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Smart Ration Distribution using RFID and Biometric for Avoiding Malpractices

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Abstract: ***RFID card based Fingerprint scanning technology for identifying the genuine customers can be adapted to the existing ration distribution, by which fraud customers and dealers can be eliminated. India's Public Distribution System (PDS) is the largest retail system in the world. Public distribution system provides a ration card issued under an order or authority of the State Government for the purchase of essential consumer materials like rice, wheat, kerosene and oil. State Government issues distinctive ration cards like yellow ration card, saffron ration card, and white ration card depending on family annual income. The consumer material is supplied to ration card holders in the first week of every month by ration shopkeeper. Public 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 shop by replacing manual work with automatic system based on RFID. Every consumer i.e., family head provided RFID card which acts as ration card. The RFID card has unique identification number. The consumer scans the card on RFID reader which is interfaced with microcontroller kept at ration shop and has to scan his finger at the fingerprint scanner to get his identity or details. Once consumer is validated by details, the system automatically activates appropriate circuitry and consumer gets material through the output. The proposed RFID and biometric based automatic ration shop system would bring transparency in public distribution system and become helpful to prevent malpractices.***
Keyword: RFID, Fingerprint

I. INTRODUCTION

In urban areas, kerosene is supplied to ration card holders in the first week of every month and the ration shop keepers are taking keen steps to distribute kerosene to cardholders a minimum of three or four days a week. The Indian ration card is mainly used for purchasing capitalized food and fuel for example fuel.

It is an important livelihood tool for the poor people, providing proof of identity and a connection with government databases. The present ration distribution system has drawbacks like inaccurate quantity of goods, low processing speed, large waiting time, material theft in ration shop.

The proposed system replaces the manual work in ration shop. RFID means Radio Frequency Identification technique and biometric fingerprint scanner are used to prevent the ration forgery.

Now a day this process is online which comes as blessing for the applicants who hate standing for 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 card which contain user information including Bank details.

These cards will be having unique numbers.

Whenever user wants to buy some grocery he must show his RFID based ration card to shopkeeper and scan his fingerprint. Each ration shop contain RFID reader which reads RFID ration card, RFID reader used to check user valid or not and fingerprint scanner. The biometrics will be used in this system.

It works for an identification of user. It stores fingerprints of users to database. This new produced system will cover the human efforts and also the fraud is detected in that system and the forgery is also removed.

In this proposed system, we briefly discuss the existing works about Public Distribution System. In this automated system conventional ration card is replaced by RFID (smart card) in which all the details about users are provided including their bank details which is used for user authentication.

This proposed to use smart card instead of manual ration card with Biometrics for unique authentication.

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II. BLOCK DIAGRAM

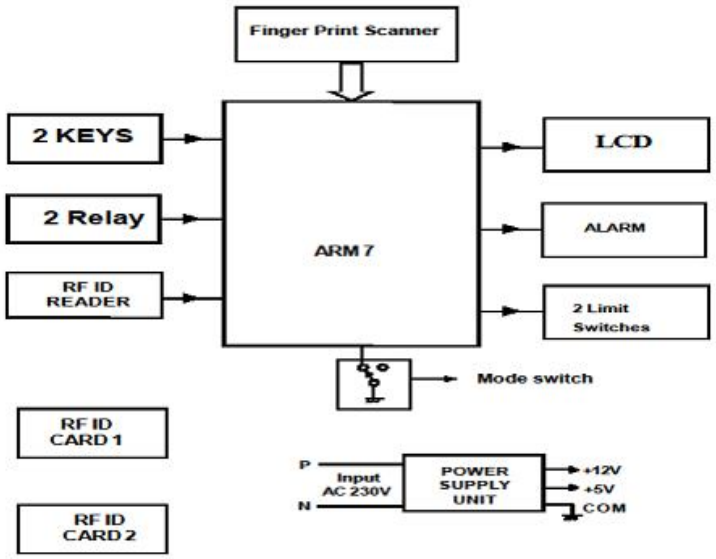

Figure 1 Block Diagram

III. FLOWCHART

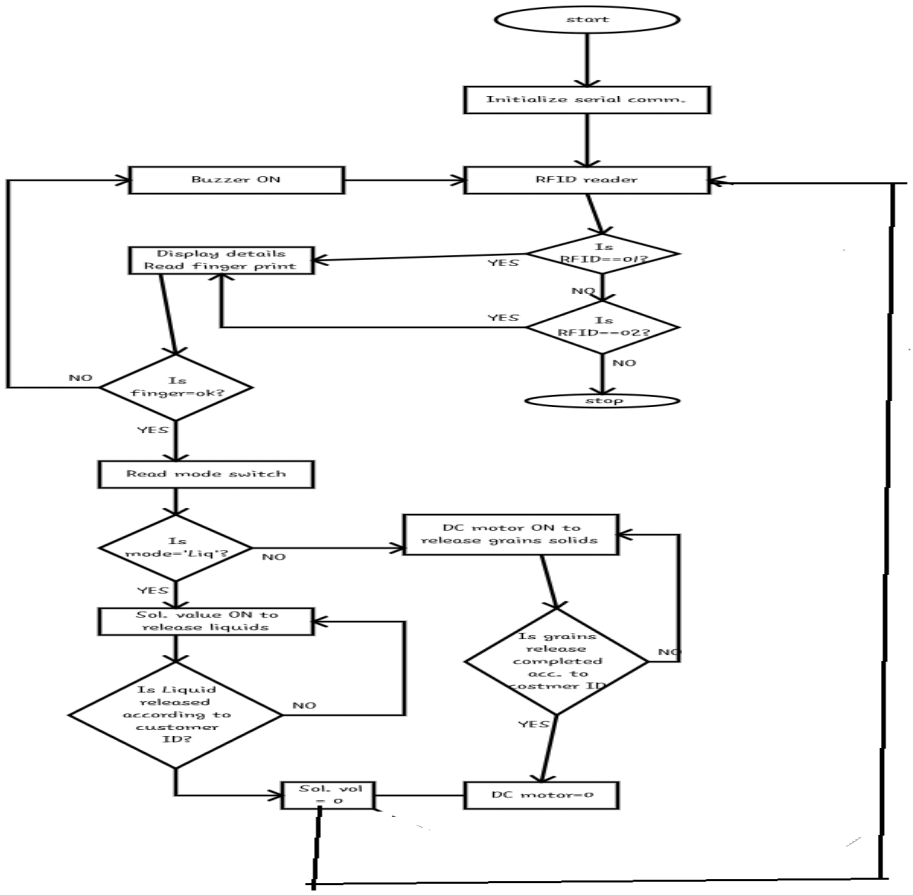

Figure 2 Flowchart

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IV. OPERATING PROCEDURE

A. RFID Technology

The proposed project work is designed to identify the person details. This is an innovative technology to get the details through RFID cards. Previously various types of photo identity cards with seal and signature are in use, now the trend is changed, to increase more safety / security smart cards in the form of Scratch cards, Magnetic cards etc, are developed, and these cards became popular. Generally these cards are supposed to be some physical contacts with data readers, in most cases the user inserts his/her card in the smart card reader, the smart card reader is nothing but a data decoder, and the decoded data is fed to a computer. Here the application is quite simple, the user information is stored and it is used for maintaining the record for the attendance purpose, recognition, etc. These kinds of systems are existed everywhere and are common now a days. To implement new trend in the smart ID card technology, this project work is taken up, which provides a wonder full feature of wireless technology to read the data of smart card through Radio Frequency technology.

B. Biometric Technology

Biometrics is automated methods of recognizing a person based on physiological or behavioral characteristics. . Biometric technologies are becoming the foundation of an extensive array of highly secure identification and personal verification solutions. As the level of security breaches and transaction fraud increases, the need for highly secure identification and personal verification technologies is becoming apparent. Biometric-based solutions are able to provide for confidential financial transactions and personal data privacy. The need for biometrics can be found in federal, state and local governments, in the military, and in commercial applications. Enterprise-wide network security infrastructures, government IDs, secure electronic banking, investing and other financial transactions, retail sales, law enforcement, and health and social services are already benefiting from these technologies.

C. ARM7 Controller LPC2148

The conventional 8 and 16bit Microcontrollers has its deficiencies when compared with 32bit microcontroller. This proposed system design uses the ARM processor. ARM architecture is based on Reduced Instruction Set Computer (RISC) principles, and the instruction set and related decode mechanism are much simpler than those of micro programmed Complex Instruction Set Computers. This simplicity results in a high instruction throughput and impressive real-time interrupt response from a small and cost-effective processor core. The Philips LPC2148 which is based on 32 bitARM7 TDMI core supporting real time simulation. When ARM processor combined with RTOS with timing constraint can be realized for the data acquisition and transmission of data with high precision. In this project work ARM controller is used to build a highly secured biometric ration distribution system with ease and simple to operate. A ration distributor controls this process. For demo purpose, the module is developed for two individual products i.e., solids and liquids. The outputs of these are two individual goods are controlled by DC motors by the ARM controller through their driving circuits (H-Bridge and Relay). Liquid output giving DC motor is controlled through Relay and the solids delivering output DC motor is controlled through H – Bridge IC as it will be controlled in both the directions. In this smart ration distribution every family is provided with one RFID tag consisting of their family details. If RFID tag is placed on RFID reader then the family details are displayed on LCD. If they are authorized then it will ask for biometric. If biometric is matched, it says that he/she is authorized otherwise it is unauthorized. If both RFID & biometric are matched then automatically grains are released and later kerosene is released. So, that we can reduce malpractice.

V. RESULTS

The project aims were to reduce the malpractices. The project shown in the figure has been implemented and works as expected and will prove to be very useful.Hence, such systems are very much useful for the government to reduce malpractices happening..

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VI. APPLICATIONS

A. Can be used at ration shop for avoiding malpractices.

VII. CONCLUSIONS

The project work "Smart ration distribution system using RFID and 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 area or where high level security is required.The proposed system is more secure and transparent than the normal existing system. Influence of fraud data entry in the ration database can be maintained simply with the use of this smart ration card system. Only authorized person (shopkeeper) can maintain the database. Customer can be authenticated using RFID swapping and thumb detection. In the plan, it is expected that the proposed system will be more transparent, reliable than the existing ration card system.

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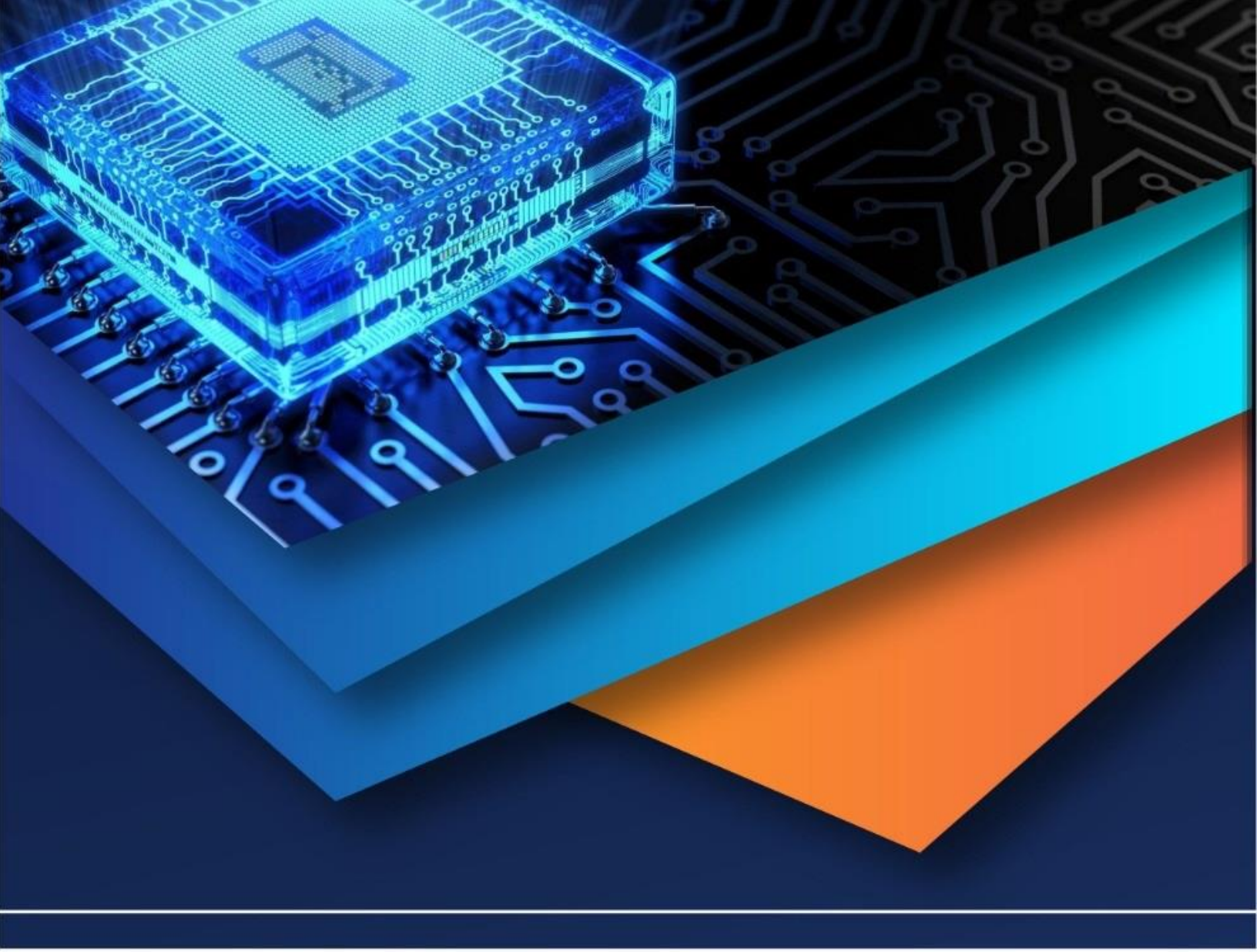

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