

Aadhar-based Smart Ration Distribution

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ABSTRACT: Supply of adequate ration or food grains has been a major concern in our country from many decades. Improper measurement techniques, hoarding, black marketing, etc. have been the main reason for supplying food grains in an improper manner. The poor and tribal people have to be benefitted with the offers of the Government. But the government of Uttar Pradesh has admitted recently that food grain was diverted to the open market in the last three months through fraud transactions through the PDS scam. The people below poverty line are affected the most because of corruption and poor monitoring of grocery supply. Our project tries to overcome all the limitations caused due to the previous solutions.

Key Words: AADHAR/ Aadhar, ration, food grains, public distribution system (PDS), QR code.

Index Terms - Introduction, Methodology, System Architecture, Future Scope.

I. INTRODUCTION

Our countries food department has been working to supply food & oils to each and every citizen with the help of ration and grocery shops. But, many poor people have not yet received ration of adequate quality and quantity due to hoarding, black marketing, and many other reasons. Due to these reasons, a Smart Ration Distribution System is required to ensure proper distribution of food grains (less parched, e.g. wheat and rice), and other basic necessities to all the needy people[1].

II. PROBLEM STATEMENT

The present system uses manual methods of distribution of ration commodities like sugar, rice, wheat, etc. These manual techniques will take more time to give ration to the people. In the initial phase of the project, a database has been created to enter the details of the smart card holders, with the facility of updating and deleting the customer details. Then, in the later phase, we have interfaced the components to Arduino Uno board to make this system work more efficiently.

Also, there have been many complaints lounged about the shopkeepers not providing adequate amount of food grains (less parched, e.g. wheat, rice) to people, as he looks to hoard the ration and sell them at higher prices when their need will be more.

III. OBJECTIVES OF THIS PROJECT

The two main objectives of this project are-

- to create transparency in public distribution system, and

- to inform the people about the new schemes launch by the government.

IV. PROPOSED WORK

Aadhar card consists of QR code, encoded with Aadhar number. The details of a user will be added using an android application. The details will be stored and recorded as it is entered using a database. It will also be responsible for maintaining logs and RTC, as well as storing a valid mobile number and sending SMS to that number. Microcontroller will send signals to Electronic Circuit. Electronic circuit includes Motor Driver, Relay, Power Supply, Driven IC, Supporting LCD Screen etc. From Circuit processed signal will be given to motor for the rotation according to program requirement[2].

Assembly consists of two gear Bevel and Rack. It will make rotation according to motor movements Door Assembly Consists of door with attached rack gear. For movement as per motor, As the door gets open grains will be dispensed, according to delay.

V. METHODOLOGY

- User will give his Aadhar card and ration card to the ration vendor.
- Database will be created at server end.
- Details of the customer when entered will be stored in database.
- We have used HTML and PHP coding to create a registration form.
- Arduino Uno board will be used for implementing the hardware part of the project.

- vi. Once the customer gives his Aadhar number to the vendor, an OTP will be sent to the registered number.
- vii. Standard quantity of ration commodities is saved in the microcontroller.
- viii. Once the OTP is entered, the motor and pumps will start working, and the required amount of ration will be given to the user[Fig 1.]

VI. SYSTEM ARCHITECTURE

The system architecture is as shown in the figure[Fig 2].

A. Arduino Uno

The Arduino Uno is a microcontroller board. We simply need to connect it to a computer with a USB cable or provide power with a AC-DC adapter or battery to get started.

TABLE I
 FEATURES OF ARDUINO UNO

Microcontroller	ATmega328
Operating Voltage	5V
Input (recommended) Voltage	7-9V
Input Voltage (limits)	6-20V
Digital I/O Pins	14 (of which 6 provide PWM output)
Analog Input Pins	6
DC Current per I/O Pin	40 mA
DC Current for 3.3V Pin	50 mA
Flash Memory	32 KB (ATmega328) (0.5 KB used by boot loader)
SRAM	2 KB (ATmega328)
EEPROM	1 KB (ATmega328)
Clock Speed	16 MHz

B. Android device i.e. HC 05 - Bluetooth Module

This technology is used to transfer data over short distances from fixed and mobile devices, and to build personal area networks (PANs). All the communication between customer and vendor, especially sending of OTP will be done with the help of this bluetooth module. The range of this device is nearly 10 meters.

C. Relay

It is an electrically operated switch. An electromagnet is used in many relays to operate a switch mechanically. Relays are used wherever necessary to control a circuit with the help of a separate low-power signal, or where several circuits need to be controlled by one signal.

D. Motors

We are using 300 RPM Johnson Gear DC Motors 12V, which offer custom engineering solutions based on a wide range of low voltage and high voltage DC motor platforms. Power density and compact packaging options will be provided by this DC platform.

• *Concept of motor*

The voltage will be converted to an appropriate value using a transformer, a voltage regulating IC, e.g. 7805, 7806, 7809, 7905 etc. Different voltage will be supplied to different parts of system. Embedded C programming language will be used to program a Arduino board microcontroller (ATmega328). The system will be controlled according to the program. This system consists of 2 motors and 1 pump motor. As 2 motors are dc motor, they will be supplied 12v dc supply, whereas the supply for pump will be 220v ac[Fig 3.a. and Fig 3.b.]

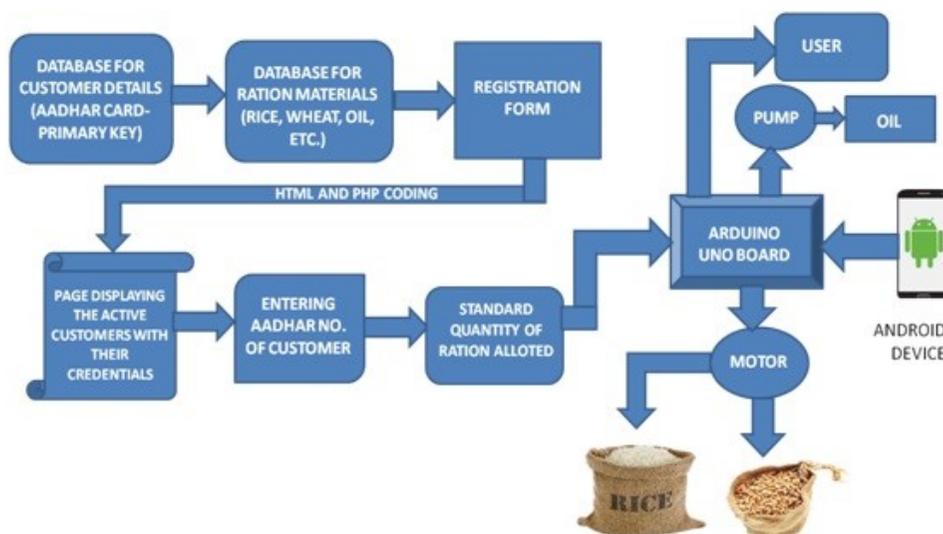


Fig 1. Methodology of the proposed system

VII. PROPOSED SYSTEM ADVANTAGES

- i. Reduces the requirement of man power.
- ii. Needs less time for measuring the goods.
- iii. It has high precision and accuracy, as it measures time for distribution.
- iv. Reduces spilling of ration commodities while measuring them.
- v. The vendors cannot give less quantity of goods to the customers.
- vi. It stores the record of the distribution of goods.
- vii. It uses the Aadhar card UID number for determining the quantity of goods allotted for the customers.
- viii. As it uses details of Aadhar card, the government can track the record of the distribution of goods, provided if a server is maintained.
- ix. The customer can withdraw the goods any time in the allotted time span, as the shopkeeper has no part in distribution.

VIII. APPLICATIONS

- i. This methodology can be adopted by the government and implement it on a large scale.
- ii. The future ration shops can include these modules to run in an effective manner so that the malpractice rate is reduced and the poor can get their share. We can minimize human interaction with the functioning of the machine to a great extent, thereby reducing the opportunities of malpractice.
- iii. For future research the proposed methodology can be modified to include biometrics and image processing technologies for authentication instead of RFID tags to give more security.

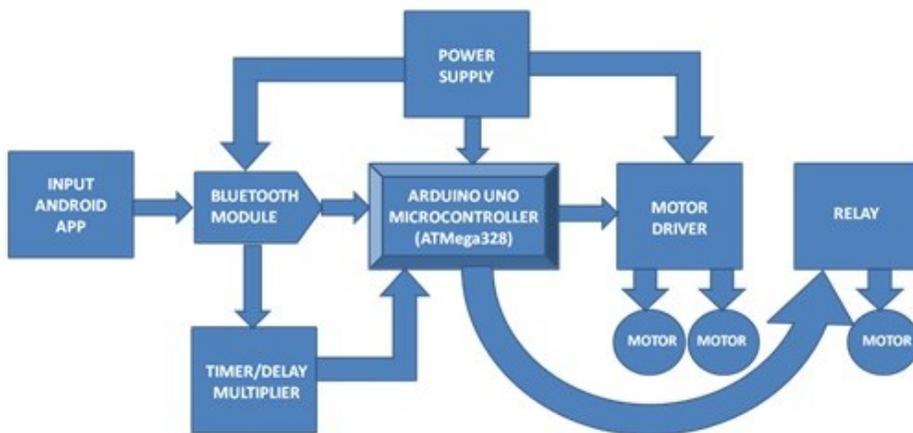


Fig 2. System Architecture

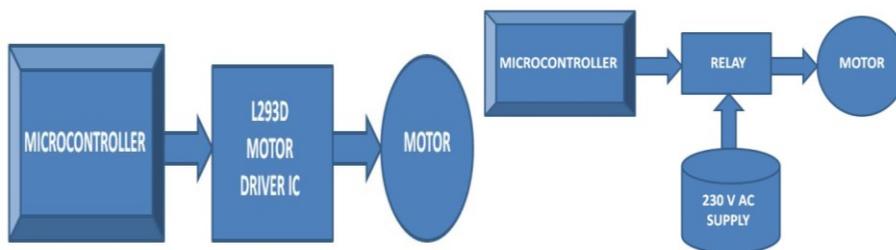


Fig 3.a. Flow diagram of driving a dc motor Fig 3.b. Flow diagram for driving a pump motor

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X. CONCLUSION

The proposed system will help reduce the middle-man concept of providing the ration commodities, and reduce the time required to provide the food grains. Due to automated system, the problem of corrupt methods of black marketing and hoarding will be eradicated. This will also be very cost effective for the government to install and use in ration shops.

XI. FUTURE SCOPE

- i. The authentication of the customer can also be checked by taking his finger print and getting it scanned through the RFID module which has stored his/her finger prints for that ration shop.
- ii. Load cell and many other sensors can be added for improving the accuracy and reliability.
- iii. A local and central server can be added, which can be monitored.
- iv. If more stations are added the users can withdraw the goods from anywhere.
- v. Hardware and software can be upgraded according to requirement.
- vi. If storage is big, it can serve many people.
- vii. We can use bio-sensors to check the quality of ration commodities.

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