Smart Grain Dispenser with Officer Locking System

V.Barai[1*], N.Balla [2], C.Khobragade [3], S.Mahajan [4], Avinash Maurya [5]

[1]Electronics Design Technology, RCOEM- Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur, India
[2]Electronics Design Technology, RCOEM- Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur, India
[3]Electronics Design Technology, RCOEM- Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur, India
[4]Electronics Design Technology, RCOEM- Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur, India
[5]Electronics Department, RCOEM- Rashtrasant Tukdoji Maharaj Nagpur University, Nagpur, India

Corresponding Author: baraivishakha@gmail.com,   Tel.:+91 9404353950

Abstract— Every Indian Family issued ration card based on which given subsidized food grains are distributed. For distribution and storing of food grains, an effective smart approach is proposed in this paper. Due to manual distribution sometimes the user does not get actually measured food grains as it gets replaced with a poor quality of food grains. The main purpose of designing the system is to provide security for grains which are received from the government by the interfacing officer locking system. The proposed design provides ease of use to the customers. The presented system is offline as a database of user and officer is stored in memory according to the particular areas. The authentication is provided for the officer who loads the grains in a container and for the customer to receive the grains. Interchanging of food grains is prohibited after proper verification of identification number.

Keywords— Ration card, security, offline, verification.

I. INTRODUCTION

A government-sponsored chain of shops entrusted with work of distributing basic food and non-food commodities to the needy sections of the society at very cheap prices is called public distribution system. India's Public Distribution System has improved steadily during last 10 years. The system used to be most ineffective and corruption-ridden, with leakages of around 50 percent at a national level, going up to 80 or 90 percent in some status. The PDS covers at least 75 percent of rural households at the national level, rising to 80-90 percent in the poorest states. It has more than 4.8 lakhs shops, the largest retailer shops all over the world. It mainly targets 40 crore people with the monthly supply of subsidized food grains. It provides a supply of rice, wheat, kerosene but manually which has some of its drawbacks such as materials are robbed and are sold at high prices, also fake entries can be made. Due to this the processing speed is slow and the government is unable to meet needy people's requirements.

To overcome some of its discussed problems complete automation is done in public distribution system both at receiving end and at distributing end. Interfacing of memory and Arduino with its subunits is called user locking system. In this there will be two tanks of rice and wheat and locking system is designed at the lid of the tanks called as officer locking system. The presented system is offline and the of the user data is stored in the memory. Due to the inclusion of officer locking system will make it more protected and secured in terms of malpractices and theft as the access to the grains container loading is done by only one authorized officer.

The Smart Ration Distribution system with officer locking system will make it more efficient, reliable and cost-effective. Rest of the paper is organized as follows, Section I contains the introduction of traditional ration distribution systems and the briefing of the smart grain dispenser system with officer locking system, Section II contains the survey of related work, Section III contains the methodology for system, Section IV gives the results and discussion with flow chart, and the further Sections concludes research work with future directions

II. RELATED WORK

Smart grain dispenser with officer locking system substitutes the manual approach by providing protection to loaded grains and distributing the grain automatically. The database which is given by Government of a customer is stored in SD card according to particular areas.

"Automated ration distribution system using RFID and GSM" [2016]: The concept which is proposed in this research paper is based on RFID and GSM. The ration distribution system proposed is replacing the conventional

ration card method to RFID. As RFID has the unique identification number which is allotted to the user [1]. In addition, the efficient technique is used by providing authorized identification number i.e. password to the customer. If the password entered by a user is correct then the appropriate amount of grains start dispensing. In this, the GSM module is used for a transaction between user and Government. As the system proposed is offline it does not require GSM module to authorize with Government. In addition, the data of the customer is already stored in a memory card according to particular areas by the government. Noor Adiba, Piyus, Akash Kr. Singh.

"Auto rationing system" [2016]: The idea presented in a research paper in which the conventional card is replaced by user's thumb. The user database already stored in systems which include adhar number and other information. The thumb module is interfaced with the microcontroller AT89C52 and PC via MAX232. The government should have control over all transaction happen at ration shop, to involve government in the process we connected the system which is at ration shop to the government database via GSM module and MAX232[2]. In extension to this, the simple passkey is provided to the user to access the account more efficiently, it only requires elementary software resources. As thumb module can make mistakes with the dryness or dirty of the finger's skin, as well as with the age (is not appropriate with children, because the size of their fingerprint changes quickly). Prof. A. V. Kalaskar, Ms. Ashwini Mahalle, Ms. Radha Mahalle, Ms. Sonal Gase, Ms. Suvidha Dhoke, Ms. Sweety Bramhankar

"Automatic Rationing system using embedded system technology [2013]: The distribution system is automated by using PLC, which is similar to ATM. Replace conventional ration card system by the smart card. Fingerprint detector is placed in the machine to check correct user access. Proposed ration shop system is connected to government database via GSM module which sends updated information to government and costumer for efficient operation and economic constraints of system, power supply unit are fully made alternate to solar power [4]. In a proposed system in this paper is cost-effective. S.Sukhumar1, K.Gopinathan, S.Kalpanadevi, Naveenkumar, N.Suthanthira Vanitha.

"Ration vending machine using fingerprint recognition" [2017]: "The objective is to provide security to ration holder due to fingerprint recognition. Provide the proper amount of ration item with help of digital load sensor [3]. In this biometrics is used for security purpose. As this system is completely online which may create problems in rural areas as in some areas there may be a problem of network failure. Prof Jadish Patel, Mr.Deepak Mantala, Mr. Akshay Jain, Mr.Wabale Rushikesh.

III.   METHODOLOGY

In this project, we are using Arduino as main memory which is interfaced with its subunits in officer locking system and user locking system. In officer, the locking system is interfaced with servo motor, keypad, and LCD. In this keypad is acting as input which is used to enter a password by the officer in this four of the pins are connected to analog pins are another four are connected to digital pins. LCD is acting as output in which enable pin, reset pin and data pins are all connected to digital pins. Servo motor is for opening and closing of the flap in which PWM pin is connected to Arduino. In user locking system LCD, servo motor and keypad interfacing units are similar to that of officer locking system. In addition to that, a memory card reader is used to store data of users in which chip select, serial clock, MOSI, MISO pins are connected to digital pins of Arduino. Load Cell is interfaced with Arduino through HX711 data pin and serial clock pin of HX711 are connected to analog pins of Arduino.

## IV.   RESULTS AND DISCUSSION
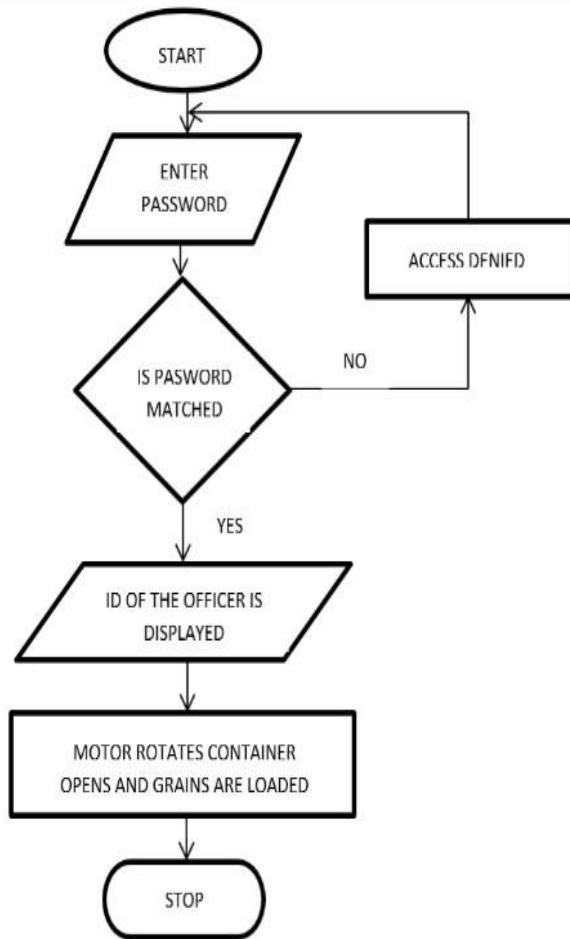
Fig. (1) Officer locking system

Fig (2) User Interfacing
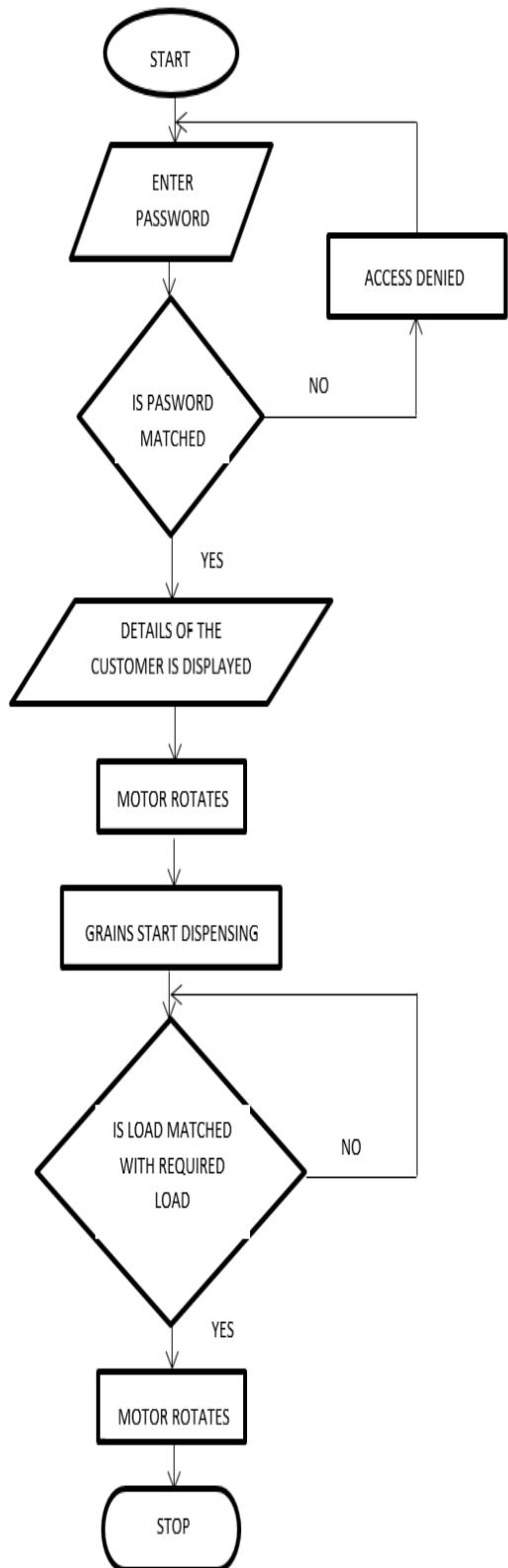
Performance Analysis:

The system has performance based on the various results displayed on the LCD.

1. System to be begin:

In this the system is being initialized and name of the project is displayed on the LCD.

2. Displaying the name of the system:

As there are two systems one is user locking system and other one is officer locking system. We have consider one system to display the appropriate message on the LCD i.e. Officer Locking System.

3. Entering the password:

In this system password is entered by the user whose database is already stored in the SD card.

4. Excepting the password:

When the password matches the password stored in database a particular message is displayed on the user screen.

5. Opening the container for loading grains:

When password is accepted by the system the container is open to load food grains.

6. Quantity Loaded:

When servo motor is displayed by 180 degrees phase shift, a message is displayed on LCD to load grains.

V. CONCLUSION AND FUTURE SCOPE

The proposed methodology is more reliable and efficient. This system is more secured and will curb various problems related to black marketing. Also, the entire system is offline thus it can be easily incorporated in rural as well as in urban areas. Due to the inclusion of officer locking system the adulteration of food grains is prevented. The customer will be able to get good food quality issued by the government. This system is completely automated and provides ease to solution for those problems which are faced by the traditional Public Distribution System. It reduces man power and increases the accuracy.

In addition to smart grain dispenser with officer locking system, for the future direction many features can be added. On Future enhancement the whole proposed system can be incorporated on an automobile vehicle in which grains can be distributed after visiting the user home by providing door to door service on monthly basis. Which will provide ease to customers who will receive their monthly ration at the their door. Distribution can only be done after user verification. This system will curb all sorts of drawbacks and fraud which are caused in public distribution system.

VI. REFERENCE

[1] N. Adiba, A.K. Singh, *"Automated ration distribution system using RFID and GSM"*, International Journal of Advanced Research in Computer Engineering & Technology (IJARCET), Volume 5, Issue 7. Pp.1-7, 2014

[2] C. Mahatme, S. Mahakalkar, *"Auto Rationing system"*, International Journal of Pure and Applied Research in Engineering and Technology (IJPRET), volume 4. Pp.1-7, 2014

[3] J. Patel, D. Mantala, *"Ration Vending machine using fingerprint recognition"*, International Journal of Advance Research and Innovative Ideas in Education (IJARIIE), Volume 3, Issue 2. pp.1-6, 2017

[4] P.Naveenkumar, N.Suthanthira Vanitha, *"Automatic Rationing system using embedded system Technology"*, International Journal of Innovative Research in Electrical, Electronics, Instrumentation and Control Engineering (IJIREEICE), volume 1, Issue 8 . pp.1-4, 2013

[5] M. Zagare, G. Bodade, *"Automatic Rationing system by using controller"*, International Journal of Research in Advent Technology (IJRAT). Pp.1-4, 2016

[6] P. Pedwal, *"Real Time Automatic Ration Material Distribution System"*, IOSR Journal of Computer Engineering (IOSR-JCE), pp.1-5, 2016

[7] Yuvaraju .M , Pranesh K.A., *"Fair Price Shop Automated Vending Machine Design Using RFID and GSM Communication Technology"*, International Journal for

Research in Applied Science & Engineering Technology (IJRASET), Volume 4, Issue 6, pp.1-8, 2016

[8] Kamalanathan .P, *"Automatic Paper Vending Machine"*, International Journal of Science, Engineering and Technology Research (IJSETR), Volume 4, Issue 4, pp.1-6, 2015

[9] S. Raikar M, G. D. Kamlapura, *"Automated Ration Wending Machine for a Ration Shop Using RFID Card"*, International Journal of Science and Research (IJSR), pp.1-5, 2015

[10] N. Adiba, S. Priyam, *"Automated Ration Distribution System Using RFID/UID and IoT"*, International Journal of Advance Electrical and Electronics Engineering (IJAEEE), pp.1-5, 2017

[11] Y.K. Sharma, K.B. Shiva Kumar, *"Multi-Modality Biometric Assisted Smart Card Based Ration Distribution System"*, International Journal of Application or Innovation in Engineering & Management (IJAIEM), Volume 4, Issue 6, pp.1-11, 2014

[12] P. Pedwal, S. Borkar, *"Real Time Automatic Ration Material Distribution System"*, International Journal of Computer Science and Mobile Computing (IJCSMC), Vol. 5, Issue. 3, pp.1-6, 2016

[13] K. Bogawar, N. Kayarkar, A. Biswas, *"Intelligent Rationing System using RFID &GSM"*, International Journal of Engineering Science and Computing(IJECS), Volume 7 Issue No.3, pp.1-3, 2017

[14] R.A. Jaid, C.K. Kadam, *"An Overview of Automatic Rationing System"*, International Journal of Informative & Futuristic Research (IJIFR), Vol. 2, Issue. 6, pp.1-6, 2015

Authors Profile

Vishakha Barai currently pursuing Bachelor of Engineering from university of Nagpur. She is doing her Bachelor of Engineering in Electronics Design Technology at Shri Ramdeobaba College of Engineering & Management, Nagpur. She had participated in ACCS – Arm Design Challenge 2017 presented by TVS motor company. She had done her Summer Internship from Ordnance Factory Ambajhri Nagpur. She has done her mini project on Autonomous Luggage Carrier System and "Distance Measurement using Ultrasonic Sensor using PIC microcontroller were her projects done in curriculum. She participated in Techfest, IIT BOMBAY and ABU Robocon. She participated in National paper presentation competition Ennovate 2017, RCOEM.

Nikita Balla currently pursuing Bachelor of Engineering from university of Nagpur. She is doing her Bachelor of Engineering in Electronics Design Technology at Shri Ramdeobaba College of Engineering & Management, Nagpur. She has done her mini project on Autonomous Luggage Carrier System. Electricity Generating Footwear Using "Piezoelectric Material" and "Counter Implementation Using PIC Microcontroller" are her projects done in curriculum. She participated in National paper presentation competition Ennovate 2017. She participated in ARM Design Challenge competition (ACCS) presented by TVS Motors. Participated in competition Escalade presented by IIT Guwahati.

Chetna Khobragade currently pursing Bachelor of Engineering from university of Nagpur. She is doing her Bachelor of Engineering in Electronics Design Technology at Shri Ramdeobaba College of Engineering & Management, Nagpur. She has done her mini project on Home Automation using Bluetooth module and Mobile App. "Water dispensing machine Using IR Sensor" and "Heartbeat Measurement Using PIC Microcontroller" are her projects done in curriculum. She participated in competition Autobot conducted by AXIS'16 VNIT, Nagpur.

Sushmita Mahajan currently pursing Bachelor of Engineering from university of Nagpur. She is doing her Bachelor of Engineering in Electronics Design Technology at Shri Ramdeobaba College of Engineering & Management, Nagpur. She has done her mini project on Hair dryer. FPGA Based implementation of Digital Stopwatch using "SSD" and "Interfacing keypad and Switch's Using PIC Microcontroller" are her projects done in curriculum. She participated in national level project, paper presentation & gaming competition in polytechnic 2015. She has done 1 Month Internship in Ordnance Factory Ambajhri Nagpur. She participated in ECD competition. And also she selected as Sports Secretary of EDT Department. She has 3 year Experience in Swimming as a coach.
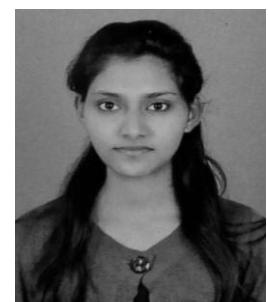
Avinash Kumar Maurya currently working as Assistant Professor in Electronic Engineering at Shri Rameobaba Collage of Engineering & Management. He received his UG degree in the Electronics Tele Communication from Government Engineering Collage Bilaspur under CSVTU University Chhattisgarh got PG degree in SGGSIE&T Nanded from SRTMU University Nanded in Instrumentation Engineering.