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# Smart Rationing System By Using GSM And QR-code

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***Abstract:*** *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. In this paper, proposed an Automatic Ration Materials Distribution Based on GSM (Global System for Mobile) and QR-code on Aadhar card technology instead of ration cards. To get the materials in ration shops need to show the QR-code on Aadhar card and after QR-code scanning customer dialling password on keypad 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 they 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.*

***Index Terms—*** *Microcontroller, GSM, RFID, Motor, Solenoid Control Circuits, Mechanical Part*

**INTRODUCTION:**

In India the resources are finite, and desires are infinite, no one can have as much of a good as they desire. This means that the resources are scarce. This causes the need for a way to divide resources up among individuals, or rationing systems. So we are using public type Rationing System. The government and public own and share resources, and the government makes the decisions towards economic goals. Government often sets the price and allocates resources to produce the things that it thinks the country should produce. Public distribution system i.e. rationing distribution is one of the widely controversial issues that involves corruption and illegal smuggling of goods. All these happen because every job in the ration shop involves manual work and there are no specific high-tech technologies to automate the job. Because of intervention of manual work there are lots of illegal activity occurs. The illegal activities are like, wrong entry in register of shop about the amount of products that given to the people, sometimes there is chance of distribution of low quality products than actual product provided by government for poor people; people do not have idea about how much quantity of good provided by government to them etc. In this project we propose the concept about to replace manual work in public distribution system (rationing distribution system) by automated system which will be installing at the ration shop .In this automated system we replace the conventional ration card by an technique using character recognition of Aadhar card. Government should have control over all transaction happen at ration shop, to involve government in the process we can connect the system which is at ration shop to the government database via GSM module. In the existing system, normally, we use man power to distribute the Ration materials like sugar, Rice, Wheat Etc. It will take more time to give the people. And also the authorized person sell individual also. So, Corruption increases. The Planning Commission (2008) has estimated how much of the TPDS rice and wheat are leaked. Hence, more than half (54%) of the grain taken off for the TPDS disappeared before it reached buyers in the FPS. Moreover, the leakages have increased compared to 1993-94 and 1999- 2000, and are estimated at 28%. That about half the TPDS grains is leaked before reaching consumers reflects inefficiency, corruption and theft on a gigantic scale In our system we will remove man power to distribute the Ration materials like sugar, Rice, Wheat Etc. It will take less time to give the people and respective person can took any time like ATM machine. And also the authorized person cannot sell. We will have an automated rationing system. "Automation in rationing system" means distribution of essential commodities to a large number of people through a network on a recurring basis in an automated way. The Concept is to

automate the Public Distribution System (PDS), A Govt. Of India initiative Process in which a fixed amount of ration is provided monthly to the people by the PDS stores. Because of "Automation in rationing system" increased corruption in the market sector can be prevented. If system becomes automated, increased adulteration can be prevented as well, the hoarding done by the officials and laborers of Govt. Super Bazaars (PDS Stores) which in turn leads to price hike can be prevented using this system. The apparatus used for designing is cost effective and can prove helpful to Govt. of India's PDS System and to various other disciplines. In terms of feasibility it is a vast concept and an interesting task to perform and totally feasible in all aspects technical as well as other. Here, we are designing a system where a person displays his/her Aadhar card and our system gives the Ration to that user. Thus corruption is reduced.

## I. Related Works

The existing conventional 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 flashing 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 Proposed the "Automatic Ration Material Distributions Based on GSM and RFID Technology" [4]. Here each customer is provided with RFID cards. In this system, first user is authenticated, 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 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 et.al. Suggested the "Automatic Rationing for Public Distribution System (PDS) using RFID and GSM Module to Prevent Irregularities" [3], in this automated system conventional ration card is replaced by smartcard in which all the details about users are provided including their AADHAR number which is used for user authentication. To involve government in the process we proposed connecting the system at ration shop to a central database (provided by government.) via GSM and RS232. Hence it is possible to prevent the corruption and irregularities at ration shop. The existing PDS system causes overcrowding at ration shop due to manual work so S.Sukhumar et.al. 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. The current PDS having lack of visibility, Accessibility, and efficiency in the system so to these factors Mahammad Shafi et.al. 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 mechanism and its successful application in Computerization of food grain supply chain

## II. Proposed methods

### 3.1 Block Diagram

The block diagram of a Smart Rationing System By Using GSM is
shown in the Fig.1 this system consists of various parts such as GSM, microcontroller, motor driver, solenoid control circuits and keyboard.

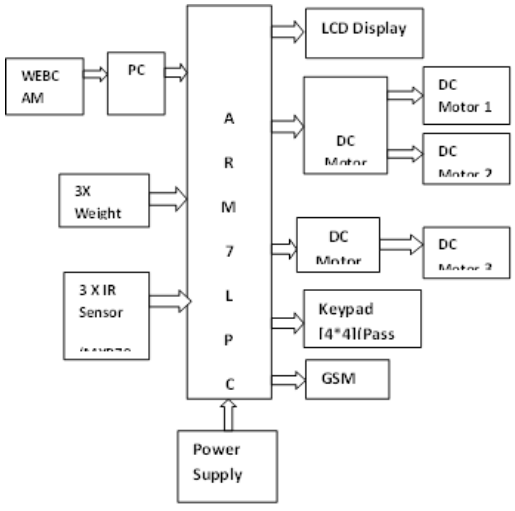


**Fig 1 : Block Diagram**

### 3.2 Power Supply Circuit Diagram

The power supply most important for electronic circuits, which is provide the required power to microcontroller and other electronics devices. The power supply circuit diagram is shown in the Fig. 2.

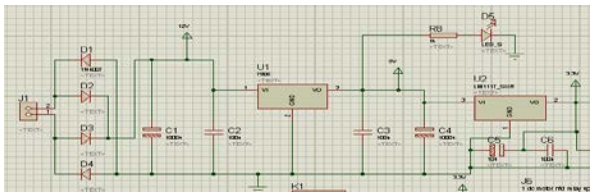

**Fig 2 : Power Supply**

### 3.3 Microcontroller Circuit

Microcontroller ARM-7 has flash memory. The programming of this microcontroller is very easy. It is used to interface with all interfaces as per our requirement.

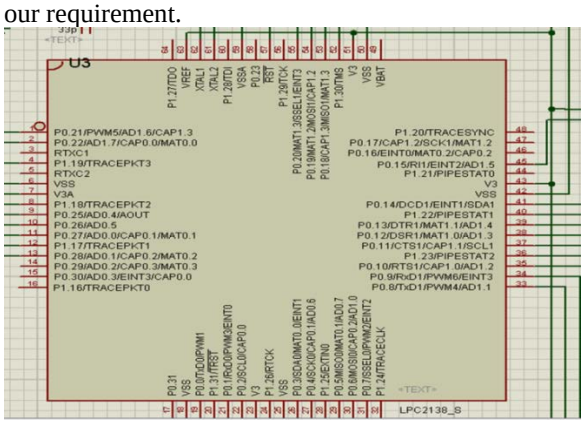


**Fig 3: Microcontroller Circuit**

### 3.4 QR-Code

QR Code embedded technique for invisible watermarking by using DFT compare with DWT. The DFT allows a QR Code image to be broken up into different frequency bands by using blocks DFT that comparison between low-band coefficients and the DWT that use Haar Wavelet Transform method hierarchically decompose a QR Code image into a series of successively lower frequency approximation sub band and their associated detail sub bands.Thitapa Poomvichid et has proposed audio based data hiding by applying the QR Code technique and using an AI technique achieved the quality of this technique was watermarked image and the Sim value of the extracted watermark after certain attacks will be poor.The inaudibility and robust performance can be achieved. Shanjun Zhan has proposed a robust method of embedding QR code into the DWT domain of divided blocks of the still image. This technique was embedded information and extracted correctly even if the images are compressed to less percentage of the original according to the contents of the images. Ray-Shine Run has proposed reliable SVD-based image watermarking. It was solving the ambiguities situation and the false positive problem and he gets the best PSNR value. The standard specifies 40 versions (sizes) of the QR code from the smallest 21x21 up to 177x177 modules in size. An advantage with QR code is also there relatively small size for a given amount of information The QR code is available in 40 different square sizes each with a user selectable error correction level in four steps (referred to as error correction level L, M, Q and H). With the highest level of error correction used up to ~30% of the code words can be damaged and still be restored. The maximum capacity for QR codes depending on the encoding scheme (using the lowest possible error correction overhead).

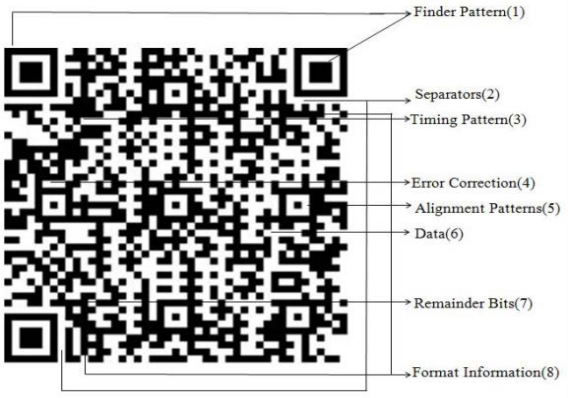


**Fig 4: QR-code**

### 3.5 RS 232

RS 232 is a serial communication cable used in the system. Here, the RS 232 provides the serial communication between the microcontroller and the outside world such as display, PC or Mobile etc. So it is a media used to communicate between microcontroller and PC.

### 3.6 CAMERA

The RS232 standard is used to interface the computer with the microcontroller. The computer is connected by the web camera for recognition. The MATLAB software window is used.

### 3.7 Dc Motor Driver (L293D)

The Device is a monolithic integrated high voltage, high current four channel driver designed to accept standard DTL or TTL logic levels and drive inductive loads (such as relays solenoids, DC and stepping motors) and switching power transistors. To simplify use as two bridges each pair of channels is equipped with an enable input. A separate supply input is provided for the logic, allowing operation at a lower voltage and internal clamp diodes are included. This device is suitable for use in switching applications at frequencies up to 5 kHz. The L293D is assembled in a 16 lead plastic package which has 4 center pins connected together and used for heat sinking The

L293DD is assembled in a 20 lead surface mount which has 8 center pins connected together and used for heat sinking.

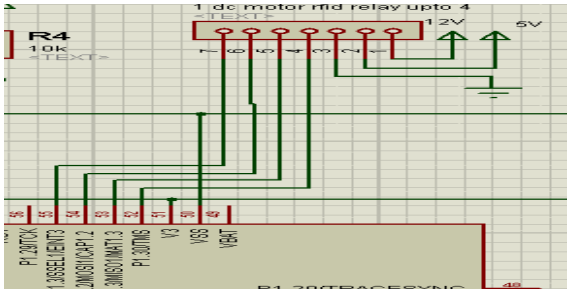


**Fig 7: DC Motor Driver**

### 3.8 GSM

GSM (Global System for Mobile communication) is a digital mobile telephony system. With the help of GSM module interfaced, we can send short text messages to the required authorities as per the application. GSM module is provided by SIM, uses the mobile service provider and send SMS to the respective authorities and the customer as per programmed. This technology enables the wireless system with no specified range limits. GSM uses a variation of time division multiple access (TDMA) and is the most widely used of the three digital wireless telephony technologies (TDMA, GSM, and CDMA). 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

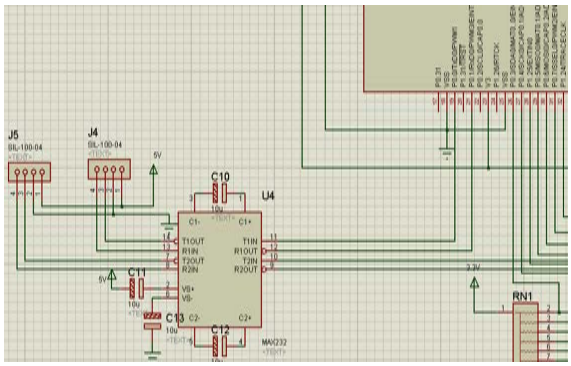


**Fig 8: GSM**

### 3.9 LCD Display

LCD is also used in our project to check the output of different modules interfaced with the microcontroller. Thus LCD plays a vital role in a project to see the output and to debug the system module wise in case of system failure in order to rectify the problem.

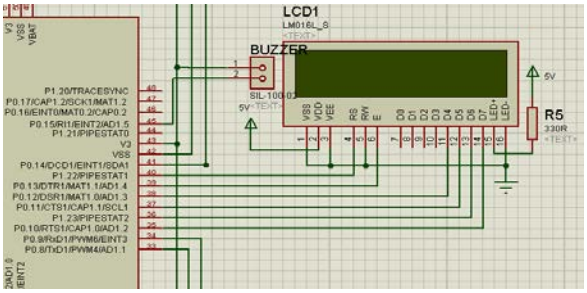


**Fig 9: LCD Display**

### 3.10 KEYPAD

Keypad is basically used to provide the input to the microcontroller. The keypad consists of micro switches which are connected to the microcontroller pins in a matrix format. Each key is assigned with the special character or symbol or digit. When user press the key the respective assigned ASCII value of that key is provided to the microcontroller via software. The keypad is also standard 4x4 which has 8 pin connector. The 4x4 keypad has the layout like the table shown below. BK is backspace while entering the password. EN is enter and is used do enable/disable menu item or enable the system.

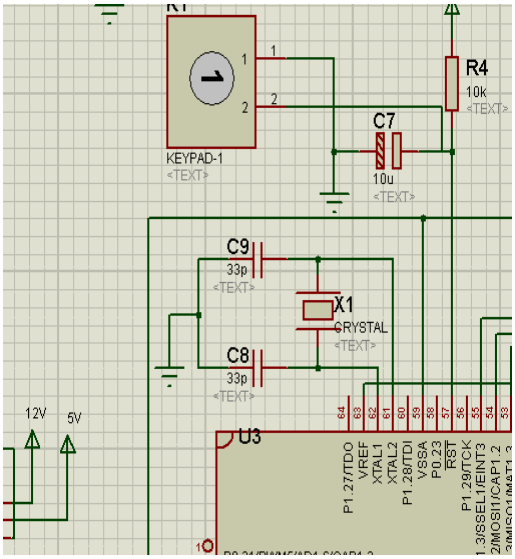


**Fig 10: Keypad**

## III. Result And Discussion

The Smart Rationing System by Using GSM and QR-Code used to distribute or vend the liquid or solid material, which is used for Ration materials distribution in ration shops. If the customer needs to get any ration material, the user has to show the QR-Code on Aadhar card that is incorporated with the project kit will recognize the QR-Code on Aadhar card show by the user. Each user will have a unique QR-code; this recognized QR-code on Aadhar card will be given to a microcontroller, which compared the input QR-code with the database. Before starting

the system, the unique QR-card on Aadhar 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 Aadhar 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 Aadhar 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 and Gov. about the ration item, he or she purchased. Before starting the process the amount of the item to be dispensed has to be calibrated separately then the only controller will dispense the correct quantity of ration item selected.

## IV. Conclusion

We have implemented and tested a Smart Rationing System by Using GSM and QR-Code on Aadhar cards. But in the existing 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 end of the month, they will sale to others without any intimation to the government and customers. The above drawbacks rectified by this method. In this system, ration Materials (sugar, rice, oil, kerosene, etc.) distributed through automatic mechanism without any help of humans. After receiving the materials, controller sends the information to government office and customer through GSM technology. This system is very accurate, simple and low power consumption, which is used for the real time applications.

## V. Acknowledgement

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We express our thanks for extending his support.Our deep sense of gratitude to **Prof. Ruchika Singh** the guide of the project for guiding and correcting various documents of ours with attention and care. She has taken pain to go through the project and make necessary correction as and when needed. We thank our Institution **G.S. Moze College Of Engg.** and our faculty members without whom this project would have been a distant reality. We also extend our heartfelt thanks to our family and well-wishers.

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