Automation in Ration Distribution System

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Abstract: Public distribution system i.e. Ration distribution system is one of the widely controversial issues that involves corruption and illegal smuggling of goods. This fraud is increases due to the manual involvement and manual measurement, this fraud occurs due to the wrong entries in register without the knowledge to the ration card holder because of this large amount of money of government get wasted and needy person remains needy. To avoid this fraud we have developed system by using Microcontroller, in this system we have proposed smart card instead of ration card and also provide smart card detector to verify correct person or family member if the detected person is correct then next step takes place. In this system user database already stored in the system. GSM is used to send the information to ration card holder and also to the government.

Keywords: PIC microcontroller, GSM module, Solenoid valve, Smart card.

I. INTRODUCTION

Government provide subsidies to the ration distribution system for the bellow poverty line people but major problem with such system having insufficiency in the targeting beneficiaries and also material of ration get wasted in case of the ration card holder not came to collect ration that material is robbed by making wrong entries. To avoid such fraud we have developed an automatic ration distribution system. This system mainly consist of embedded PIC controller which is used for control the overall system, solenoid valve is used for control of kerosene, Two stepper motor is used for delivery of rice and sugar.

In this system firstly ration card holder is have to use smart card which is allotted to all ration card holder by inserting his / her smart card if the user is correct then next step takes place, then user have to click on required material as he want like kerosene, rice, sugar, wheat etc. user have to select quantity of the material on selected quantity we have given some specific timing for delivery of the material to the user, when the material is received by the ration card holder at the same time SMS will deliver to the user and also to the government. This would bring transparency between the governments, ration card holder and ration distributer. As there direct communication between ration card holder and government.

II. LITERATURE SURVEY

Abdul H. Ansari, KetanG. Badgujar, Monali R. Rathi, Shital R. Tambe Developed the [1]"Automation in Rationing System Using GSM and RFID Technology" In this system they 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. GSM used to communicate the information between the two people or more than two persons to update the information depends on the requirements. The proposed system design and implementation is based on GSM and RFID Technology. In this system, only authentic person could recover ration materials from ration shops based on the amount available in the RFID. Further to prevent irregularities in distribution of ration, Government can provide/supply various products (like rice, wheat, kerosene, cooking oils etc.) to rationing shops in the form of sealed packets instead of the sack. This would bring the transparency in public distribution system as there will be a direct communication between people and Government through this technology.

A.N. Madur [2] developed the "Automation in Rationing System using Arm 7" In system design and implementation is based on GSM and RFID Technology. In this system, only authentic person could recover ration materials from ration shops based on the amount available in the RFID. Further to prevent irregularities in distribution of ration, Government can provide/supply various products (like rice, wheat, kerosene, cooking oils etc.) to rationing shops in the form of sealed packets instead of the sack. This would bring the transparency in public distribution system as there will be a direct communication between people and Government through this.

S.Valarmathy Proposed the [3] "Automatic Ration Material Distributions Based on GSM and RFID Technology". 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. The updated account information is send to the customer's mobile using GSM. Rationing distribution is one of the widely controversial issue that involves wrong entries in stock register of shop containing wrong stock information of the products that is supplied to the public, so Rajesh C. Pingle [4] Suggested the "Automatic Rationing for Public Distribution System (PDS) using RFID and GSM Module to Prevent Irregularities", in this automated system conventional ration card is replaced by smartcard To involve government in the process we proposed connecting the system at ration shop to a central database (provided by government.) via GSM. Hence it is possible to prevent the corruption and irregularities at ration shop.

S.Sukhumar Proposed the [5] "Automatic Rationing System Using Embedded System Technology", 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.

III.PROPOSED SYSTEM

Some of the limitation of the conventional ration shop system:
1. Corruption in the Government and market sector can be prevented if this system becomes automated.
2. Cost effective approach.
3. Time saving approach.
4. This system helps to maintain the data properly.

Due to manual measurement in the conventional system, the user cannot able to get the accurate quantity of material to overcome the problem in current system we are going for the Automation of ration shop. In automatic ration shop we use PIC Microcontroller for controlling purpose. Three different commodities like sugar, rice, and kerosene can be counted using three measuring set ups. Inputs are given directly from mechanical switches. The controller outputs are used to drive motors and solenoid valves. Block diagram of the ration distribution system mainly consist of smart card interfacing, LCD interfacing, GSM interfacing, keyboard, solenoid valve for the controlling of the kerosene, two stepper motor for delivery of the rice and sugar. Following figure shows block diagram of ration distribution system. The automatic system mainly consists of three interfaces smart card, touch screen and GSM and these three interfaces are interfaced with Micro controller. Embedded PIC micro controller is interfaced government database.
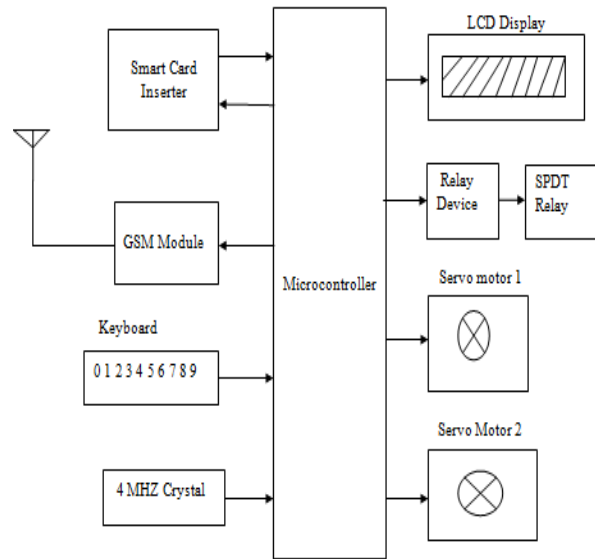

Fig.1. block diagram of proposed system

The ration card holder would have to insert the smart card on the system, which was given to all ration card holder separately. Consider the consumer has provision for three input material like rice, sugar, and kerosene .suppose first input is given by the consumer is rice means green light indicates that the rice is coming out from the machine first then by pressing start button stepper motor will on then product can be collected in the bag. As soon as the first input is collected then it check for the second input and same process will takes place for the next input. After this process all input information is given to the government also to consumer on registered mobile number.

IV. HARDWARE DESCRIPTION

A. PIC MICRO CONTROLLER

PIC microcontrollers (Programmable Interface Controllers) are electronic circuits that can be programmed to carry out a vast range of tasks. They can be programmed to be timers or to control a production line and much more. They are found in most electronic devices such as alarm systems, computer control systems, phones, in fact almost any electronic device. Many types of PIC microcontrollers exist, although the best are probably found in the GENIE range of programmable microcontrollers.

A. GSM

GSM system is the most widely used cellular technology used in the world today. GSM stands for global system for Mobile Communication. GSM digitizes and compresses data, then sends it down a channel with two other streams of user data, each in its own time slot. It operates at either the 900 MHz frequency band. GSM modem is wireless modem that works with a GSM Wireless network. After distribution of the material controller send the information about the distribution of material to the government office and consumer throw GSM Technology. This would bring

transparency in public distribution system as there will be direct communication between people and government.

B. Solenoid Valve

Solenoid value: solenoid value is an electromechanically operates value. The value of controlled by an electric current through a solenoid in proposed system we are using one solenoid value for kerosene value controller circuit. The actual withdrawal of material takes place here.

C. Smart card

The general block diagram of the system consist of the card which provides a predefined code and balance amount (STORED IN THE EEPROM OF the card IC) every card has some unique code stored in its EEPROM also known as firmware, is an integrated circuit programmed with specific data when it is manufactured. Working with ROM's and EPROM's can be a wasteful business. Even though they are inexpensive per chip, the cost can add up over time. Erasable programmable read-only memory (EPROM) addresses this issue. EPROM chips can be rewritten many times. Erasing an EPROM requires a special tool that emits a certain frequency of ultraviolet (UV) light. EPROM's are configured using an EPROM programmer that provides voltage at specified levels depending on the type of EPROM used. In the smart card we used a two-wire serial EEPROM AT24C04 is used in the circuit to store the ID code and balance amount, as the memory ensures reading of the latest saved settings by the micro controller. This 12C bus-compatible-2048-bit (2-kbit) EEPROM is organized as 256x8 bits. It can retain data for more than ten years. Using just two lines (SCL and SDA) of the memory, the micro controller can read the data when user can be connect with the reader.

D. Power supply

The power supply circuit. It's based on 3 terminal voltage regulators, which provide the required regulated +5V and unregulated +12V. Power is deliver initially from standard 12V AC/DC adapter or 12V_500ma Transformer. This is fed to bridge rectifier (D3, 4, 5, 7) the output of which is then filtered using 1000uf electrolytic capacitor and fed to U5 (voltage regulator). U5 +5V output powers the micro controller and other logic circuitry. LED L2 and its associate 1K current limiting resistors provide power indication. The unregulated voltage of approximately 12V is required for GSM Modem and relay, driving circuit.

V. RESULT AND DISCUSSION

The Automatic Ration Materials Distribution used to distribute the liquid or solid material, which is used for Ration materials distribution in ration shops. Initially everyone will be provided a smart Card, instead of a ration card. If the customer needs to get any ration material, the user has to show the smart card. Each user will have a unique number, which is not visible to the user. This

recognized smart card number is given to the microcontroller, which compared the input number with the database. Before starting the system, the unique smart card number of the ration user will be programmed in the controller, such as User name & address details, date of expire of ration card, etc., so that the controller will recognize the data coming from smart card by comparing with the database. Once the user is identified, the microcontroller will check whether the user has already bought the ration item belongs to that month. If not then, ration items to be dispensed will be displayed on the LCD screen, the user has to feed the comments that which ration item he is going to buy. If the user, select the ration item for purchasing purposes then the controller will calculate the amount of his or her buy and check with the amount available in the smart card. If he or she has sufficient amount to buy then the micro controller will start the solenoid and motor mechanism to dispense the selected ration item. As the dispensing process is going on simultaneously in the controller will send a command to GSM Modem, to send the text SMS to the user about the ration item.

Output results

Fig.2. Ration material distribution kit

Fig.3. Overall ration distribution system with mechanical parts
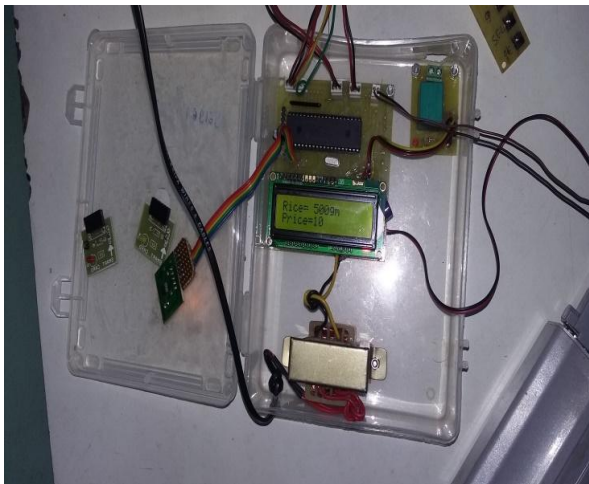
Fig.4. Enter your smart card

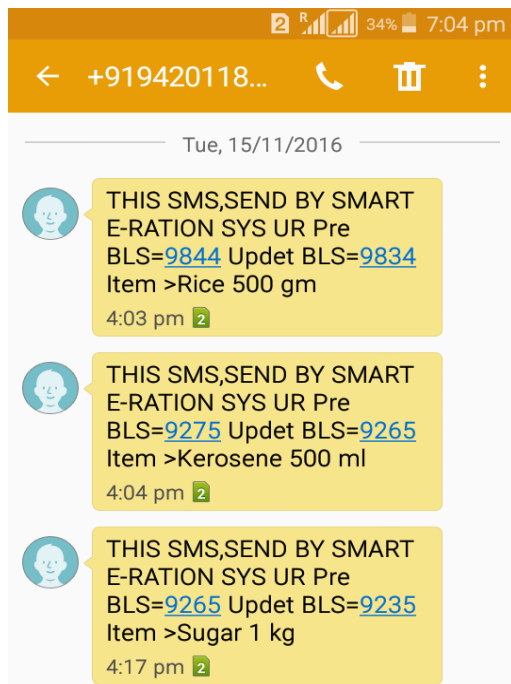Fig.5. Quantity and ration material selection

Fig.6. Customer received SMS after deliver material

VI. CONCLUSION

This proposed system provides safe, secure & efficient public distribution system. By using this system ration shop can be automated. It solves the problem of manual work in public distribution system & provides benefit to the government by sending current stock information to the government database via GSM & reduces manpower.

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