International Journal of Multidisciplinary Advent Research and Review (IJMARR)
Vol. 1, No. 3, April 2025
E-ISSN: 3049-1932
Available online at https://www.ijmarr.org/

Automatic Grains Dispensing System

Prof. S.D. Kale [1], Swapnil P. Chavhan [2], Gauri G. Gurnule [3], Atharv H. Bhaganagarkar[4], Rutika D. Dhavatode[5]
Assistant Professor[1], Student[2,3,4,5]
Department of Electronics & Telecommunication Engineering
Jagadambha College of Engineering & Technology, Yavatmal, Maharashtra, India

ABSTRACT - The Automatic Grain Dispensing System is an innovative solution designed to streamline the distribution of essential commodities such as grain and kerosene. This system ensures efficient, secure, and automated dispensing by integrating RFID technology and a password-based authentication system. When a user scans their designated master card, the system verifies their identity and displays the user details on an LCD screen. To enhance security, the system prompts the user to enter a password. Upon successful authentication, the automated mechanism precisely dispenses the required quantity of grain and kerosene without any manual intervention. This system is particularly beneficial for public distribution systems, enabling controlled and convenient access to resources. By minimizing human involvement, the Automatic Grain Dispensing System not only reduces waiting time and errors but also ensures an equitable distribution process.

KEYWORDS - Automation, Grain meting out, clever device, computerized Distribution, Automation era, Grain storage, Dispenser layout, Mechanized gadget, meals Distribution, green shelling out, automatic Mechanism

1. INTRODUCTION

India's Public Distribution system (PDS) is a critical social welfare program that seeks to address the meals safety desires Of millions of economically disadvantaged families. But, the conventional manual procedures and operational Inefficiencies inherent inside the PDS have impeded its effectiveness, resulting in leakages, corruption, and insufficient Welfare results.In recent years, there was a growing reputation of over the last few years, there has been an increasing acknowledgment of the ability of era-driven interventions to cope with these demanding situations and optimize The transport of crucial commodities to the meant beneficiaries. The automatic Ration Distribution gadget (ARDS) Represents a transformative technique that harnesses advanced technology, which includes biometric identity, cell programs, and actual-time information analytics, to automate and streamline the complete supply chain of vital commodities within the PDS. Through digitizing and automating the distribution method, ARDS objectives to lessen leakages, decorate Transparency, enhance operational performance, and make certain focused transport to the rightful beneficiaries. This literature survey paper conducts a comprehensive evaluation of the existing frame of research and scholarly works related to ARDS in India. Through an exhaustive evaluation of literature

resources, the paper aims to provide an in-intensity expertise of ARDS, its implementation, and its effect on the PDS. The paper explores and examines the key functions and additives of ARDS, along with using biometric identification systems for beneficiary authentication, cellular programs for registration and monitoring, and data analytics for optimizing distribution processes, further more, This paper critically evaluates the benefits and benefits of ARDS, along with its capability to lower corruption, enhance duty, enhance concentrated on accuracy, and streamline the general distribution machine. It additionally delves into the challenges and obstacles faced in the course of the implementation of ARDS, along with the want for strong technological infrastructure, information protection issues, the digital divide among beneficiaries, and the significance Of capacity building for stakeholders involved. By using consolidating and analysing the prevailing literature, this research Paper extensively contributes to the cutting-edge know-how base on ARDS in India's welfare atmosphere. The findings of This literature survey offer treasured insights for policymakers, researchers, and practitioners engaged inside the design, Implementation, and evaluation of ARDS tasks. This literature survey serves as a basis for destiny research

Public distribution machine presents food for the underneath poverty phase at low charge, which is distributed through the Indian government. Every circle of relatives is the use of this benefit as per the card. Distinctive meals grains like wheat, rice, finger millet and Sugar is fixed satisfactory for every month based totally on the full range of people in each family. The Indian government presenting unique facilities For bad humans by way of imparting ration. Because of more corruption in Ration distribution system such facilities do not attain up to bad human beings. Every circle of relatives had valid ration card to buy the commodities from the ration stores. This commodities is collected at once in every month at ration keep. The Commodities will allotted with the aid of shopkeeper thru the Weighting machine with the assist of human intervention. In such cases we can substantive drawbacks which human beings can suffers, first of all the inaccuracy in vague weighting of commodities because of human errors after which secondly, occasionally purchaser may pass over the commodities, such commodities will misuse by way of The shopkeeper whilst there may be no monitoring of such Commodities. Then the shopkeeper will promote the commodities inside the market and make a income with out intimation to authorities and clients. Shopkeeper acts as bridge between authorities and client. So in this proposed device we are trying to enhance the safety and decrease the corruption in the ration stores.

In this paper, the proposed mission "automatic Ration meting out system" ambitions to growth the safety to the device and decrease the corruption and above noted Drawbacks. On this mission the authorities officer have to provoke

The manner in place of shopkeeper via setting finger in finger Print sensor and if matches he gets person password to registered mobile quantity. Then shopkeeper can distribute ration to the client. On the time of initiate, officer updates the ration information data to the government server or portal. This gadget also removes the human intervention whilst imparting ration because of gadget is automated and all the dispensed commodities are up to date in the

government server. Some other technology used in the proposed task of This paper, is the extremely sonic sensor which facilitates to locate the Commodities degree inside the field. While the commodities become no inventory or empty within the container, the extremely sonic Sensor updates the fame to top off commodities. The government officer will top off the box each time whilst Commodities end up empty. To send a SMS to the authorities or to client we're using GSM (worldwide gadget FOR cellular)although the idea of entire automation has hit The enterprise, there is nonetheless lack in the manner how the new system is designed and integration of the identical With the prevailing machine to reap automation in part or absolutely. On thorough look at of the design requirements which may be viable and affordable as properly for the real time software of doling out device, the system is built additionally retaining in consideration of space constraints. This computerized dishing out system techniques and Dispenses the materials on call for of the Operator.

2. LITERATURE SURVEY

In recent years, automation has revolutionized various sectors, including agriculture and food distribution. The development of an Automatic Grain Dispensing System aligns with the need for efficient, user-friendly, and secure grain distribution processes, particularly in regions where food resources are controlled and distributed to beneficiaries through government or cooperative systems.

Several studies have focused on automated distribution systems aimed at reducing human intervention and improving transparency. According to Singh et al. (2019), automation in food distribution has streamlined inventory management, reduced waste, and minimized discrepancies in resource allocation. Their research highlighted the importance of user identification and secure transactions in automated systems, which can be enhanced by utilizing technologies such as Radio Frequency Identification (RFID) and Near Field Communication (NFC).

Kumar and Shah (2020) explored the use of RFID technology for beneficiary verification in automated dispensing systems. In their system, users scan a unique identification card that triggers a display of user details, allowing them to access resources. This study emphasized that card-based access enhances security, prevents unauthorized access, and ensures that only eligible users can dispense grain or other commodities.

Furthermore, Patil and Ramesh (2021) examined the integration of password-protected systems in public distributioln frameworks, showing that adding an extra layer of security via a password can significantly reduce misuse. Their work demonstrates how the combination of a master card scan and password authentication provides a two-factor verification process, enhancing the system's reliability. In this approach, after successful verification, the system autonomously dispenses the allotted grain or other resources, such as kerosene, directly to the user, improving efficiency and reducing human error.

3. EXISTING SYSTEM

In present scenario the client has to shop for ration the use of ration card from the ration stores. While get commodities from the ration save, client want to post the ration card and similarly sign within the ration card for file the details. In some ration keep rather than signal they'll affirm thru biometric process and quantity of ration will relies upon upon the ration card sorts. After the shopkeeper will problem the ration through weighting system with the help of human intervention. In such instances having drawbacks, first of all is weight of the commodities or grains can be inaccurate in amount due to human errors even as weighting the materials. 2d isn't always keeping data of distributed substances info in the ration save. The store keeper will entries fake or wrong information of allotted substances. Making earnings through selling materials on the market at high charge. Finger print is the final factor to sells the commodities or the cardboard holders. The present device of public distribution system works in a stage in which because the obligations are taken among kingdom and middle government. State government is chargeable for locating bad humans and offering centers to them. But central government is answerable for buying foods or grains at minimal price. The center government will decide the allocation of the material to the each state.

4. PROBLEMS IN THE EXISTING SYSTEM

The intention of this task is to offer extra transparency to the client and decrease the corruption. The government suffers corruption in gift state of affairs like ration forgery, black advertising etc. The most important drawback is that the weight of the materials can be faulty because of human errors and there is no transparency about ration cloth distribution. This proposed gadget enables to reduce the corruption and the commodities will attain to the needy humans correctly. Distributed commodities will update in government portal in time to time manner after doling out substances.

5. PROPOSED SYSTEM

1.Block diagram

The block diagram automated Ration material as shown in figure.

Power is provided to the microcontroller and module by the adapter circuit. AC power adapters are typically used with electronic devices that need power but do not have the internal devices to draw the required voltage and power from the power source.

The mains power supply is too high and is not suitable for the electronic equipment. The adapter circuit steps the voltage down to the appropriate level. The purpose of the bridge rectifier is to rectify the step-down AC input. A reservoir or smoothing capacitor is placed at the output of the rectifier.

It essentially releases the stored energy when the output of the rectifier is not receiving voltage. This output is fed to the IC7812, a 12V regulator that can provide up to 1 amp.

2.System Design and Components Selection

• Microcontroller: Choose a microcontroller, such as Arduino or Raspberry Pi, as the core processor to control the entire system.

• RFID Reader: Use an RFID reader module to scan the master card. This module will identify authorized users by reading RFID tags and relaying the data to the microcontroller.

• Display Screen: Integrate an LCD or LED display to show user details and system messages.

• Keypad Module: Attach a keypad for password entry. The keypad will enable users to enter a password after the card is scanned.

• Grain Dispenser Mechanism: Set up an automated grain dispensing mechanism using a DC motor and a storage container. Control the motor with the microcontroller to dispense the correct amount of grain.

• Kerosene Dispensing Mechanism: Install a separate motorized pump for kerosene dispensing. The microcontroller will control the pump to measure and dispense the required amount of kerosene.

3.Programming the Microcontroller

- RFID Scanning: Write code to detect and validate the RFID tags scanned by the RFID reader. Store the master card ID(s) in the system to allow only authorized users.
- User Authentication: After a successful scan, display user details on the screen and Prompt for a password. Program the microcontroller to accept and validate the password input.
- Grain Dispensing Logic: Upon correct password entry, the microcontroller activates the Grain dispenser. Code the system to dispense a predefined quantity of grain based on user input or default settings.
- Kerosene Dispensing Logic: Similarly, control the kerosene pump to release the required amount of kerosene. Include safety checks and stop functions to prevent over dispensing.
- Display and Feedback: Program the display to show real-time feedback for the user, including authentication status, dispensing progress, and completion messages.

4. System Integration and Testing

- RFID and Display Testing: Test the RFID reader for accurate user identification. Ensure the display correctly shows user details and prompts the password request.
- Password Validation: Check the password validation process for security and accuracy. Make sure the system only proceeds with dispensing after successful password entry.

- Dispensing Mechanism Calibration: Calibrate the grain and kerosene dispensing mechanisms to ensure precise quantities are dispensed. Adjust motor speeds and timings to optimize accuracy.
- Error Handling: Add error handling in the code for issues such as incorrect password attempts, unauthorized card scans, or mechanical failures in the dispensing process.

5.User Interface Development

- Design a clear and user-friendly interface on the display for ease of interaction.
- Display prompts and messages, such as "Scan Your Card," "Enter Password," "Dispensing Grain," "Dispensing Kerosene," and "Transaction Complete."
- Include feedback for incorrect entries or alerts for system errors.

6. System Operation Work flow

- Step 1: The user scans their RFID master card
- Step 2: The system verifies the card, displays the user's details, and prompts for a password.
- Step 3: The user enters the password on the keypad.
- Step 4: Upon correct password entry, the system activates the grain dispenser to release a specific amount.
- Step 5: After grain dispensing, the kerosene dispensing mechanism is activated, Providing the required quantity.
- Step 6: The system then confirms the transaction completion and displays a success message on the screen.

7. Final Testing and Validation

- Perform end-to-end testing with multiple test cases for different users and scenarios, Including:

1. Authorized user with correct password
2. Unauthorized card scans
3. Incorrect password entries
4. System reset in case of mechanical or electronic errors

6. ADVANTAGES OF THE PROPOSED SYSTEM

1. Reduces manual errors in dispensing.
2. Increases transparency and accountability.
3. Enhances security with RFID and password protection.
4. Minimizes the risk of theft and misuse.

7. DESIGN

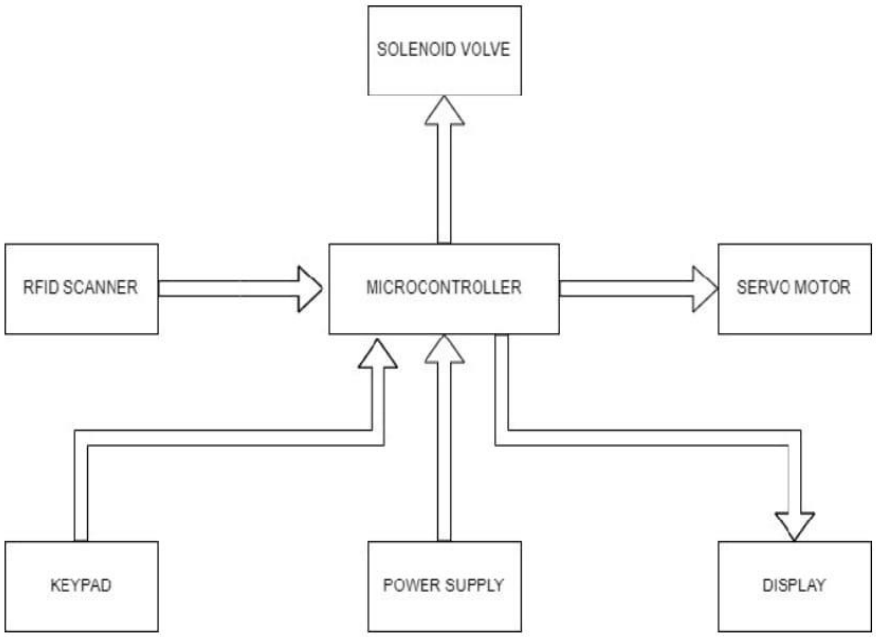

Fig 1: Block Diagram

8. RESULT

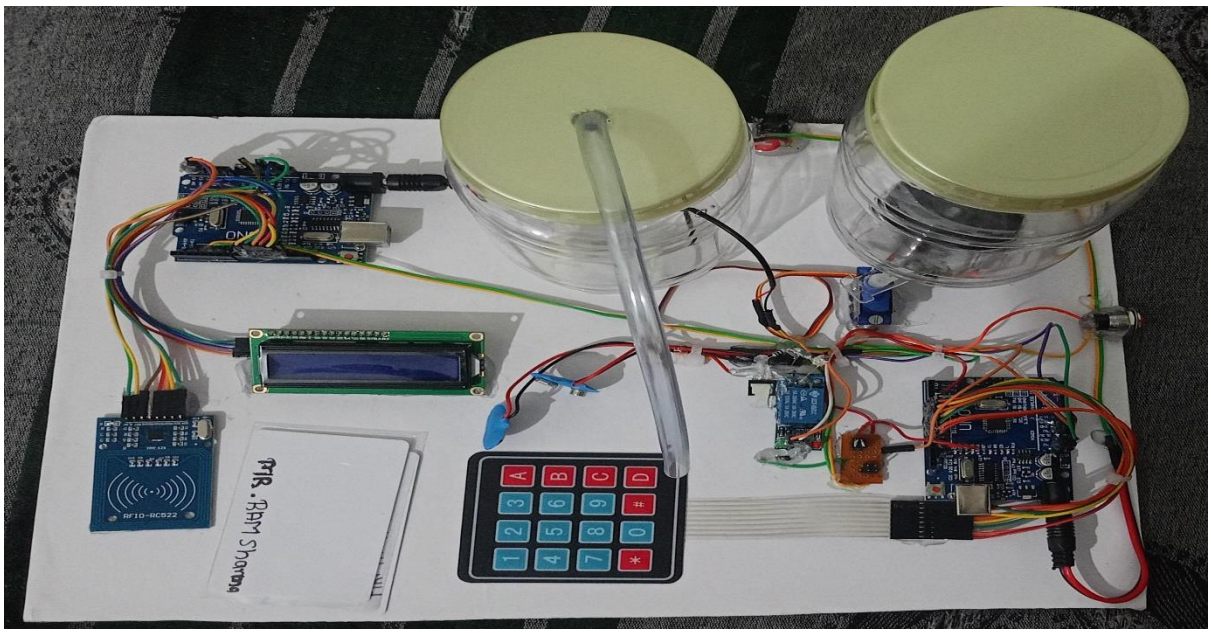

Fig 2: Resulting image of automated grain dispensing system

9. CONCLUSION

In this paper we've got proposed system automated ration meting out device model. In the gift existing system the ration distribution machine, there may be a downside of ration forgery. The ration distributor corrupting a food grain or ration cloth all through ration distribution. In our undertaking we're replaced the manual entries and consequently inside the way we are capable of reduce forgery, as we are used master key, and finger print module and OTP. In which the rice is shipped through automatic mechanism with out hard work. Every other drawback is ration details of the disbursed substances to the patron and getting into fake or wrong information will up to date to the authorities by way of shopkeeper. It is able to be triumph over with grasp key method. Accordingly we have made our machine in this type of manner that it's going to send allotted details to the users registered mobile variety and additionally to the general public distribution device government via GSM.

10. FUTURE SCOPE:

In addition to being introduced to this specific sector, the use of this particular improvement in the current operation of the ration shops has a lot of potential in numerous other domains. This specific method can be expanded to include several objects that can be chosen from a single controller. Additionally, the new technology can be utilised in a variety of locations, such as supermarkets and shopping centres. It can eliminate time constraints for a variety of applications because to its accessibility. Thus, users are available around-the-clock. Some businesses may decide to install such a system if it turns out to be profitable.

REFERENCES:

[1] M.Vimala, P.Thamaraiselvi "Aadhar Enable Automatic ration Distribution system using GSM and Fingerprint" in International Journal of Engineering science and computing, Vol. 9, Issue 3, pp. 20705-20706, March 2019.
[2] M.S.Manivannan, DR.P.Kanan, DR.M.Karthikeyan "Fully Automated Rationshop Monitering system", in IJARTEET, Vol. 3, Issue 3, ISSN 2394-3377, pp. 254-259, April 2016.
[3] Swapnil R.Kurkute, Chetan Medhe "Automatic ration distribution system", in International Conferencing on computing for Sustainable Global Development, Vol. 1, issue 3, ISSN 3805-4421, pp.11-13, April 2016.
[4] Rutuja Crorapwar, Anufa Bhargude, Smita craikwad,Sneha Zagade, Prof.G.S,Bhange "Smart automatic Rationing System", in International Journal Of Innovative Research In Science, Engineering and Technology, Vol. 8, Issue 1, ISSN 2319-8753, pp. 71-74, January 2019.
[5] Reshma Arote, Komal Nawak, Monika Shide, Prof.P.A Bansode, Prof,V.B Bhamare "Smart Rationing System using Aadhar Card", in International Journal of innovative research in

Computer and Communication Engineering, Vol. 6, Issue 3, ISSN 2320-9801, pp. 1949-1954, March 2018.

[6] Aarti Bhosale, Shweta Bhor, Pratima Scabale, Pushpak Shinde, ”Survey on Smart Ration card using Internet Of Things”, in International Journal of Computer Aplications, Vol. 180, Issue 3, ISSN 8975-8887, pp. 1-2, December 2017.

[7] J Deepa, Dr A Rijuvana Begum “RFID Based Ration Material Distributions without Human intervention”, in International Journal of Latest Research in Engineering And Technology (ISLRET), Vol. 3, Issue 10, ISSN 2454-5031, pp. 91-96, October 2017.

[8] Kashinath Curkade, Pankaj Chidrawar, Dinesh Aitwade, “Smart Ration Distribution and controlling”, in International Journal of Scientific and Research Publication, Vol. 5, Issue 4, ISSN 2250-3153, pp. 1-4 , April 2015.

[9] Rita R Chaudhari, Shraddha R, Parashar, Prof M R Dhotre “Design of Ration Distribution System to Stop the corruption using AVR”, in International Journal of Advanced Research in Computer and Communication Engineering, Vol. 6, Issue 2, ISSN 2319-5940, pp. 333-336, February 2017.

[10][10] Pranjal Pedwal, “Real time Automatic Ration Material distribution System”, in IOSR Journal of Computer Engineering (IOSR-JCE), Vol. 4, ISSN 2278-0661, pp. 05-06, June 2016.