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IOT And RFID Based Rationing System

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Abstract. *The Public Distribution System (PDS) in India is responsible for providing rations to impoverished families. However, the current system has several significant shortcomings, including inadequate food grain storage, manual and inconsistent record-keeping practices, instances of black-market activities, and poor maintenance. To address these issues, we propose implementing a smart ration card system that utilizes Radio Frequency Identification (RFID) technology and the Internet of Things (IoT). RFID is a reliable and efficient method of object identification, categorized under Automatic Identification and Data Capture technologies. Under this proposed system, the traditional ration card will be replaced by a unique RFID tag. At the fair price shop, the RFID tag will undergo verification to authenticate the user's identity. A microcontroller will handle the verification process, checking if the user is legitimate. If the user is verified, the system will display the monthly ration quota available to them. Upon a successful transaction, the database will be updated accordingly. This system minimizes the need for human intervention and ensures enhanced security. By implementing this advanced system, the government can easily monitor all distributed ration supplies. It eliminates the need for manual record-keeping, reduces the possibility of fraudulent activities, and offers efficient operation and enhanced security measures.*

1. INTRODUCTION

The Internet of Things (IoT) refers to the connectivity of physical objects that have embedded electronics, enabling them to communicate and interact with each other and the external environment. In the coming years, IoT-based technology will revolutionize daily life and provide advanced services. Various fields, such as medicine, power, gene therapies, agriculture, smart cities, and smart homes, have already embraced IoT. Currently, there are over 9 billion connected objects on the internet, and this number is expected to grow to 20 billion in the near future. In the consumer market, IoT technology is most commonly associated with smart home products like lighting fixtures, thermostats, security systems, cameras, and other appliances. These devices can be controlled through ecosystems such as smartphones and smart speakers. Furthermore, IoT has significant potential in healthcare systems. It encompasses a network of interconnected computing devices, mechanical and digital machines, objects, animals, or people that have unique identifiers and can transfer data without human-to-human or human-to-computer interaction.

2. BLOCK DIAGRAM

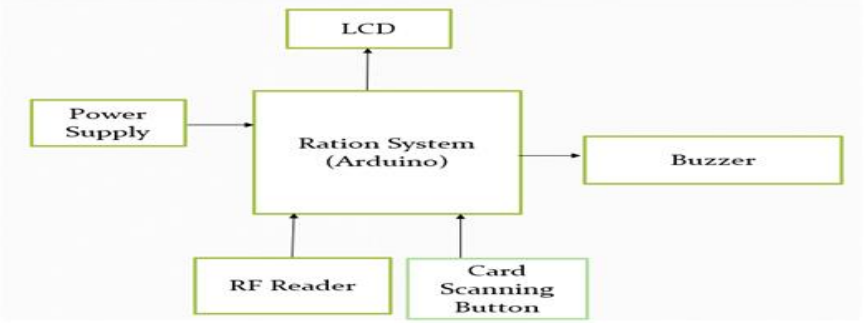


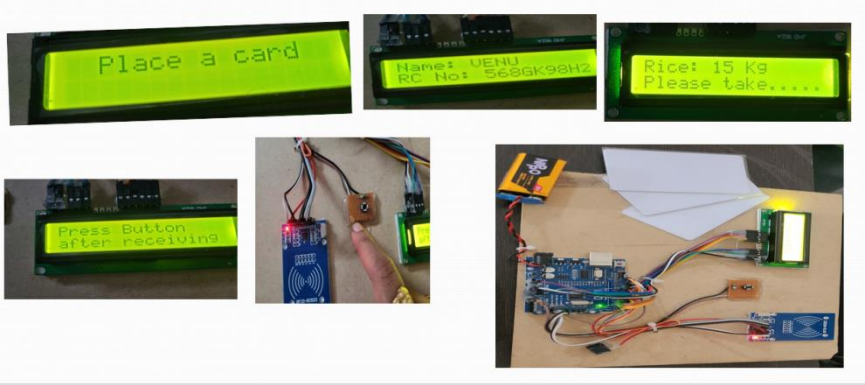
FIGURE 1. Electrical block diagram

To begin, connect a power supply to the Arduino board to activate the entire system. Once the power is supplied, the reader will transmit the stored information to the Arduino. The Arduino will then process this information and display the output on the LCD screen. In this setup, a button is utilized to initiate and complete the process, while a buzzer can be employed for additional functionality or alerts.

3. WORKING MODEL

Our working process involves swiping a tag over an RFID reader. The tag contains information that will be linked with a serial code. To establish this link, we input details such as the name and ration number. The RFID reader then sends the stored information to an Arduino device. If the information matches the data stored in the database and the consumer has not collected their ration, the Arduino displays the name, quantity, and ration number on an LCD screen. However, if the consumer has already collected their ration, we receive a statement indicating that the consumer has received it, accompanied by a buzzer sound. Additionally, the database is updated accordingly.

4. RESULT



The provided image depicts the project's output, which is presented on an LCD screen. When an RFID tag is placed on the RFID reader, the customer's name and ration card number are shown. Subsequently, the allocated quantity for the ration card holder is displayed, and the ration is dispensed accordingly.

5. CONCLUSION

The Public Distribution System (PDS) is an automated system that serves as an improvement over the existing fair price shops. Its primary objectives are to eliminate fraudulent ration card holders and safeguard the interests of the general public, thereby ensuring the nation's food security. Additionally, the system's efficiency is expected to reduce corruption levels. By allowing users to select commodities and quantities, the system becomes smarter and more robust, contributing to the country's economic growth. Implementing the automated PDS is relatively straightforward and requires less effort compared to alternative systems. This system also helps prevent malpractices since there are no manual operations, and all information is stored in a database. Consequently, it proves highly beneficial for the people. Moreover, since no manual data is stored in books or registers, all information is easily accessible in the database, facilitating cross-checking by higher authorities. Therefore, implementing this system would be of great assistance to the intended beneficiaries.

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