropriate circuitry and the consumer gets material by weighing on the load cell and confirmation will be given by pressing a small push button. The same information will be transmitted to the head of family member mobile number.

I. INTRODUCTION

Smart Ration Distribution system replaces the manual work in ration shops. RFID means Radio Frequency Identification technique and biometric fingerprint scanner are used to prevent the ration forgery. Nowadays this process is online which comes as a blessing for the applicants who hate standing for a long time in queues for filling the application form and then go to the office again to know the status.

In this each user will be having RFID based ration cards, these cards will have unique numbers. Each user will also have fingerprints of their family members. Whenever a user wants to buy some groceries, he must show his RFID based ration card to the ration shopkeeper or user has to scan his fingerprint.

II. WORKING

The proposed system replaces the manual work in ration shops. Each ration shop contains an RFID reader which reads an RFID ration card, an RFID reader used to check whether a user is valid or not and a fingerprint scanner. The biometrics will be used in this system. It works for the identification of users. It stores fingerprints of users to the database. This new produced system will cover human efforts and also the fraud is detected in that system.

Whenever a user wants to buy some groceries, user must show his RFID based ration card to the shopkeeper or scan his fingerprint, then user must scan RFID Tag to RFID reader or user has to scan biometric. If the user authentication is verified it will move further, if not the tag or fingerprint is unauthorized.

The user's identity will be verified by microcontroller which connects data. LCD will display user details and the quantity of the item to be loaded, the weight of the item is added on load cell, load cell will load the item and sends information to microcontroller, then microcontroller will send information to LCD to display, the process will complete only after taking the quantity which is displayed LCD.

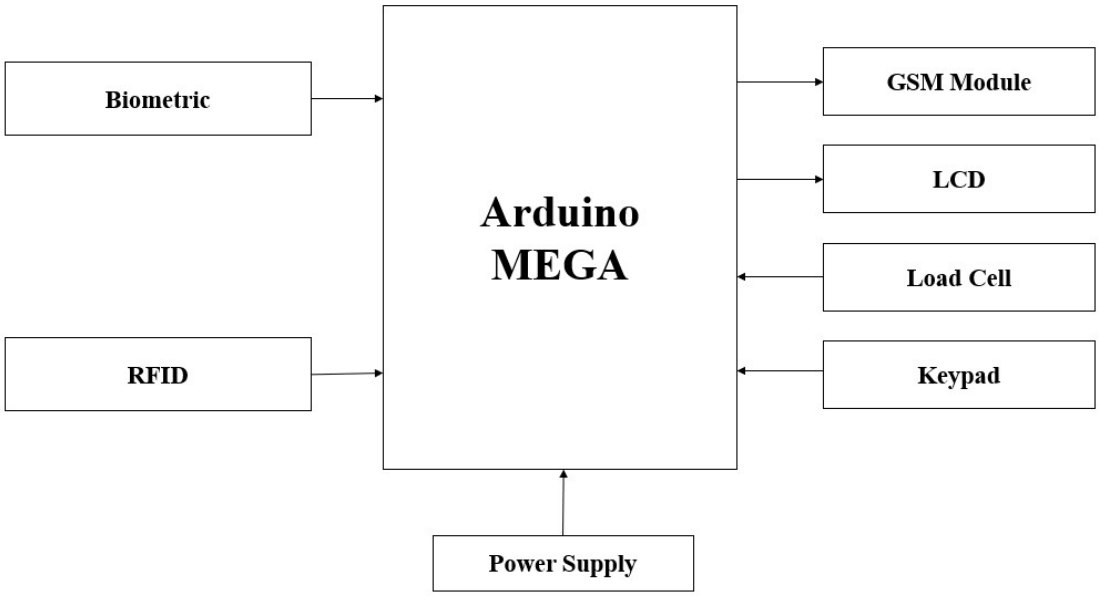
Message will go to the head of the family member through GSM. If the user tries take the ration again, it will display the like Person name for Family number has taken.

If any unauthorized persons or the same person try to take ration again, it will check the authentication and the controller automatically alerts by displaying in the LCD interfaced to the controller.

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III. BLOCK DIAGRAM



IV. MODULES OF THE PROJECT

A. Biometric

Biometrics scanners are hardware used to capture the biometric for verification of identity. These scans match against the saved database to approve or deny access to the system. In other words, biometric security means your body becomes the “key” to unlock your access.



B. RFID

Radio Frequency Identification (RFID) refers to a wireless system comprised of two components: tags and readers. The reader is a device that has one or more antennas that emit radio waves and receive signals back from the RFID tag. Tags, which use radio waves to communicate their identity and other information to nearby readers, can be passive or active. Passive RFID tags are powered by the reader and do not have a battery. Active RFID tags are powered by batteries.



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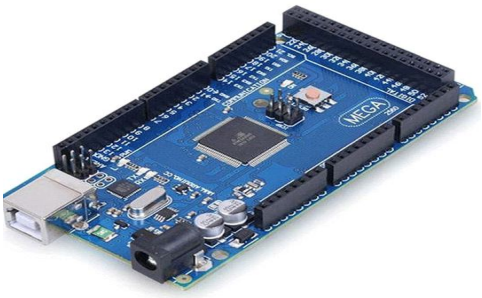
C. GSM Module

User receives SMS indication with the help of GSM modem connected to the Arduino Uno board. This is detected by the Microcontroller (Arduino) and gives direction to make a call using GSM Module and to turn off the power supply using by power control unit.



D. Arduino MEGA

The Arduino Mega is a microcontroller board based on the ATmega2560. It has 54 digital input/output pins (of which 15 can be used as PWM outputs), 16 analog inputs, 4 UARTs (hardware serial ports), a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. In this proposed system we are using 18 digital pins, 2 analog pins , ground , 5v.



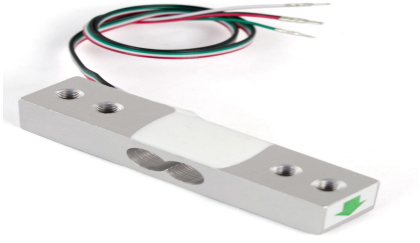
E. LCD

LCD (Liquid Crystal Display) is a type of flat panel display which uses liquid crystals in its primary form of operation. LEDs have a large and varying set of use cases for consumers and businesses, as they can be commonly found in smartphones, televisions, computer monitors and instrument panels.



F. Load Cell

A load cell is a force transducer. It converts a force such as tension, compression, pressure, or torque into an electrical signal that can be measured and standardized. As the force applied to the load cell increases, the electrical signal changes proportionally.

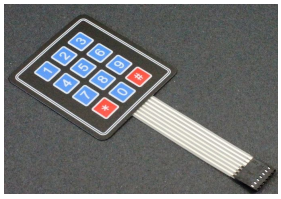


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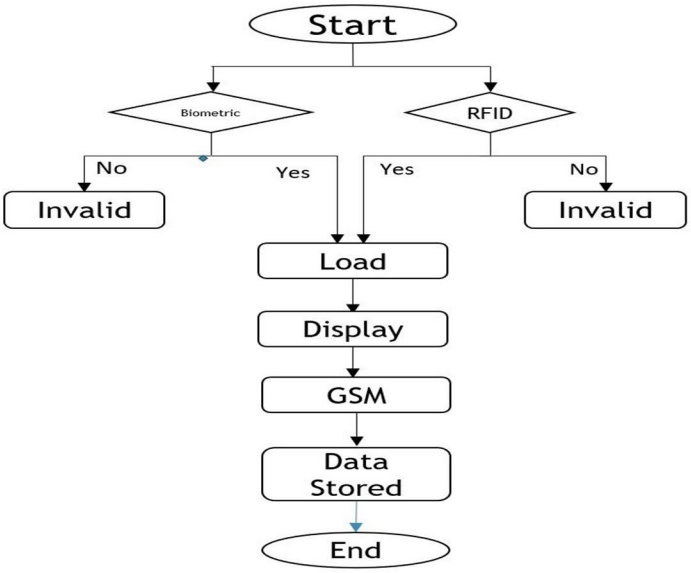
G. Keypad

Keypad is an analog switching device which is generally available in matrix structure. It is used in many embedded system application for allowing the user to perform a necessary task.

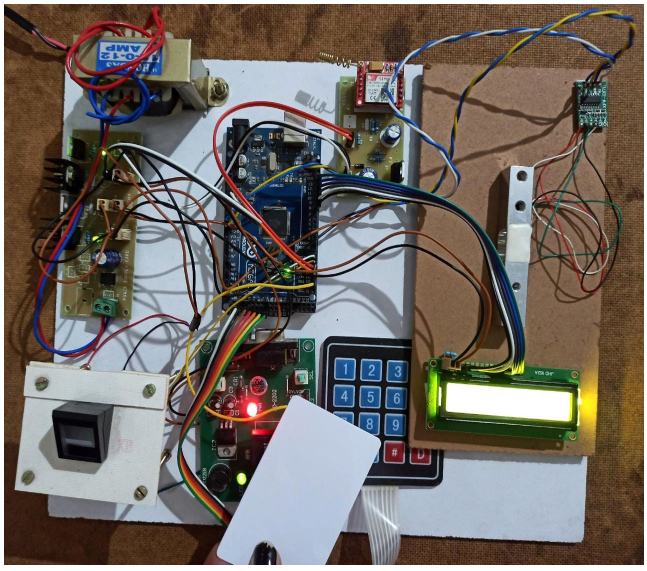
A matrix keypad is consists of an arrangement of switches connected in matrix format in rows and columns.



V. FLOWCHART

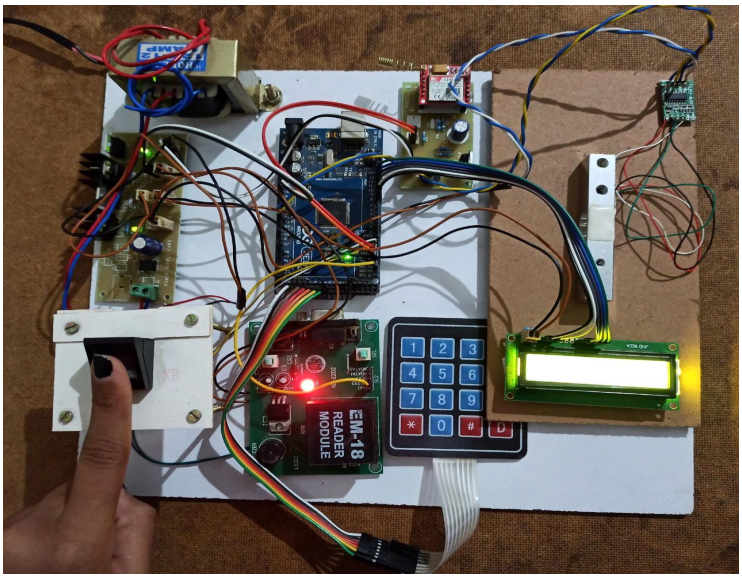


VI. RESULTS



Input through RFID

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Input through Biometric

VII. CONCLUSION

The increased need for privacy and security in our daily life has given birth to this new area of science. These devices are here and are present around us everywhere in the society and are here to stay for a long time to come. Indeed, it will be interesting to watch the future impact that they will have on our day-to-day lives.

The project work "Smart ration distribution system using RFID or Biometric" is designed and developed successfully. For the demonstration purpose, a prototype module is constructed; and the results are found to be satisfactory. Since it is a prototype module, a simple module is constructed, which can be used for many applications like highly confidential areas or where highlevel security is required.

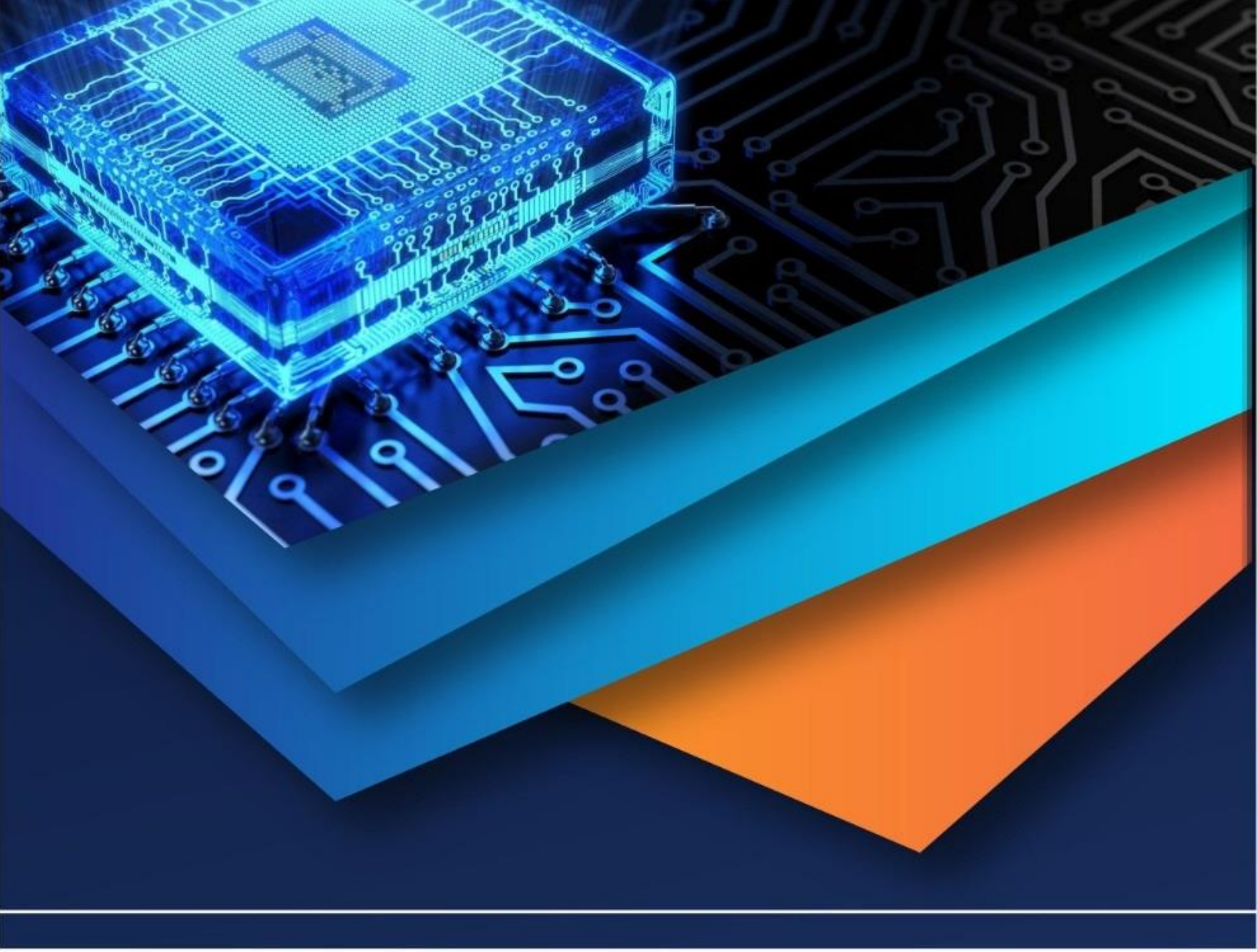
VIII. ACKNOWLEDGEMENT

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