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Real Time Automatic Ration Material Distribution System

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Abstract: *Now a day ration card is very significant for every home and used for various field such as family members details, to get gas connection, Domicile certificate, Bank account , It act as address proof for various purposes etc. All the people having a ration card to buy the various materials (sugar, rice, oil, kerosene, etc.) from the ration shops. But in this system having two disadvantages, first one is weight of the material may be imprecise due to human mistakes and secondly, if not buy the materials at the end of the month, they will sale to others without any intimation to the government and customers. In this paper, proposed an Automatic Ration Materials Distribution Based on GSM (Global System for Mobile) and RFID (Radio Frequency Identification) technology instead of ration cards. To get the materials in ration shops need to show the RFID tag into the RFID reader, then controller check the customer codes and details of amounts in the card. After verification, these systems show the amount details. Then customer need to enter their required materials by using keyboard, after receiving materials controller send the information to government office and customer through GSM technology. In this system provides the materials automatically without help of humans.*

Keywords: — *Microcontroller, GSM, RFID, Motor, Solenoid Control Circuits, Mechanical Part.*

I. INTRODUCTION

The most of the people having a ration card to buy the materials from the ration shops. When get the material from the ration shop, first need to submit the ration card and they will put the sign in the ration card depends on the materials. Then they will issue the materials through weighting system with help of human. But in this system having two draw backs, first one is weight of the material may be inaccurate due to human mistakes and secondly, if not buy the materials at the end of the month, they will sale to others without any intimation to the government and customers. In this paper, we have proposed an Automatic Ration Materials Distribution Based on GSM and RFID Technology to avoid the drawbacks. Today we are facing a number of transport related problems. RFID technology effectively used to solve some of them. RFID is act as ration card and other purpose such as RC book, insurance details, service details etc. GSM used to converse the information between the two people or more than two persons to update the evidence depends on the supplies.

Radio-frequency identification (RFID) based access-control system allows only authorized or liable persons to get the materials from ration shops. An RFID system consists of an antenna or coil, a trans receiver (with decoder) and a transponder (RF tag) electronically programmed with unique information. There are many types of RFID systems available in the market. RFID classified based on their frequency ranges. Some of the most commonly used RFID kits are low-frequency (30-500 kHz), mid-frequency (900 kHz-1500MHz) and high-frequency (2.4-2.5GHz)[1]. the passive tags are lighter and less expensive than active tags [2]. Global system for mobile communication (GSM) is a globally accepted standard for digital cellular communication. GSM is a common European mobile telephone standard for a mobile cellular radio system operating at 900 MHz In the current work, SIM300 GSM module is used. The SIM300 module is a Triband GSM/GPRS solution in a compact plug in module featuring an industry-standard boundary. It delivers voice, data and fax in a small form factor with low power consumption [3, 4].In this paper, we have designed and implemented an Automatic Ration Materials Distribution system Based on GSM and RFID Technology. In this system, only authentic person can be improved ration materials from ration shops based on the amount available in the RFID.

A Ration Card is a document distributed under an order or authority of the State Government, as per the Public Distribution System, for the purchase of essential commodities from fair price shops. State Governments issue distinctive Ration Cards to Above Poverty Line, Below Poverty Line and Antyodaya families and conduct periodical review and checking of Ration Cards. It is very problematic and old procedure so now the time is for some change hence we represent Real Time Automatic Ration Material Distribution System.

II. LITERATURE REVIEW

The existing predictable ration system has the basic issues of renewing the ration card every year by the employees to the malpractices done by the ration store dealers like diverting food grains to open market to make profit. To tackle this problems K.Balakarthik proposed the “Cloud-Based Ration Card System using RFID and GSM Technology” [1], presents an efficient method for the user to buy the products in the ration shop by just irregular the card at the RFID reader. The user authentication is done by sending a random password text to the user mobile which has to be entered in a keypad. The purchase is validated by the employee only after the details are entered in a windows application which stores the user’s personal and purchase information. The current PDS involves corruption and illegal smuggling of goods because of manual work. A.N. Madur et.al. Developed the “Automation in Rationing System using Arm 7” [2],S.Valarmathy et.al. Proposed the “Automatic Ration Material Distributions Based on GSM and RFID Published in A R DIGITECH A R DIGITECH International Journal Of Engineering, Education And Technology (ARDIJEET) www.ardigitech.in ISSN 2320-883X, VOLUME 3, ISSUE 2, 01/04/2015 3 Technology” [4]. Here each customer is provided with RFID cards. In this system, first user is authenticated, and then system shows the balance of person. User have to enter the amount of Kg he want to withdraw. If the user will have sufficient balance to withdraw the current amount, system will open the valve. Through valve grain will come and it will get weighted by weight sensor. Once the count reached the entered amount controller automatically shut down the valve and updates the account of the customer.

Proposed the “Automatic Rationing System Using Embedded System Technology” [5], in this the ration distribution system is automated by using PLC. This automated ration system replaces the conventional ration card system by smart card. The proposed ration shop system is connected to the government database via GSM modules, which further sends the up-to-date information to the government and the consumer. So we suggested the “e- Ration Shop: An Automation Tool for Fair Price Shop under the Public Distribution System” [6], this paper discusses strategy adapted in using ICT to control diversion and leakage in the delivery device and its successful application in computerization of food grain supply chain.

III. EMBEDDED SYSTEMS OVERVIEW

3.1 Introduction of Embedded System:

An Embedded System is a combination of computer hardware and software, and perhaps additional mechanical or other parts, designed to perform a specific function. A good example is the microwave oven. Almost

every household has one, and tens of millions of them are used every day, but very few people realize that a processor and software are involved in the preparation of their lunch or dinner.

This is in direct contrast to the personal computer in the family room. It too is comprised of computer hardware and software and mechanical components (disk drives, for example). However, a personal computer is not designed to perform a specific function rather; it is able to do many different things. Many people use the term general-purpose computer to make this distinction clear. As shipped, a general-purpose computer is a blank slate; the manufacturer does not know what the customer will do with it. One customer may use it for a network file server another may use it exclusively for playing games, and a third may use it to write the next great American novel. If an embedded system is designed well, the existence of the processor and software could be completely unnoticed by the user of the device. Such is the case for a microwave oven, VCR, or alarm clock. In some cases, it would even be possible to build an equivalent device that does not contain the processor and software. This could be done by replacing the combination with a custom integrated circuit that performs the same functions in hardware. However, a lot of flexibility is lost when a design is hard-coded in this way. It is much easier, and cheaper, to change a few lines of software than to redesign a piece of custom hardware.

3.2 Real Time Systems

One subclass of embedded is worthy of an introduction at this point. As commonly defined, a real-time system is a computer system that has timing constraints. In other words, a real-time system is partly specified in terms of its ability to make certain calculations or decisions in a timely manner. These important calculations are said to have deadlines for completion. And, for all practical purposes, a missed deadline is just as bad as a wrong answer.

The issue of what if a deadline is missed is a crucial one. For example, if the real-time system is part of an airplane's flight control system, it is possible for the lives of the passengers and crew to be endangered by a single missed deadline. However, if instead the system is involved in satellite communication, the damage could be limited to a single corrupt data packet. The more severe the consequences, the more likely it will be said that the deadline is "hard" and thus, the system is a hard real-time system. Real-time systems at the other end of this discussion are said to have "soft" deadlines.

3.3 Global system for mobile communication

It is a globally accepted standard for digital cellular communication. GSM is the name of standardization group established in 1982 to create a common European mobile telephone standard that would formulate specifications for a pan-European mobile cellular radio system operating at 900MHZ. Throughout the evolution of cellular telecommunications, various systems have been developed without the benefit of standardized specification. This presented many problems directly related to compatibility, especially with the development of digital radio technology.

3.4 EEPROM

EPROM is a type of non volatile memory used in many modern electronic devices that wish to store memory for a specific amount of time, and also want it to be erased at given times. EEPROM or E2PROM is an acronym for Electrically Erasable Programmable Read Only Memory. Earlier Erasable Programmable Read Only Memory (EPROM) chips contained {or did not, if the manufacturer wished to make One Time Programmable (OTP) chips} a tiny quartz window that allowed Ultraviolet (UV) light to enter the chip and erase the non volatile memory stored in it. EEPROM data can be erased electrically (as the name itself suggests) by the phenomenon of field electron emission. This technique allows the ROM to retain its data consistently, and also be ready for a re-programming when needed, or an erasure if necessary.

3.5 RFID

Radio-frequency identification (RFID) is an automatic detection method, relying on storing and remotely retrieving data using devices called RFID tags or transponders. The technology requires some extent of cooperation of an RFID reader and an RFID tag. An RFID tag is an object that can be applied to or incorporated into a product,

animal, or person for the purpose of identification and tracking using radio waves. Some tags can be read from several meters away and beyond the line of sight of the reader. Most RFID tags contain at least two parts. One is an integrated circuit for storing and processing information, modulating and demodulating a radio frequency (RF) signal, and other specialized functions. The second is an antenna for receiving and transmitting the signal. There are generally two types of RFID tags: active RFID tags, which contain a battery, and passive RFID tags, which have no battery. This project uses passive tags. Read-only tags are typically passive and are programmed with a unique set of data (usually 32 to 128 bits) that cannot be modified. Future chip less RFID allows for discrete identification of tags without an integrated circuit, thereby allowing tags to be printed directly onto assets at a lower cost than traditional tags. Currently (2008) none of the chip less concepts has become operational. Today, RFID is used in enterprise supply chain management to improve the efficiency of inventory tracking and management

IV. PROPOSED WORK

4.1 Block Diagram

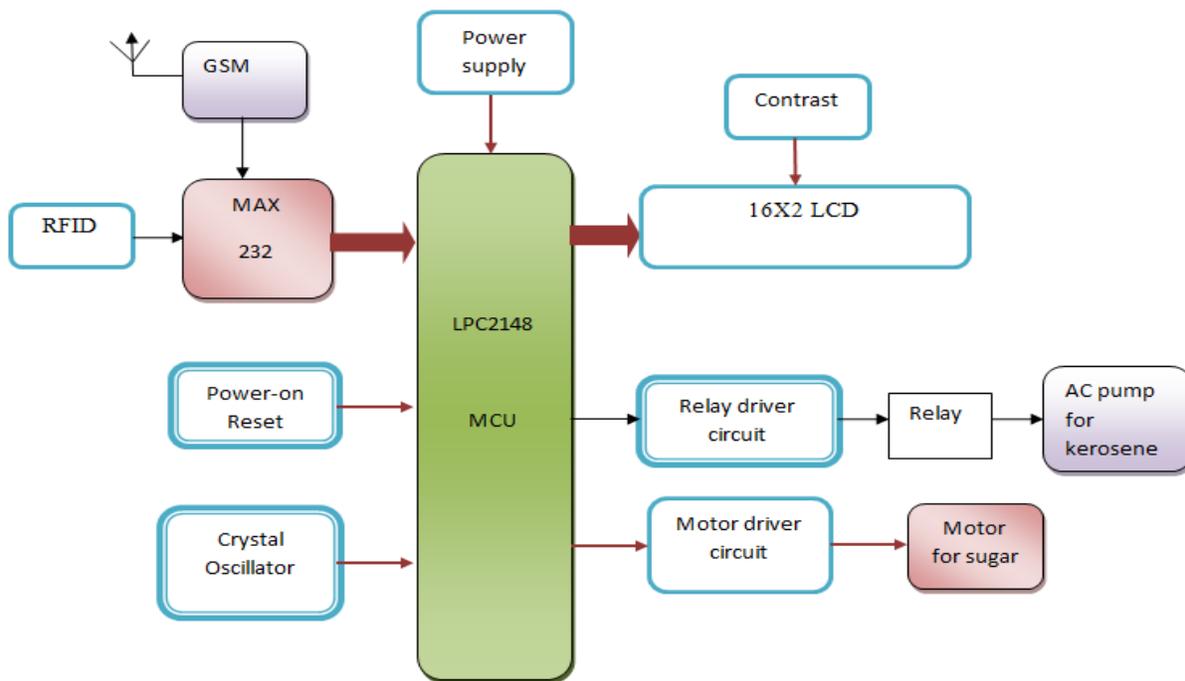


Fig. 1: Block diagram of ration materials distributions system

The block diagram of an Automatic Ration Materials Distribution Based on GSM and RFID Technology is shown in the Fig. 1. This system consists of various parts such as RFID, GSM, microcontroller, motor driver, solenoid control circuits and keyboard. The proposed system demonstrates distribution of solid as well as liquid consumer materials that is grains (wheat/rice) and kerosene. RFID reader, ultrasonic sensor, load cell and keypad acts as inputs to system and LCD is used for displaying ration stock and related activities. The microcontroller outputs are used to drive motor and solenoid valve.

4.2 Algorithm

Algorithm of proposed system is:

1. Every consumer is provided with a RFID card which is registered by the Government authority.
2. At the time of ration distribution at ration shop, first password of consumer is verified.

3. User ID verified with the database provided by the Government authority which is stored in the microcontroller.
4. Once verification is successful, consumer is asked for a select type of material and quantity required through push buttons and keypad respectively.
5. Based on type of material chosen, the motor or solenoid valve is activated.
6. The load cell or level indicator is checked for proper quantity.
7. After collecting proper quantity material motor or solenoid is disabled.
8. GSM module will send the information in form of SMS to the user as well as PDS authority.
9. Current stock in the ration shop is displayed using LCD.

4.3 Flow Diagram

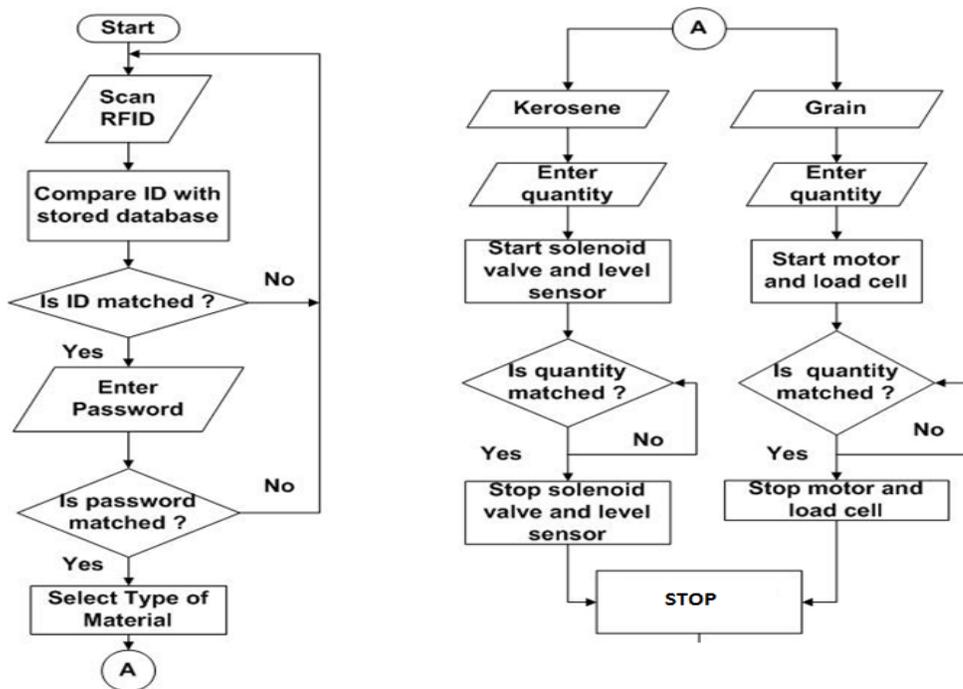


Fig. 2 shows flow chart of the proposed public distribution system

V. CONCLUSION

The conventional Ration Materials Distribution system has drawbacks like weight of the material may be inaccurate due to human mistakes, low processing speed, long waiting time at ration shop to get material and material theft in ration shop. If materials are not buying at end of the month by consumer, they will sale to others without any intimation to the government and consumer. To overcome above problems, automatic ration shop played important role. The automatic ration shop involved RFID as well as GSM technology to distribute the kerosene or grain material. Ration card is replaced by RFID and information is sent to consumer using GSM module. The proposed system creates the transparency in public distribution system as the work becomes automatic. In this system, ration Materials (sugar, rice, oil, kerosene, etc) distributed through automatic mechanism without any help of humans. With the help of this system, it is possible to make public distribution system efficient and free from malpractices. After receiving the materials, controller sends the information to government office and customer through GSM technology. The proposed system has advantages like it is helpful to prevent malpractices at ration shop, maintain data properly, reduces paper work, time saving approach and cost effective.

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