Automatic Rationing System using RFID and GSM Technology

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Abstract — **PDS is one of the widely controversial issues that involves corruption and illegal smuggling, mining of consumer goods. To elaborate, such malpractices often take place at the ration shop which involves manual work and there are no Hi-tech devices or gadgets to monitor such malpractices and curtail them. One of the main problems is that the license holder of that particular ration shop shows illegal or wrong entry to the Sales Tax Officer of the consumers goods which are being distributed among people. The second concern is that regarding the weight of the products that are given to the people, often altered by the negligent and cunning ration shop owner. Besides there are always problems caused to the "Flying Squads" to go through the ledgers, stocks available and the goods actually mentioned in the ledger and find out he irregularities. This is where our project proposes a way to automate all the above specified manual jobs i.e. everything from data entry, weighing of goods, pouring etc. is done by machinery devices and people won't be able to alter anything leading to complete transparency of a clear transaction. This in turn increases the reliability and brings a sense of faithfulness to consumers. Further all the data allocation and management is done by a computer, and it keeps a track of all data processes and system. Hence no mistakes and virtually all the manual works are abolished. The project consists of a RFID reader- a smart tamper proof ID distributed with ration card (intelligent ration cards) amongst all the consumers .The consumers here have to show cards to the reader and the reader communicates with the controller and thereby with the PC. The PC searches for all the data and information of the consumers in the data base (Cloud or data servers) like their photos, address, details of their family members. Further it finds out the exact amount of the quantity allocated to a given family and sends instruction to microcontroller accordingly. After customer buys some product then that customer will receive a SMS confirmation of his purchase. This is done by connecting a GSM module to the controller.**

Key words:- RFID, GSM, Raspberry Pi

1. INTRODUCTION

As mentioned earlier India's Public Distribution System (PDS) is largest retail system in the world and one of the most important aspect of our distribution system is Ration card. This Ration card helps people below poverty line to get some essential food products like rice, wheat kerosene etc. for relatively low amount as Compared to regular shops. The material is supplied to the shopkeeper in 1st week of every month.

Despite of having such good scheme for some people it has some disadvantages. The first disadvantage is that all the work is done by humans. Hence there is possibility of human errors while checking weight of some product. The consumer will not be able to identify some inaccuracy in this system and will not get full value for their money. Second disadvantage is that this

rationing system in our society has been very controversial over the past few years. Sometimes it is due to human errors but sometimes shop owners illegally uses consumer material without any knowledge to the ration card holders.

Thus our project introduces a system which will help to bring more transparency in this system. This project uses RFID tags and GSM modules for customer's service. RFID tags will be given to each ration card holder which will act as a key and the RFID receiver at the shop acts as a lock. Thus without prior knowledge of the consumer nobody will able to use the products available in the shop. Raspberry Pi controller will be used to control all these actions according to its program. Also there will be a GSM module which will give SMS confirmation to each of the consumer whenever something is brought using

their RFID tags. Hence misusing of RFID tags will also be avoided.

Hence this project will bring more transparency which will prevent any malpractices in the system and consumer as well as government will have all the information about total material imported and total materials sold because of GSM technology and the shop owners will not get opportunity to sell these products in any other way which will also help us to reduce corruption.

2. BLOCK DIAGRAM
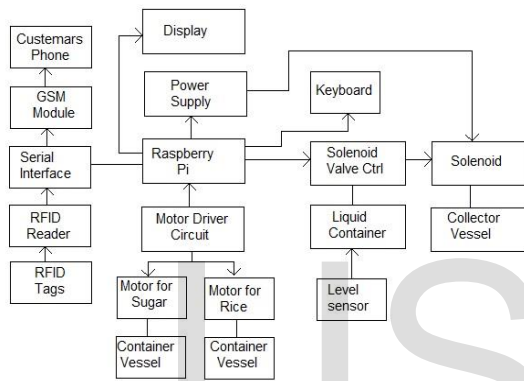
The above diagram represents system architecture of proposed system. It shows connections between all the components used in this system. The Raspberry Pi is the main controller of the system. It controls all the actions according to program. To dispense products like sugar or rice dc motors are used. As mentioned earlier the key to this system is the RFID tag. Whenever a customer scans it RFID tag, if the tag is recognized then it will ask to enter name of the product. It will give all the options available when the tag is scanned. A keyboard is interfaced with Raspberry Pi controller which will be used as an input device. The display will show all the available products and which key to be pressed for a particular item. Then when key is pressed keyboard gives signal to raspberry pi and corresponding motor gets on signal and product is dispensed into the container from where a customer can take it. For the liquid products like kerosene electronic valves are used. Whenever keyboard reads signal about any liquid product controller gives signal to solenoid valve controller. This solenoid valve controller will turn on or off the electronic valve and the liquid is collected into the vessel.

A GSM model is interfaced with the Raspberry Pi. Every customer's number and RFID tag no. is saved in a GSM model. So whenever a RFID card is scanned and any product is purchased the GSM module will send SMS for confirmation of the purchase. If a RFID tag is used by someone else then the owner of the tag will receive the confirmation message and if he hasn't purchased any product then he can complain to the government and misuse can be avoided.

Component Description:-

Radio-frequency identification (RFID) system is used which allows only authorized persons to get the material from the ration shop. An RFID consists of an antenna, a transceiver and a transponder electrically programed with unique information. Some of the most commonly used RFID kits are low-frequency (30-500khz), mid-frequency (900khz-1500khz) and high frequency (2.4-2.5Ghz). The GSM is used to send SMS to the customer as well as government authorized person for verification. To dispense any product motors are used along with motor drivers. For the dispense of liquid material electronic valves are used. These valves can be operated using solenoid valve controller. According to the signals received by valve controller from raspberry pi it will turn on or turn off the electronic valve. To show list of all available products. To enter which product to select a 4x3 matrix keyboard can be used. This will make it easy to give input to controller.

3. FLOW CHART
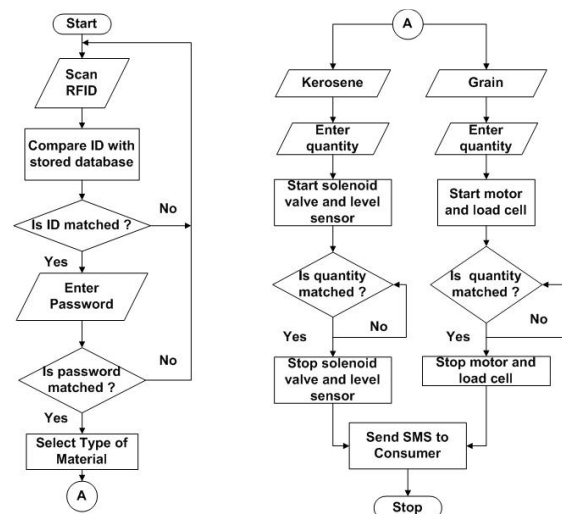
The diagram shown above is flow chart of the system. According to this flow chart Raspberry Pi will be programmed so that desired output can be obtained.

4. CONCLUSION

In this way, we are developing a system for smart and automatic ration distribution. Proposed system can provide safe, secure way for ration material distribution. Using this proposed modern system we can have better management of the ration distribution system. Govt. can have indirect check on the availability of the ration to the beneficiary. It will make the system transparent and beneficial for the society.

5. REFRENCES

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