

Automatic Ration Vending Machine Using Rfid

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Abstract:

In recent years, the automatic ration vending machine using RFID has become increasingly popular in many countries. The machine uses RFID to automatically identify and vend ration to the user. This paper presents the creation and execution of an automatic ration vending machine using RFID. The machine is designed to work with any type of ration and can be used in a variety of settings such as schools, hospitals, and office buildings. The machine is easy to use and can be operated by anyone. The machine is also very reliable and has a high degree of accuracy.

The consumer must first hit the number of his or her own card before tagging the card. He may withdraw a certain amount of ration if the number that was pressed and the card information match. The consumer cannot withdraw the ration if he is still an illegal user on that card if the pressed number and the card data do not match. Thus, avoiding the illegal withdrawal of the ration from an unauthorized person.

This study examines automated ration dispensing devices. The main goal of the automated ration vending machine is to prevent the massive financial waste that occurs with traditional ration distribution systems. In this approach, an RFID tag is utilized as an electronic ration in place of a card traditional ration card. To purchase ration from the dealer, the consumer must use his unique card in place of the regular ration card.

Keywords: Ration, RFID, Arduino, Ration Card, Automation

I.1 Introduction

The traditional public distribution system (PDS) the government give free or at minimum price ration to the public of the that country. This ration distributed to public by the ration shops which are present in every locality. The government give ration like sugar, rice, oil, kerosene, and many more at cheap price chosen by administration of that country. The prices and thing also depend on the colour of the card, as government has set the colour of the card according to income of that family like there are white card is given to family whose income is above the poverty line and the blue or orange card is given to the family which below the poverty line [1]. But in this system when some person didn't clam there ration this ration shop owner sell this without letting know to the government and making their own profit. Sometimes this ration card owners don't sell the items which were given to them or sometimes they

use the faulty weighing scale to make their profit. Due to all this 55% of ration does not reach to people [4]. At the time of covid 19 pandemic there were long line for this ration as people were not able to go out for work and earn. So, this ration food was very important to them and at time also this ration shop owner was doing the business of scamming the people. The main problem in this is 1) no database on stock availability 2) many malpractices and corruption.

In order to solve this issue, an RFID-enabled automated ration vending machine was created. The citizens will receive an RFID tag in this those functions similarly to their ration card. Information about the person's family and the amount of ration allotted to them with the pricing will be listed on this tag. A person must enter his identification number when he approaches a vending machine and then touch his RFID card on the RFID reader. When the RFID tag and identification number match, it will display the person's assigned ration and allow him to consume it, including items like rice, wheat, dals, sugar, etc. Since there is no fraud in this system, it is more trustworthy than the standard PDS method[7].

PROBLEM STATEMENT:

2. Problem Statement

The main problem that the paper addresses is the current inefficiency in the system of food distribution for people. This inefficiency manifests in several ways: long lines at food distribution points, irregular food distribution schedule, and lack of variety in food items. Here I have developed an automated ration vending machine (RFID) that would help to alleviate some of these inefficiencies. This machine would be stationed at food distribution points and would dispense the ration according to the ration details. In addition, the machine would be able to keep track of the food items in distributed, which would help to ensure that food is distributed properly and there is no malpractice in it.

The current PDS system in India offers nearly 1 billion people gains at a cheap price. In the traditional rationing system, there is a risk of illicit product consumption; materials may be stolen by entering incorrect entries made in the register without the ration card holder's knowledge. As a result, a significant quantity of money provided by the government is squandered. Apart from these low processing speed, high waiting time are major drawbacks of the traditional system. Considering the current scenario of the pandemic and economic disturbance within the country, the government cannot afford corruption and money squandering.

III. LITERATURE SURVEY:

An automatic ration vending machine is a vending machine that dispenses food items, typically in the form of a can or a packet, in response to a customer's selection of an appropriate item. Ration vending machines are commonly found in every sector of the country. They are small shops which help to give the ration to people at the cheap price as compare to normal price which is very high right now due inflection.

There are several benefits to using automatic ration vending machines. First, they can provide a quick and convenient way for people to obtain food items, especially when they are on the go. Second, they can help to reduce food waste by ensuring that only the desired amount of food is dispensed. Third, they can provide a consistent and reliable source of food items.[11]

As per government tenets and control, it is obligatory to the customer to create a legitimate apportion card to buy any materials from the administration proportion dissemination organization. Directly the apportion circulation process depends on the month-to-month conveyance design. Thus, the stock check is just done toward the month's end. It demonstrates the lacuna for day by day checking of unused or parity apportion material at the conveyance focus [3].

Ordinarily it has been seen that purchasers won't get the best possible amount of material even in the wake of paying full instalment. It is because of ill-advised alignment of estimating instruments. The third issue in which it has been seen that Government of India dependably endeavour to give and appropriate the material with least expense [2].

The expense of material is relying on different elements. This is to be refreshed and pursued by the merchant for dispersion of apportion material, however it isn't occurred really. In this paper the arrangement on all the above expressed issues of the manual dispersion system is concentrated and relative automated ration vending system is proposed. The issues can be given if the dispersion system will a robotized system in which it ought to relate to government workplaces, distributors, the proportion card holders for refreshing the stock at wholesaler. This programmed methodology of conveyance through atomization in the dispersion framework will be another methodology in modernization. have given the detail thought of the proportion material dissemination framework yet it was only a fundamental starting module.

The Arduino is the main brain of the system which controls the working of all components. Which is powered by microchip ATmega328p microcontroller. The input to arduino is from the power supply, RFID reader, keypad. The output from arduino is shown on LCD display, store the data to database and to relay to control the action of motor to distribute the grain. Arduino collects the data from the RFID receiver and checks the data is present in data if the data is correct then it will pass message to LCD display to show the person about its allotted ration. After that it will give signal to motor to disburse the ration one by one to person. After that it will send a message to LCD display to show the ration has been delivered. If the data is not correct, then it will show the message "unauthorized person".

The power supply is where the process begins, +5 V supply is given from the power supply block to the Arduino. Arduino then gives signal to the database where all the information of the users is stored. The relay unit is attached to Arduino to bypass the motor supply. The motor is used to trigger the Arduino circuit. The LCD is attached to the Arduino to display the Name of the customer, amount if ration issued and in the end the Thank you message is displayed. The Key pad is attached to the Arduino to check the authentication of the user. The key is already provided to the user and when the user comes to the ration store, the key is used to retrieve the information of the user. Once the information is retrieved the ration is given the consumer. The RFID is similar to Ration Card. The RFID consists of user information and their family information. Once the RFID is tapped the information is shown on the LCD Display. The RFID is scanned using an RFID reader[5].

V. COMPONENTS SURVEY:

a) ARDUINO UNO:

The ATmega328P serves as the foundation for the Arduino UNO microcontroller board. It has 14 digital input/output pins, six of which may be used as PWM outputs, as well as six analogue inputs, a USB port, a power connection, an ICSP header, and a reset button. Everything required to support the microcontroller is included; all that is required to get going is the insertion of a USB cable, an AC-to-DC converter, or a battery.



b) RFID MODULE:

A tool used to read and write data to an RFID tag is called an RFID module. RFID tags are used to store information about an object, and RFID modules are used to read and write this information. A little gadget called a radio-frequency identification (RFID) module is used to read and write data from RFID tags. RFID modules typically operate in the ultra-high frequency (UHF) range and can be used to communicate with tags from a few centimeters to several meters away. RFID Module

is an integrated circuit that is used to process and store information about an RFID tag. RFID Module is usually used in conjunction with an RFID reader. RFID Module typically consists of an input/output (I/O) circuit, a memory, and a CPU[6-8].



c) SERVO MOTOR:

An electromechanical device called a servo motor uses electrical energy to create torque and rotate an object at a given angle. Servo motors are commonly used in radio-controlled airplanes and boats, as well as in industrial automation applications such as robotics and computer-numerical controlled (CNC) machines. Servo motors are classified according to their power output and torque. The most common type of servo motor is the DC servo motor, which is powered by a DC voltage source. DC servo motors are used in applications where speed and torque control are required. AC servo motors are powered by an AC voltage source and are used in applications where precision positioning is required. Power, ground, and control are normally the three wires found on servo motors. Typically, the power wire is red, the ground wire is black, and the control wire is white. The control wire is used to send a signal from a controller to the servo motor that tells the motor what position to move to. Servo motors are typically to regulate, a pulse-width modulation (PWM) signal is employed. A PWM signal is a type of digital signal that consists of square wave pulses. The width of the pulses determines the position of the servo motor.



d) 16X2 LCD DISPLAY:

With a 16x2 LCD, there are 2 lines that can each display 16 characters. Each character on this LCD is presented in a 5x7 pixel matrix. 224 distinct letters and symbols may be shown on the 16 x 2 intelligent alphanumeric dot matrix display. LCD DISPLAY in this project used to display the details of customer

stock or less balance than entered, then it will display "Transaction Failed".

The system will work as follows:

1. The user will press their authentication key.
2. They will then tap the RFID card on the machine.
3. If the authentication key and the card details match, the machine will show the person the new ration.
4. The person can then select the ration they want.
5. The machine will give the signal to the motor of that ration storage.
6. After giving the allocation, the machine will show a "Thank You" message on the display.

a) ADVANTAGES

- 1) Reduces paperwork and is quite accurate.
- 2) Decreases ration shop material theft.
- 3) Removing personnel.
- 4) In order to track and safeguard the user database, it makes use of cutting-edge memory chip technology.
- 5) It eliminates terminology like illicit use, ration card theft, and crowded areas. Automation of PDS and digitized it.

b) DISADVANTAGES

- 1) Only the most basic information about a person, such as the card's validity, a list of family members, its kind, etc., may be carried by an RFID card-based system.
- 2) The price of tag is high and when deploy for large scale then it can be problem.[10]

VII. RESULT:



Here we can see the working model which was produced to show the working of the actual model. Here we can see the basic components like arduino uno, servo motor, RFID reader, LCD display and keypad. Here when we put the authentication code and tap the card it showed the correct detail on the led display and then it dispenses the right amount of ration. After dispensing the ration, it also shows "thank you" message also.

VIII. FUTURE SCOPE:

The future of automated ration vending machines is looking bright. The machines are becoming increasingly popular in many parts of the world, particularly in developing countries. They offer a convenient and affordable way for people to access food and other essential items.

There are many reasons why automated ration vending machines are becoming more popular. One of the main reasons is that they offer a convenient way for people to access food and other essential items. They are also becoming more affordable as the technology behind them improves. In the future, automated ration vending machines are likely to become even more popular.

They will become more widespread and more affordable, making them accessible to even more people. They are also likely to become more sophisticated, offering a wider range of products and services.[9]

IX. CONCLUSION:

In the current public distribution system, there are many drawbacks. First, automated ration distribution ensures that everyone in the household receives an equal share of the ration. This is not always possible with manual distribution, which can lead to conflict within the household. Second, automated ration distribution eliminates the need for people to queue up for their ration. This can save a lot of time, particularly in communities where queues are often very long. Third, automated ration distribution reduces the chances of ration being stolen or lost. This is because the ration is dispensed directly into the person's ration card, which they then take home with them. Fourth, automated ration distribution is more hygienic than manual distribution, as it reduces the chances of contamination. Fifth, there will be no selling of the products in the black market as it is more common with manual distribution system. And finally, automated ration distribution is more cost-effective than manual distribution, as it eliminates the need for manpower to distribute the ration. By preventing corruption, this study project will significantly alter the public distribution system and benefit the government. We can control the distribution of rations better with the help of this contemporary system.

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