

# Arduino based Smart Ration Distribution System for Prevention of Civil Supplies Hoarding in India

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## Abstract

Today's ration distribution system faces many challenges and lots of issues like illegal smuggling and corruption of goods happens in the ration distribution centers in India. These controversies include irregular measurement of the goods, wrong entries in the manual stock register. Other times the actual goods provided by the government for the distribution does not reach the common people. In our project we have replaced the manual work done in the distribution centers by smart measuring automated electronic and secured device by entering the Aadhar number which is provided by the government. With the help of Arduino microcontroller which measures the goods accurately and updates it in data base periodically about the availability of goods and information regarding the transactions done in a digitalized manner. Here, to have access to the information and data regarding the stock a main data base is created which can be access by both common consumers of that particular locality and by the government main stream invigilators for distribution centers from their head office. Therefore, this project ensures corruption free ration centers working system which will also enhance the direct communication of the consumers with the government and will defiantly provide transparency.

**Keywords: Automated Measurement; Digitalization; Accurate- Solid Measuring Module, Liquid Measuring Module Using Arduino Microcontroller, Online Verification Method**

## I. INTRODUCTION

This project is to build a smart automated ration distribution system. Which, we believe will suit the Needs and necessity of the future modern world and people. Most of the people using ration shop to buy their Monthly goods from the government use ration cards. Which, they use as a record to register the amount, Quantity and type of goods purchased by them. Then, they get their commodities through weighing systems the Whole process involves manual work and requires manpower therefore, found to be time consuming which is an Exhausting process. This usual process that we follow at present has a few drawbacks for example, the constant Issue faced by the common people is about the unavailability of goods which usually happens due to the illegal smuggling of the goods by the ration shop workers and dealers of that particular locality. And, also the in accurate measuring of the goods by the ration shop workers knowingly or unknowingly i.e., human mistakes. In which the commodities needed by the people does not reach them in a proper way. This proposed project known as Automatic ration machine helps people using ration shops to buy their monthly household commodities in an Enhanced manner by making the whole process smart, efficient, reliable, easy to use and most importantly Prevents corruption, forgery and smuggling of goods by the dealers and workers of the ration shop. In short, this project ensures the efficient reach of the goods to the common people as per their requirements. The proposed project is an electronic device with smart features like IOT interfacing, smart measuring of goods and it maintains the record of all the information regarding the goods brought and delivered to the consumers. The basic working of the device is to know the requirements of the consumer, gets the acknowledgment or confirmation regarding the purchase, measures the needed good accurately and delivers it to the consumer in a smart way. The whole process is digitalized and recorded in the main data base to avoid cheating in selling of goods. This device also gives the details of the total amount of the goods received, total amount of goods delivered and amount of goods remaining in that shop to common people through just a click in order to have transparency in the process. The consumer can also access the availability of the goods in the shop of their locality through internet through which they need not go back and forth to the shop in reach of commodities during their unavailability which saves people's time and increases the efficiency of the project.

## II. RELATED WORK

### A. S.Valarmathy, R.et.al,[1]

Model based event detection and localization states one method to deal with leakage occurrence in water distribution systems (WDS). Since access to hydraulic models and measurement data of real world systems is limited for researchers the opportunities for testing new model approaches on one and the same WDS are scarce. In this article we present an experimental water distribution system (EWDS-TUG) that allows for simulating scaled real world water demand and leakage scenarios. We show example experiments and the related measurement data along with metadata that are supposed to be provided to the scientific community for model testing.

### B. Dhanoj Mohan et.al,[2]

MEMS based flow rate sensor and flow direction sensor is a crucial to the determination of exact fluid flow path. Conventional rectangular cantilever beam detects based on the surface strain of the beam with respect to the mass flow. Different structured beam will greatly affect the sensitivity. In this paper different geometries of cantilever beam such as rectangular, inverted trapezoidal, triangular are designed and simulated using the finite element software intellisuite 8.7. The simulation results show that the inverted trapezoidal geometries having the more deflection at same stress of the conventional beam and thus increase the sensitivity by approx. 1.45 times.

### C. Edward H.Reichard et.al,[3]

In the present days many immoral activities are taking place in ration shops, which are meant to distribute the commodities to the people who are in below the poverty line, as the distribution process is manually operated and due to which it consumes a lots of time. To overcome this problem we one can use RFID technology. In this paper RFID tags are introduced.

## III. PROPOSED METHODOLOGY

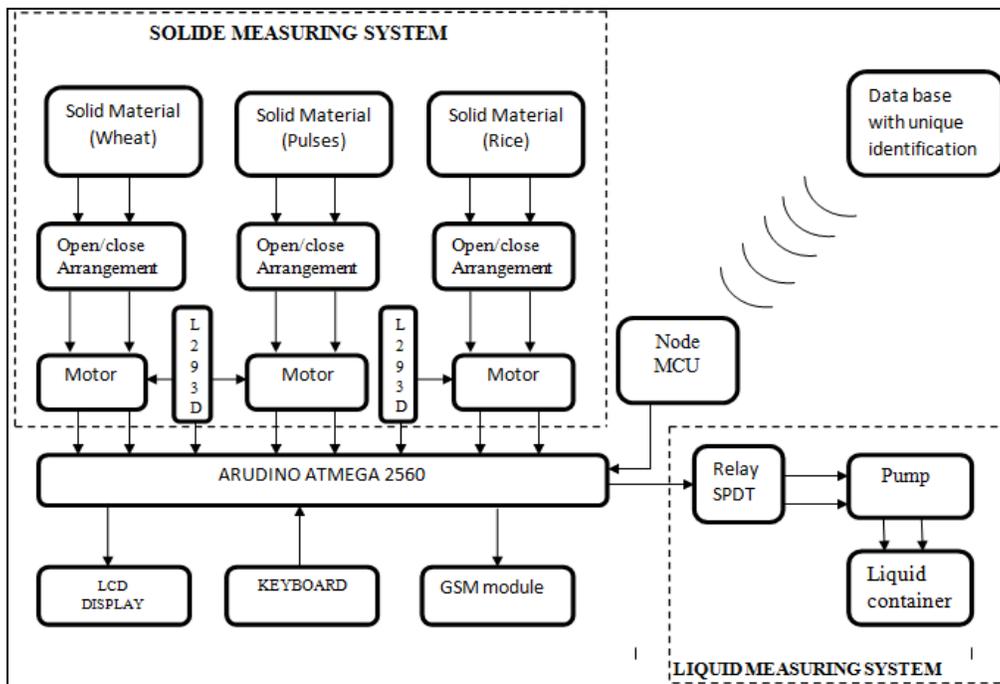


Fig. 1: Block Diagram of Arduino Based Automated Smart Ration Distribution System

Figure 1 shows the block diagram of automatic and smart ration distribution system. This system divided into 3-parts.input part, solid measuring system and liquid measuring system. The whole system works on the internet which is provided by the node MCU. The the consumer family details stored in the main database. The data base maintained by using HTML and PHP software.

The input part consists of keyboard, GSM module, LCD display. Initially consumer needs to enter the unique identification that is Aadhar number by using keypad. This Aadhar number is compared with the main data base. If Aadhar number is correct then the authorized person will get message like (your ration account will open, if and only if you accept this message else it will be denied).if the authorized person accept this message he will get OTP.by using that OTP, consumer enter into their account.

Second step is called as solid measuring system. It consists of three containers through which solid materials flow and enter into the solid measuring system. A solid measuring system consists motor valve which is connected to Arduino microcontroller. The

mechanical timing arrangement that is opening/closing of mechanical valve which done by Arduino microcontroller .L293D motor driver IC is used to drive the motor.

Third step is called as liquid measuring system. It consists of SPDT relay, AC pump, liquid container and liquid flow sensor .the output of microcontroller is 5V (DC) but pump works on AC (230V) hence SPDT relay used drive the pump. Here Arduino micro controller used to ON/OFF the pump. Liquid float sensor calculates the pulses by that it measures the liquid flow.

According to the consumer requirement, they will get commodities. Here Arduino micro controller measures the goods accurately and updates the data base periodically regarding the transaction done in the digitized manner. Access to the information. Updated information can be can be viewed by both consumers and government officers.

#### IV. MECHANISUM USED IN SOLID FLOW CONTROL

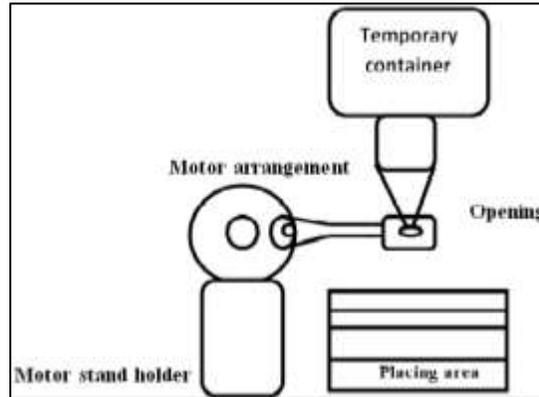


Fig. 2: Mechanism used For Solid Flow Control

Fig 2 shows the arrangement is controlled by Arduino board. It consists of a mechanical pad and a motor. The motor can make the mechanical pad to move (open and close) with some gear arrangements. The mechanical pad is connected to a shutter which opens and closes according to the comment from the Arduino. The electrical DC 12V motor operates in both directions which is done with the help of an IC L293D

#### A. Flow Chart

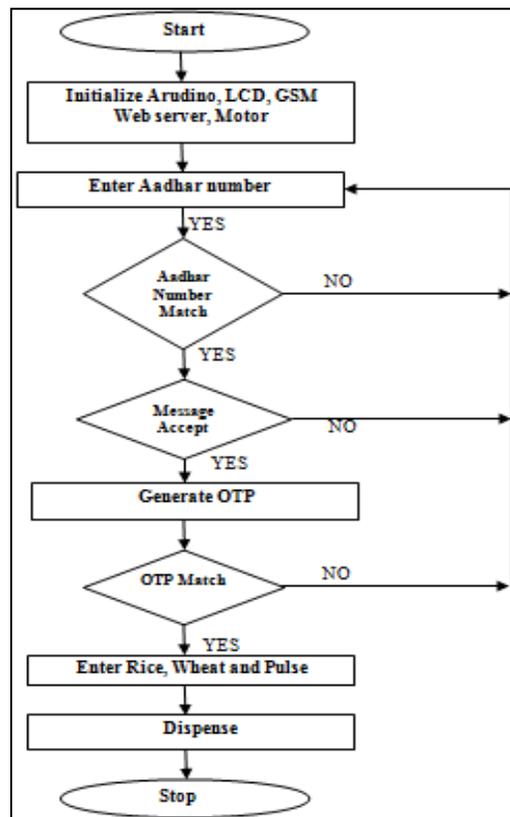


Fig. 3: Flow Chart of Dispensing of Solid Items (Rice, Wheat, Pulses)

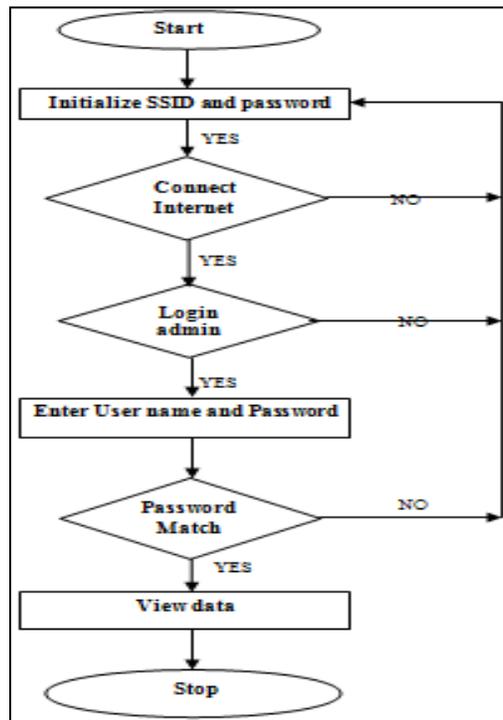


Fig. 4: Flow Chart of Web Server to View Updated Data

Fig 3 Flow chart of dispensing of solid items (Rice, wheat, pulses).to start the automatic ration distribution first we have to initialize Arduino, LCD, GSM, Webserver and motor. Initially consumers have entered the Aadhar number (12-digit). This Aadhar number compared with the main data base. If Aadhar number is acceptable then authorized person will get message. If he accepts that message he will get OTP, by using that OTP they enter into their ration account, else it will be denied. After the OTP matches this system will ask quantity for Rice, wheat, pluses and oil. According to the requirement of the user the solid items will be dispensed, after dispensing the commodities this system will get stop.

Fig 4 shows Flow chart of web server to view updated data. To view the updated data on the server first we have to enter the secured server ID (SSID) and password, if it matches then the system connected to the internet. If internet is not connected then again we have enter the SSID and password .after connecting to the internet web page will get open, this web page will ask user name and password, after entering the user name and password .consumers can view the updated data.

## V. EXPERIMENTAL RESULTS

The desired results obtained on the web server whose screen shot is as shown in the below figure 5. In this web page consumer can access the updated information that is how much quantity of goods (Rice, wheat, pulses and oil) they have purchased, and this web page consists of their phone number and Aadhar number.

S.NO	AADHAR ID	MOBILE NUMBER	WHEAT(KG)	PULSES(KG)	RICE(KG)	OIL(LTR)	LAST UPDATE
1	272844712932	9801649569	0	0	0	0	2018-06-18 12:38:51
2	475687669949	9801649569	10	0	0	10	2018-06-18 14:27:56
3	123444789511	7896707155	1	0	0	2	2018-06-18 12:38:52
4	260181307206	7066707155	1	1	1	0	2018-06-17 15:05:53
5	209473019581	7829662291	1	10	0	0	2018-06-11 15:38:54
6	722394402461	7829662291	1	0	0	3	2018-06-17 17:45:56
7	272844712932	7879886946	0	0	0	0	2018-06-07 13:59:50
8	197988695024	7879886946	0	0	0	0	2018-06-07 13:59:53
9	471871862919	8722330920	0	0	0	0	2018-06-07 14:00:15
10	80384644452	8722330920	1	0	0	0	2018-06-17 13:14:27

Fig. 5: Shows the Screen Shot Of the Web Page in This Consumer Can Access the Updated Information

Consumers after entering the quantity of oil, oil will be dispensed. Below Figure 6 shows screen shot of oil dispensed. This is displayed on LCD.



Fig 6: Shows the Screen Shot of Oil Dispensed

Consumers after entering the quantity of wheat, wheat will be dispensed. Below Figure 7 shows screen Shot of wheat dispensed. This is displayed on LCD.

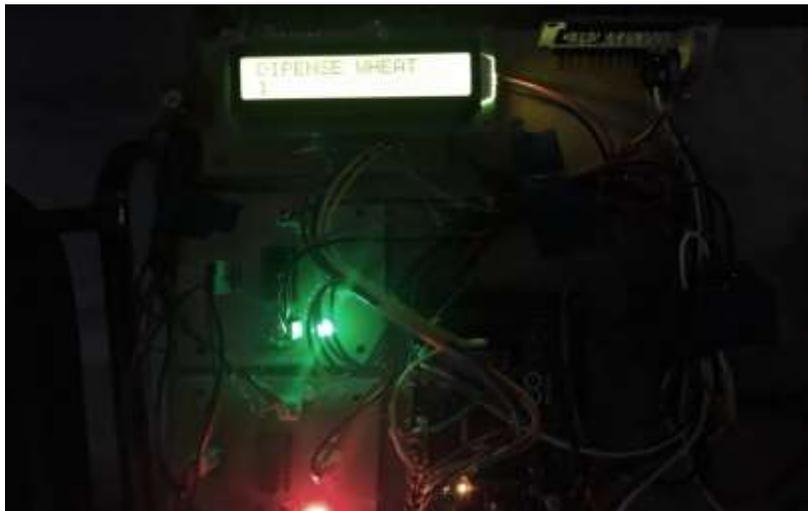


Fig. 7: Shows the Screen Shot of Wheat Dispense

Consumers after entering the quantity of pulse, pulse will be dispensed. Below Figure 8 shows screen shot of pulse dispensed. This is displayed on LCD.

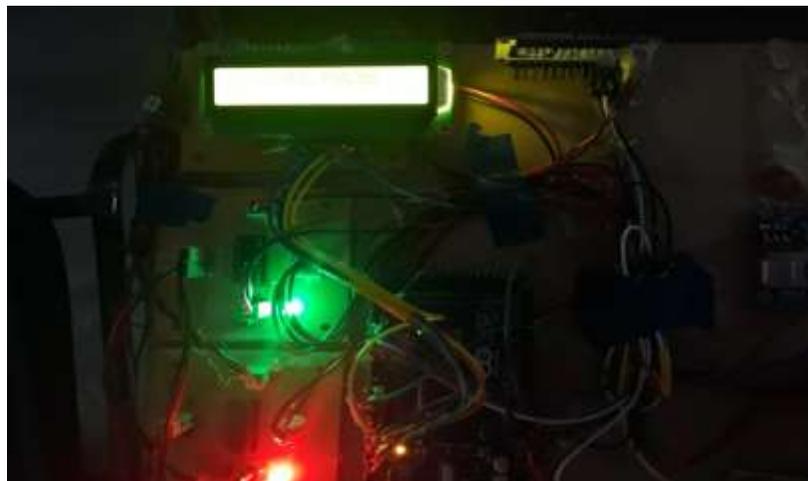


Fig. 8: shows the Screen Shot of Pulse Dispensed

## VI. CONCLUSION

In this project the identification of individual consumer, accurate measuring of solid and liquid goods, access of stock information and authentication can be checked. We believe that this project will bring a change in the present society of India. It will be a contribution to the scheme our country is highly and efficiently undergoing “the Digital India!” And, also will enhance the scheme of “Corruption free India! “This project can also become a part of e-governance that India is under taking at present. It will make the process of buying commodities from ration shops mart, automated, time saving and secured system (Aadhar number and by getting OTP). And, will bring the transparency in the ration distribution system which will create a start of digital and corruption free India, which will in turn create a bridge between the common people and the government, through which the government will earn the people’s trust and support to move forward a step ahead to make India a developed country.

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