Design of Ration Distribution System to Stop the Corruption using AVR: A Review

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Abstract: In this project, the proposed concept is to replace the manual work in public distribution system. The ration distribution system is automated by using embedded system technology, which is similar to the ATM. This automated ration system replaces the conventional ration card system by smart card. In addition, the finger print smart card is placed in the machine in order to check the correct user access. If the user is correct user, the next process takes place. As soon as the input is given, the products are obtained from the automated ration shop and the amount is taken from account of the particular person. The embedded controller is pre-programmed in such a way to perform the similar operations. In this automated ration shop government have control over all transaction that occurs in ration shop. In order to involve government in the process, 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. For the efficient operation and economic constraints of the system, the power supply unit is fully made alternate to solar power.

Keywords: Ration Distribution System, Finger Print Module, RFID, GSM Module, Microcontroller, LCD.

I. INTRODUCTION

The ration distribution system is one of the largest government's economic policies in India. Its main motto is to provide food grains (sugar, wheat, rice, kerosene etc.) to the people at affordable rates. The network of the ration shops is spread all over in India to provide food security to the people. This distribution of ration is controlled and monitored by central government, along with the state government. But it has so many limitations. Most of the ration shopkeepers keep fake ration cards with them. Due to fake ration cards, the dealer receives the extra ration from higher authority and he sales it into the open market. The dealer may not provide a sufficient amount of food grains to consumers. Most of the time people are not aware of the availability of ration in ration shop.

The dealer may sale ration at higher rates than recommended by the government or he may do wrong entries in register. In this way, in the current situation we are facing problem of corruption in public distribution system. There is no such effective system through which government gets acknowledgement of consumption of food grains by people.

A. Existing System
The most of the people having a ration card to   buy the materials from the ration shops. When get the material from the ratio shop, first need to submit the ration card and they will put the sign in the ratio 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. 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 grain.

B. Objectives
a) To avoid huge amount of Govt. money get waste due to corruption in the conventional Ration Distribution System.
b) To reduce a gap contentious issue that involves corruption and illegal smuggling of commodities.
c) A transparent and highly scalable Ration Distribution system with authentication for Ration Card Holder.

d) To propose an approach to automate all the above said manual jobs and the whole thing from data entry to weighing to hammering is prepared by machines and the people have no hand in that. This provides high reliability and there brings a sense of truthfulness to the people.

C. Proposed System

In this project, the proposed concept is to replace the manual work in public distribution system. The ration distribution system is automated by using embedded system technology, which is similar to the ATM. This automated ration system replaces the conventional ration card system by smart card. In addition, the finger print smart card is placed in the machine in order to check the correct user access. If the user is correct user, the next process takes place. As soon as the input is given, the products are obtained from the automated ration shop and the amount is taken from account of the particular person. The embedded controller is pre-programmed in such a way to perform the similar operations. In this automated ration shop government have control over all transaction that occurs in ration shop. In order to involve government in the process, 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. For the efficient operation and economic constraints of the system, the power supply unit is fully made alternate to solar power.

E. Construction

This smart ration distribution system mostly performed to reduce the corruption and reduce the wastage of time. Because in our system the goods are distributed automatically without any manpower.

Figure explains the basic module of automatic materials distribution and stock maintenance based on smart ration card technology. This system consists of the AVR Microcontroller, smart card, motor driver, LCD and GSM. The proposed system expresses sharing of grains as well as liquids.
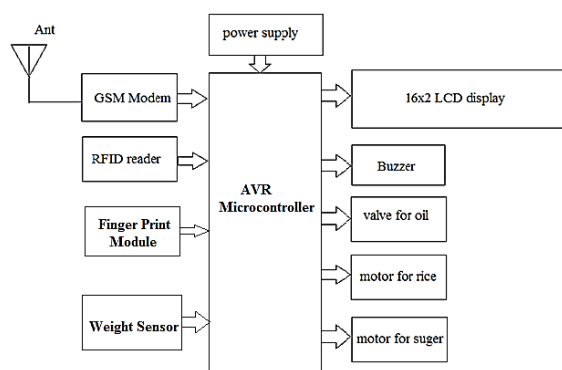

Fig 1. Block Diagram

"The block diagram of an Automatic Ration Materials Distribution Based on GSM and RFID Technology is shown in Figure 1. This system consists of various parts such as RFID, Finger print module, GSM, microcontroller, motor driver, solenoid control circuits and AVR microcontroller.

F. Components
ATmega2560

In this proposed system ATmega2560 Microcontroller is used. Figure 3.2 shows the Pin Diagram of ATmega 2560 Microcontroller.

Features
- High Performance, Low Power Atmel® AVR® 8-Bit Microcontroller
- Advanced RISC Architecture
- 135 Powerful Instructions
- Most Single Clock Cycle Execution
- 32×8 General Purpose Working Registers
- Up to 16 MIPS Throughput at 16MHz
- On-Chip 2-cycle Multiplier
- High Endurance Non-volatile Memory Segments
- 64K/128K/256KBytes of In-System Self-Programmable Flash
- 4Kbytes EEPROM
- 8Kbytes Internal SRAM

GSM Modem SIM900
GSM is a digital mobile telephony system. 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 or 1800 MHz frequency band. The GSM module is communicate the microcontroller with mobile phones through UART. To communicate over UART or USART, we just need three basic signals which are namely, RXD (receive), TXD (transmit), GND (common ground). GSM modem interfacing with microcontroller for SMS control of industrial equipments. The sending SMS through GSM modem when interfaced with microcontroller or PC is much simpler as compared with sending SMS through UART

BC547
The transistor BC547 is used as a driver transistor in this system to drive the motor. The relay is operated using this transistor.Figure3.4 shows the pin diagram and symbol of transistor BC547.

- The BC547 transistor is an NPN Epitaxial Silicon Transistor.
- The BC547 transistor is a general-purpose transistor in small plastic packages.
- It is used in general-purpose switching and amplification BC847/BC547 series 45 V, 100 mA NPN general-purpose transistors.
- Whenever base is high, then current starts flowing through base and emitter and after that only current will pass from collector to emitter

LED

LEDs are semiconductor devices are made out of silicon. When current passes through the LED, it emits photons as a byproduct. Normal light bulbs produce light by heating a metal filament until its white hot. LEDs present many advantages over traditional light sources including lower energy consumption, longer lifetime, improved robustness, smaller size and faster switching.

7805 (3 Terminal Voltage Regulator)

The LM7805 is three terminal positive regulators are available in the TO-220 - package and with several fixed output voltages, making them useful in a wide range of applications. This is used to make the stable voltage of +5V for circuits. Each type employs internal current limiting, thermal shut down and safe operating area protection, making it essentially indestructible. If adequate heat sinking is provided, they can deliver over 1A output current. Although designed primarily as fixed voltage regulators, More information please refer Data sheet 0f LM7805.

Radio Frequency Identification Reader (RFID Reader)

A radio frequency identification reader (RFID reader) is a device used to gather information from an RFID tag, which is used to track individual objects. Radio waves are used to transfer data from the tag to a reader. RFID is a technology similar in theory to bar codes.
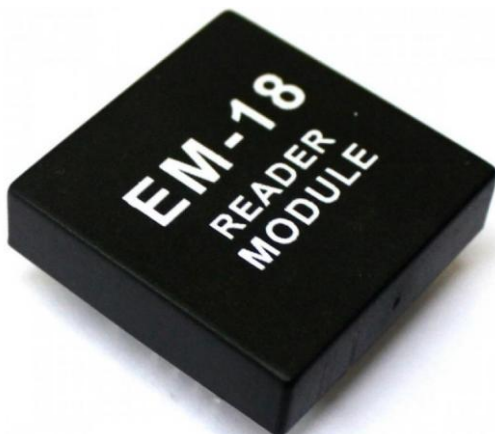

Fig 2. RFID Reader

Fig 3.RFID Reader Module Board

However, the RFID tag does not have to be scanned directly, nor does it require line-of-sight to a reader. The RFID tag it must be within the range of an RFID reader, which ranges from 3 to 300 feet, in order to be read. RFID technology allows several items to be quickly scanned and enables fast identification of a particular product, even when it is surrounded by several other items. RFID tags have not replaced bar codes because of their cost and the need to individually identify every item.

LCD 16x2

A liquid-crystal display (LCD) is a flat panel display, electronic visual display, or video display that uses the light modulating properties of liquid crystals. Liquid crystals do not emit light directly. The LCD is used in a wide range of applications including computer monitors, televisions, instrument, aircraft cockpit displays, and signage.

The most common in consumer devices such as video players, gaming devices, clocks, watches, calculators, and telephones, and have replaced cathode ray tube (CRT) displays in most applications. The LCD screen is more energy efficient than a CRT. The power consumption is very low while compare with other devices.

Finger Print Module

This is a finger print sensor module with TTL UART interface for direct connections to microcontroller UART or to PC through MAX232 / USB-Serial adapter. This is a finger print sensor module with TTL UART interface for direct connections to microcontroller UART or to PC through MAX232 / USB-Serial adapter.

The user can store the finger print data in the module and can configure it in 1:1 or 1: N mode for identifying the person. The FP module can directly interface with 3v3 or 5v Microcontroller.

A level converter (like MAX232) is required for interfacing with PC serial port. Optical biometric fingerprint reader with great features and can be embedded into a variety of end products, such as: access control, attendance, safety deposit box, car door locks.

G. Working

- In this proposed system when the ration of the peoples is send by govt.
- Then system will get activated in the ration shops, the particular user gets SMS on his mobile number about the ration send at PDS shops.
- Every user is provided by the smart card, the user have to come with smart card at the PDS shop.
- First he will scan the smart card by rfid scanner then the thumb impression will be verified.
- If the user is get validate the ration distribution system gets activated, on LCD display step by step the ration names is appears according to that the user will conduct his ration.
- At the end, user gets an acknowledgement through SMS regarding ration.

H. System Flowchart
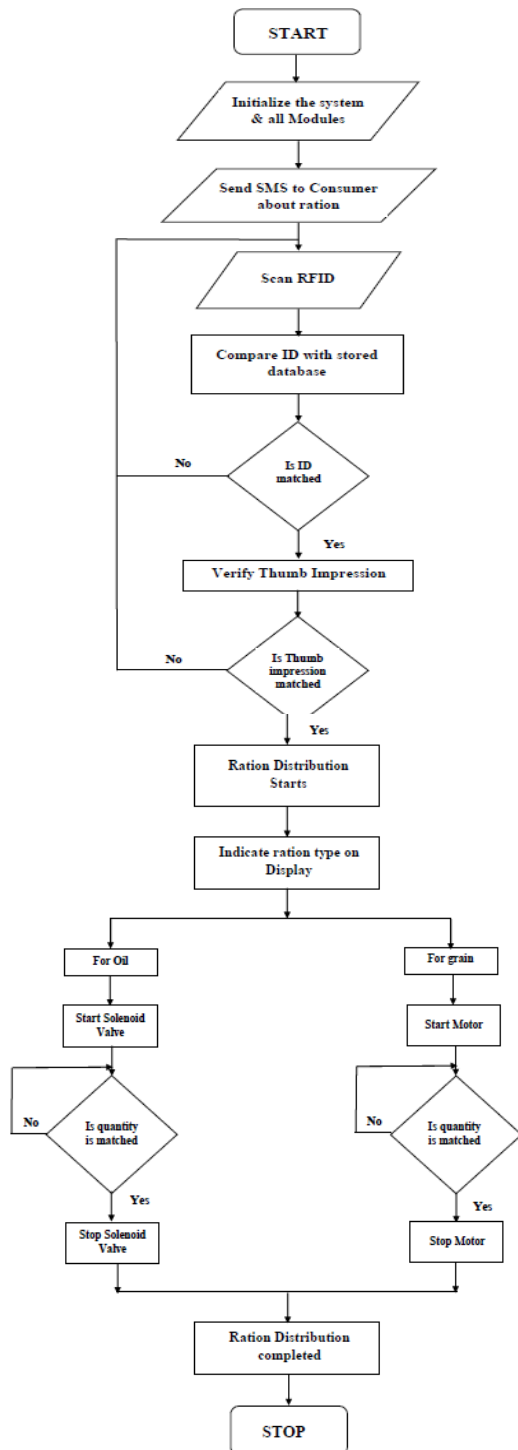The system flowchart is shown in figure below,

Fig 4. System Flowchart

CONCLUSION

In ration shop several drawbacks are there like material robbery, corruption, malpractices, long waiting time to collect materials, low processing speed. To overcome above problems the mechanized rationing scheme is needed. Here the automatic ration shop concerned smart card and controller for distributing the materials. At this time ration card is changed by smart card and send the stock details to government head office using GSM module. Here all the works are done automatically without any manpower. So this proposed system used to avoid the corruption, goods theft, forgery and also they reduce the user's waiting time. This system also suggested maintaining the stock details properly and updating the details easily. They provide a secure, safe and efficient way of fair price shops.

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