Color and RFID Based Public Rationing System

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Abstract

Now-a-days ration card is very important for every home and used for various fields such as family members' details, to get gas connection, it acts as address proof for various purposes etc. All the people are having a ration card to buy the various materials (sugar, rice, oil, kerosene, etc.) from the ration shops. But this system has two drawbacks, 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, shopkeepers will sale it to others without any intimation to the government and customers. Ration card is a very necessary document for every citizen in India. Ration card is used to purchase various necessary items like sugar, oil etc. from the ration shops at a cheaper rate, issued by the government. This ration card also acts as address as well as identity proof. Ration card is needed when you apply for passport, PAN number, driving license etc. Hence, ration card is a very important document. But, the current ration card system has a drawback, that if the items are not sold up to the last of the month, then the shopkeeper will sell it to someone else and take the profit into his pocket and put some false reading in the government record diary.

Keywords— LPC2148 Microcontroller, LCD display,L293D driver IC,DC motor, GSM, RFID tag, RFID reader,MAX232,Buzzer,etc.

INTRODUCTION

When getting the material from the ration shop, first customers 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 drawbacks, 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.

The utility of Aadhaar for delivery of the various government schemes was envisioned at the very start of the project. With this 'big-picture in mind, the entire project on Aadhaar enabled PDS was divided into four phases. In this research paper, the proposed concept is to replace the manual work in public distribution system. The ration distribution system is automated by using ARM processor and MATLAB, which is similar to the ATM. This automated ration system replaces the conventional ration card system by smart card. In this system we are using Color ration card and RFID card to provide transparency.

War II to supply food grains, sugar and kerosene oil at a relatively cheaper rate. Ration card acts as the address/identity proof of a person. It includes the identity of the person along with his family members, their names, ages, gender. According to number of members in the family, ration will be given in that proportionate ratio.

Ration Card is one of the important documents for every Indian family. Every family is given facility by government to receive food grains against a card. But there is lot of corruption involved in TPDS such as black marketing of the subsidized food grains as many families do not claim their quota of food grains and many families claim the quota of other families. As a solution to above

problems this paper proposes a system which is highly scalable Ration Distribution System based on embedded system. The main target of this project was to bring transparency between government and customer, and this transparency is provided by webpage.

RELATED WORK

Smart Ration Distribution and Controlling:

This paper proposes the advanced Ration Distribution System, named as "Smart Ration Distribution and Controlling". Huge amount of Govt. money get wasted due to corruption in the conventional Ration Distribution System. This paper implements a simple PDA device (personal data assistant) with RFID tag used as an e-ration card in place of a conventional ration card. This PDA device is similar to the ticketing machine used by bus conductor or bank pigmy agent and the e - ration card is similar to swipe card.

The Subscriber has to use this card instead of a traditional ration card to get ration from the dealer. Efforts are put together from our side to combat corruption and to have better management of public distribution system[1].

Smart Ration Card Using RFID and GSM Technique:

In this paper, we have developed a smart ration card using Radio Frequency Identification (RFID) technique to prevent the ration forgery as there are chances that the shopkeeper may sell the material to someone else and take the profit and put some false amount in their records. In this system, a RFID tag is used that carries the family member details and the customer needs to show this tag to the RFID reader. The microcontroller connected to the reader will checks for the user authentication. If the user is found authentic then the quantity of ration to be given to the customer according to the total number of family members will be displayed on display device.

This smart ration card is free from theft as the information about the delivered ration will be send directly to the government without manual feeding using Global system for Mobile Communication (GSM) technique[2].

Automatic Ration Material Distributions Based on GSM and RFID Technology:

Now a day ration card is very important for every home and used for various field such as family members details, to get gas connection, 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 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[5].

EXISTING SYSTEM

The present ration distribution system has drawbacks like inaccurate quantity of goods, low processing speed, large waiting time, material theft in ration shop. 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 present PDS works in a multiple level where the responsibilities are shared between center and state. The task of procuring or buying food grains such as wheat and rice at minimal cost is the responsibilities of center. Allocation of the grains to each state in carried out by center. While the state government are responsible for the identification of household eligible to avail the facilities. The process runs as follows, the grains are transported by the center to every state's central depot, after which the allocated food grains are delivered to respective FPS through state government. Finally FPS being the end point sells the entitled commodities to beneficiaries.

In the existing system, tasks like product distribution,

Ration Card entry, product weighing and delivery of the product are carried out manually by FPS agent. However a present system has diverse drawbacks involved, developing irregularities in the system. Some of the irregularities include replacing actual products dispensed by the government with meager quality products and supplying the same for the beneficiaries, diverting food grains to open market to make profit, false entries in the stock registers that FPS agent needs to maintain and false announcement of deceit in food grains [4], Automation in ration shop using PLC', proposed a technique for proportion shop computerization utilizing embedded PLC. Assist the updating to the legislature database about the stock accessible and the client points of interest were not carried out.

PROPOSED SYSTEM

The proposed system replaces the manual work in ration shop. The main objective of the designed system is the automation of ration shop to provide transparency. The proposed automatic ration shop for public distribution system is based on Radio Frequency Identification (RFID) technology that replaces conventional ration cards. The RFID tags are provided instead of conventional ration cards. Customer's database is stored in microcontroller which is provided by Government Authority. Customer needs to scan tag to RFID reader, and then microcontroller checks customer's details with stored to distribute material in ration shop. After successful verification, customer needs to enter type of material as well as quantity of material using keypad. After delivering proper material to consumer, the microcontroller sends the information to customer as well as PDS authorities using Global System for Mobile (GSM) technology.

ALGORITHM

Step 1:- Start
Step 2:-Camera capture image.
Step 3:- Image get process in MATLAB.
Step 4:-If image match with database of color then different character pass to Microcontroller Unit.

Step 5:-RFID Reader get active to swap user tag.
Step6:-If user card Is of Poor person, then microcontroller gives indication to L293D circuit and according to that dc motor get rotate.
Step 7:-Dc Motor Stop Rotating
Step 8:-Message Send Through GSM To User/ Ration Distributer/ Government Officer.
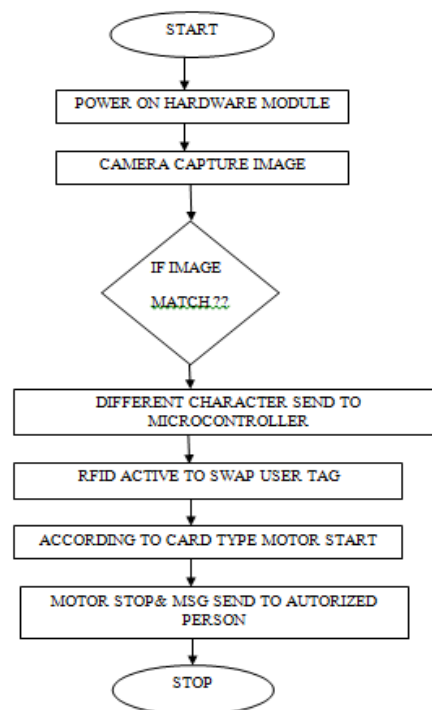Step 9:- Stop.

FLOWCHART

Fig.1 Flowchart of smart rationing system
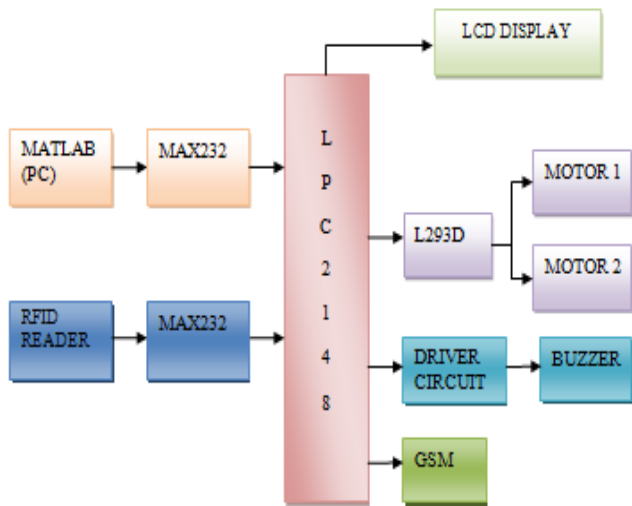
BLOCK DIAGRAM OF SYSTEM
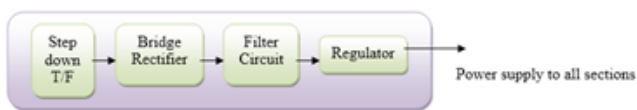
Fig.2 Block diagram of overall system

Fig.3 Block diagram of system with power supply

- In this project we recognize three different color we supposed that 3 color determine three different categories for example orange, white, yellow.
- Firstly camera capture image, image get process in MATLAB.
- If image match with database of color then different character pass to Microcontroller Unit.
- At that time RFID Reader get active, user have to swap their tag.
- If user card is of Poor person, then microcontroller give indication to L293D circuit and according to that dc motor get rotate.
- After dc motor stop rotating through GSM message as send to user/ ration Distributer/ Government Officer.
- This project uses regulated 5v, 750mA power supply. 7805, a three terminal voltage regulator is used for voltage regulation. Bridge type full wave rectifier is used to rectify the ac output of secondary of 230/12v step down transformer.

CIRCUIT DIAGRAM

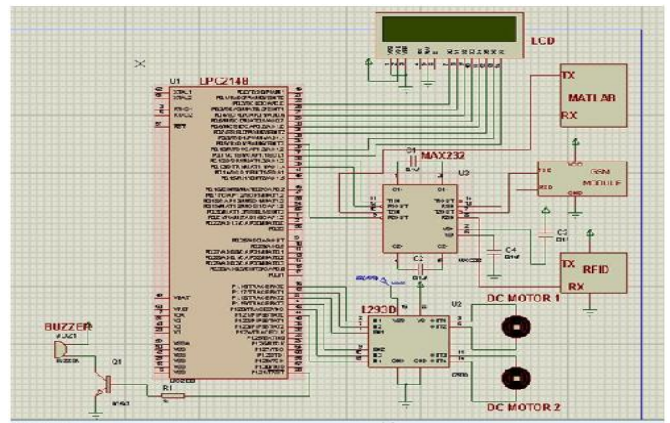The circuit diagram of overall system is as shown in Fig.3

Fig.4 Circuit diagram

HARDWARE REQUIREMENT
LPC2148 CONTROLLER

The LPC2141/42/44/46/48 microcontrollers are based on a 16-bit/32-bit ARM7TDMI-CPU with real-time emulation and embedded trace support, that combine microcontroller with embedded high speed flash memory ranging from 32 KB to 512 KB. A 128-bit wide memory interface and unique accelerator architecture enable 32-bit code execution at the maximum clock rate. For critical code size applications, the alternative 16-bit Thumb mode reduces code by more than 30 % with minimal performance penalty. Due to their tiny size and low power consumption, LPC2141/42/44/46/48 are ideal for applications where miniaturization is a key requirement, such as access control and point-of-sale. Serial communications interfaces ranging from a USB 2.0 Full-speed device, multiple UARTs, SPI, SSP to I2C-bus and on-chip SRAM of 8 KB up to 40 KB, make these devices very well suited for communication gateways and protocol converters, soft modems, voice recognition and low end imaging, providing both large buffer size and high processing power. Various 32-bit timers, single or dual 10-bit ADC(s), 10-bit DAC, PWM channels and 45 fast GPIO lines with up to nine edge or level sensitive external interrupt pins make these microcontrollers suitable for industrial control and medical systems.

LCD(LIQUID CRYSTAL DISPLAY) Display

LCD stands for Liquid Crystal Display. LCD is finding wide spread use replacing LEDs (seven segment LEDs or other multi segment LEDs) because of the following reasons:

- The declining prices of LCDs.
- The ability to display numbers, characters and graphics. This is in contrast to LEDs, which are limited to numbers and a few characters.
- Incorporation of a refreshing controller into the LCD, thereby relieving the CPU of the task of refreshing the LCD. In contrast, the LED must be refreshed by the CPU to keep displaying the data.
- Ease of programming for characters and graphics.
- These components are "specialized" for being used with the microcontrollers, which means that they cannot be activated by standard IC circuits. They are used for writing different messages on a miniature LCD.

GSM MODULE

GSM module is used in many communication devices which are based on GSM (Global System for Mobile Communications) technology. It is used to interact with GSM network using a computer. GSM module only understands AT commands, and can respond accordingly. The most basic command is "AT", if GSM respond OK then it is working good otherwise it respond with "ERROR". There are various AT commands like ATA for answer a call, ATD to dial a call, AT+CMGR to read the message, AT+CMGS to send the SMS etc. AT commands should be followed by Carriage return i.e. \r (0D in hex), like "AT+CMGS\r". We can use GSM module using these commands.

MAX232

The MAX232 is an integrated circuit first created in 1987 by Maxim Integrated Products that converts signals from a TIA-232 (RS-232) serial port to signals suitable for use in TTL-compatible digital logic circuits. The MAX232 is a dual transmitter / dual receiver that typically is used to convert the RX, TX, CTS, RTS

signals. The drivers provide TIA-232 voltage level outputs (about ±7.5 volts) from a single 5-volt supply by on-chip charge pumps and external capacitors. This makes it useful for implementing TIA-232 in devices that otherwise do not need any other voltages. The receivers reduce TIA-232 inputs, which may be as high as ±25 volts, to standard 5 volt TTL levels. These receivers have a typical threshold of 1.3 volts and a typical hysteresis of 0.5 volts. The MAX232 replaced an older pair of chips MC1488 and MC1489 that performed similar RS-232 translation. The MC1488 quad transmitter chip required 12 volt and -12 volt power,[1] and MC1489 quad receiver chip required 5 volt power.[2] The main disadvantages of this older solution was the +/- 12 volt power requirement, only supported 5 volt digital logic, and two chips instead of one

ADVANTAGES

1. Increased corruption in the Govt. As well as market sector can be prevented if system becomes automated. Individual Ration Card search based on family members' Aadhaar number/mobile number.
2. Covers the process of Aadhaar Card issuance at the Panchayat level in villages and MC in urban areas fully automate system thus Reduces human efforts.
3. Data entry of Ration Card data into the e RCMS at district level through out-sourcing.
4. Simple in operation
5. Easily recognize card using raspberry pi
6. Less man power required
7. Will be always better than human controlling.

RESULTS

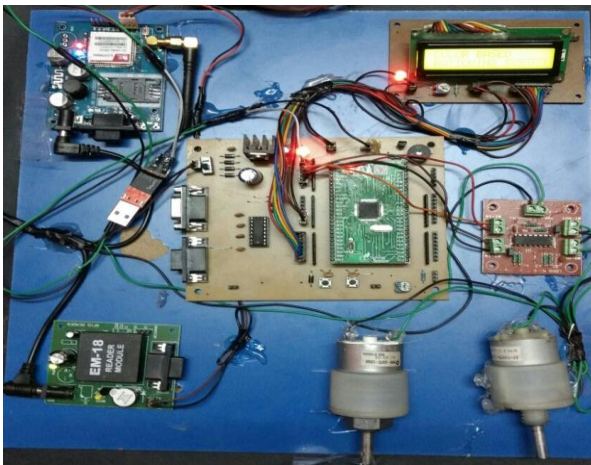Our Overall developed smart rationing system is shown in Fig.5 below,

Fig.5 Overall Developed System

When we switch on the system, at initial condition the LCD Display is as shown in Fig.6

Fig.6 LCD Display

RFID and Ration card for customer verification and validation is as shown in Fig.7

Fig.7 RFID and Ration card

For customer categories, MATLAB code is used to verify whether customer is valid or not. Execution of MATLAB code is as shown in Fig.8
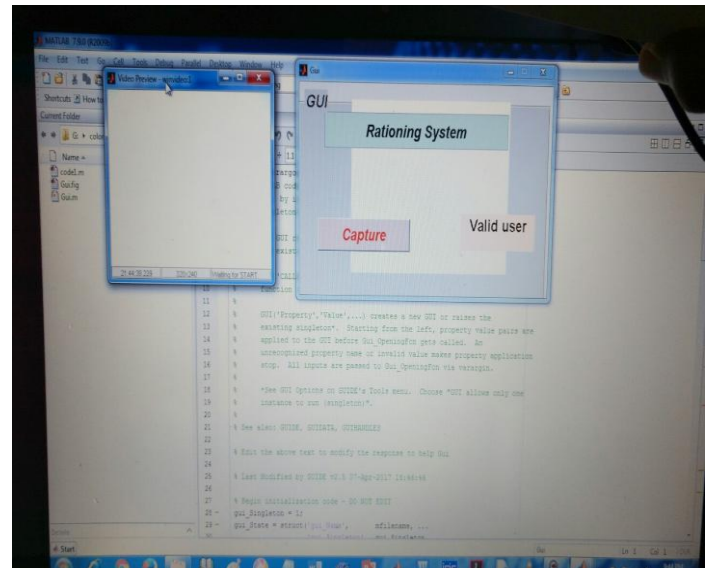

Fig.8 MATLAB code execution

When the grain is distributed to customer, GSM sends message to customer's registered mobile number as shown in Fig.9
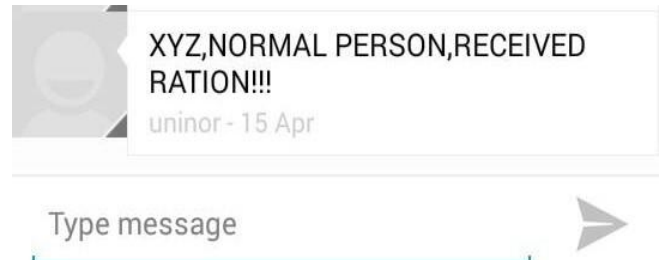

Fig.9 Received Message

APPLICATIONS

- Replacement for existing Ration Distribution System It can replace the existing Government Of India's Ration Distribution System which is responsible for distributing essential commodities to a large number of people through a network of FPS (Fair Price Shops) on a recurring basis.
- Our system also performs the same functions in an automated way.
- To distribute grains without corruption.

FUTURE SCOPE

- For better understanding, an interface and website can be made available in different languages

(regional languages).

- For the ease of use, an application can be built for the same.
- Kiosk can be developed for the beneficiaries to check the commodities available.
- Automatic weighing system can be implemented at the FPS.

Conclusion

This proposed project can provide a safe, secure and efficient way of public distribution system. By using this technique ration shops solves the problem of too much manual process in Public Distribution System (PDS). This proposed project definitely paves way for a corruption reduced India in the future.

This new technology gives solution and this work will make a great change in public distribution system and provides benefit to the government about current stock information and reduce the manpower.

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