Automatic Ration Dispensing System

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Abstract- *Indian government is distributing grains to the poor people at affordable price. The ration distribution system is also referred as public distribution system. The existing system works on manual distribution system, which makes inaccurate measurement in quantity of materials. In this system involves a human errors, corruption and illegal smuggling in commodities. To avoid this problem we are using MASTER KEY method and finger print authentication process. The finger print authentication process involves user One Time Password valid for few minutes. In this paper MASTER KEY method is introduced, the MASTER KEY is mainly to initiate the process. This method also involves tracking and maintains the database. The master key is nothing but user Password which is shared only to government authorized person. The government officer will place the finger on the finger print sensor to scan. The authorized finger print is stored in the database. If finger print matches system will send a user Password to start the dispensing materials. Every family card holders details and with respective finger prints is saved in the database. To get the commodities customer need to scan the finger for verification and security process. In this proposed system human intervention is not present due to automatic system and reduces the corruption using finger print sensor. After ration delivered to the consumer, the system is connected to the government database or server through GSM module to provide ration information to consumer and also ration distribution system authorities.*

Keywords- Arduino Mega, Finger print sensor, GSM Module, Ultra Sonic Sensor , Solar panel.

I. INTRODUCTION

Public distribution system provides food for the below poverty section at low price, which is distributed by the Indian government. Each family is using this benefit as per the card. Different food grains like wheat, rice, finger millet and sugar is fixed quality for every month based on the total number of people in each family.

The Indian government offering different facilities for poor people by providing ration. Due to more corruption in ration distribution system such facilities do not reach up to poor people. Every family had valid ration card to buy the commodities from the ration shops. This commodities is collected at once in every month at ration shop. The commodities will distributed by shopkeeper through the weighting system with the help of human intervention. In such cases we can noticeable drawbacks which people can suffers, firstly the inaccuracy in imprecise weighting of commodities due to human errors and then secondly, sometimes consumer may miss the commodities, such commodities will misuse by the shopkeeper when there is no monitoring of such commodities. Then the shopkeeper will sell the commodities in the market and make a profit without intimation to government and consumers.

Shopkeeper acts as bridge between government and consumer. So in this proposed system we are trying to enhance the security and reduce the corruption in the ration shops.

In this paper, the proposed project "Automatic Ration Dispensing System" aims to increase the security to the system and reduce the corruption and above mentioned drawbacks.

In this project the government officer should initiate the process instead of shopkeeper by placing finger in finger print sensor and if matches he gets user password to registered mobile number. Then shopkeeper can distribute ration to the consumer. At the time of initiate, officer updates the ration details records to the government server or portal.

This system also eliminates the human intervention while providing ration due to system is automatic and all the dispensed commodities are updated in the government server.

Another technology used in the proposed project of this paper, is the ultra sonic sensor which helps to detect the commodities level in the container. When the commodities become no stock or empty in the container, the ultra sonic sensor updates the status to refill commodities. The government officer will refill the container every time when commodities become empty.

To send a SMS to the government or to consumer we are using GSM (GLOBAL SYSTEM FOR MOBILE) technology, helps to sends One Time Password in the form of

SMS to the consumer to buy the ration and also about ration delivery and to the related authority.

Fig.1. Ration Shop

II. PROBLEM STATEMENT

The goal of this project is to provide more transparency to the consumer and reduce the corruption. The government suffers corruption in present situation like ration forgery, black marketing etc. The major drawback is that the weight of the materials may be inaccurate due to human mistakes and there is no transparency about ration material distribution. This proposed system helps to reduce the corruption and the commodities will reach to the needy people accurately. Dispensed commodities will update in government portal in time to time manner after dispensing materials.

III. PROPOSED WORK

The proposed system consists of Master key method to initiate process for automatic ration dispensing materials. This method involves finger scan of the government authorized person and if it matches he gets a Password to the registered mobile number. That Password should be entered, to start the process. In our system we have used arduino mega to automate the system. In this prototype model for demonstration of the automatic ration dispensing system we have a used container for materials or grains. To precise and accurate control the dispensing of materials from commodities container we install programmable dc motor controlled valves at the outlet of the commodities container. We are using finger print sensor for authenticate the customers to buy the commodities. To communicate or message facility we are using GSM module.

Once the Consumer finger print matches in authentication process, he will get a SMS called as a One Time Password (OTP) valid for certain minutes. After if OTP matches consumer can get a ration and the same details will be updated at the government server.

IV. OBJECTIVIES OF THIS PROJECT

The four main objectives of this project are-

1. Using natural resource (Solar power) to operate system and save electricity.
2. To provide more authentication, Master Key method is used.
3. By providing a smart technology through GSM, Ultrasonic sensor for maintain database.
4. By using register number commodities are distributed and database is updated.

Objective-1:

Solar energy is natural renewable source. Electricity is necessary in order to start the system. This causes electricity usage bills to the government which is burden to pay bills. In order to reduce electricity bills, we are using solar energy instead of electricity to run the system.

By using rechargeable battery we can store the solar energy. Solar panel saves the electricity and stores into rechargeable battery. This battery can use until low charge in the battery and again we can charge the battery through the solar panel. In this proposed system we are using solar energy to run the prototype of automatic ration dispensing system.

Objective -2:

To avoid corruption in ration dispensing system, we need enhance the security. Master key method eliminates the corruption and every detail of commodities will save at the server. Each and every day dispensed materials details will record and updated in government portal. Refilling the commodities will look after by the government authorized person. The procedure is given below

1. The authorized person will start the process of the system by authentication process and after finger print matches, authorized person will get SMS of a Password called as master key to start the system.
2. The master key is Password which will shared only to authorized government person, to start the process or dispensing a materials. The finger print of the authorized person data is programmed in the arduino to execute or to run the system and he also maintains the system to work properly.
3. The entire process will start only when authorized person is verified by his finger print and Password. At the end of the last day he will close the system and also checks the dispensed materials in the system

Objective-3:

To provide more authentication, we are using user OTP which is valid for some minutes. To get an OTP, communication should be establish between consumer and government to the consumer register mobile number. In this proposed system we are GSM module (Global System for Mobile communication) to send messages to government or consumer.

GSM is interfaced with arduino to sends information in the form of SMS. This message service sends only to registered mobile number. Here GSM purpose, OTP and also after providing ration to the consumer the government of public distribution system receives the dispensed materials delivery report from the pc with the help of GSM. Further the details will update regularly to the government portal or specific PDS (Public distribution system). In this project we are inserted sim to the GSM module to interface with arduino by using some AT commands.

Objective-4:

The consumer mobile is mandatory to achieve our fourth objective of our project. Procedure for objective 4 is as follows,

1. The consumer should enroll or register to the system. Using finger print sensor which is interfaced with controller and arduino can get ration.
2. The controller checks and prompts finger print sensor information for every 200 msec. This finger print sensor searching method is [1: N] method, by comparing input data to the all stored data in database. Here we are storing only few without using database.
3. Using register mobile number of consumer can get ration without using finger print sensor. The GSM sends OTP to the registered number which programmed in the system.
4. After, the consumer gets a OTP to buy a commodities and by entering OTP through keypad.

This objective can also eliminate various virus diseases caused through finger print sensor. The distribution can be taken up with a one time password (OTP) based authentication on the consumer registered mobile number of the head of the family.

V. EXISTING SYSTEM

In present situation the consumer has to buy ration using ration card from the ration shops. When get commodities from the ration shop, consumer need to submit the ration card and further sign in the ration card for record the details. In some ration shop instead of sign they will verify through biometric process and quantity of ration will depends upon the ration card types. After the shopkeeper will issue the ration through weighting system with the help of human intervention. In such cases having drawbacks, firstly is weight of the commodities or grains may be inaccurate in quantity because of human mistakes while weighting the materials. Second is not maintaining data of dispensed materials details in the ration shop. The shop keeper will entries false or wrong data of dispensed materials. Making profit by selling materials at the market at high price.

Finger print is the last point to sells the commodities to the card holders. The present system of public distribution system works in a two level where as the responsibilities are taken between state and center government. State government is responsible for finding poor people and providing facilities to them. But central government is responsible for buying foods or grains at minimal price. The center government will decide the allocation of the material to the each state.

VI. BLOCK DIAGRAM

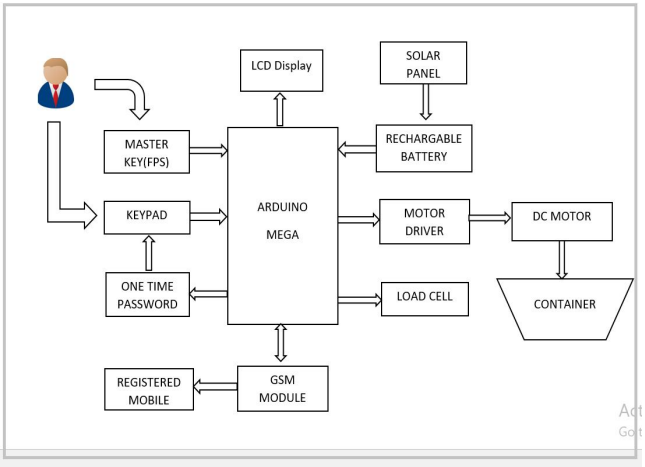

Fig. 6. Block diagram of automatic ration dispensing system

The Block diagram represents automatic ration dispensing system is shown in figure 6. It consists of many parts such as finger print sensor, arduino mega, keypad, GSM module, LCD display, solar panel, Motor driver, rechargeable battery, DC motor, Load cell, ultrasonic sensor and the container etc.

A. Solar panel and rechargeable battery

When the sun shines in a day time, we can store the electricity generated by using solar cells or steam-driven turbines by using batteries. Solar battery had their own inverter and provides a integrated energy conversion. The more expand batteries capacity, the more energy can store in a battery.

The rechargeable battery will supply a power to the arduino and this arduino will supply power to the modules. The battery is charged from solar energy to provide a electricity to the system.

B. LCD Display

To display the materials and information we are using LCD Display. Lcd display is a electronic visual display. It has light modulating properties of a liquid crystal display. In this system we are using 16*2 display alphanumeric to display the ration information.

C. Arduino AT mega 2560

Arduino is a free open source application for building various electronics projects. This gives two types of access first is physical programmable circuit board it is also referred as microcontroller and second is piece of software or integrated development environment. This can runs on personal computers, by writing code for specific task and should check the code and upload to the arduino board. In this project we are using arduino AT mega 2560. This board will provide more input and output pins for building project.

D. GSM module

Global System for Mobile communication is used for message purpose to consumer and the government about the ration and OTP. GSM mainly it will digitizes and compresses data and then further it will send to down a channel with two other streams of data of the user and each had its own time slot. The operating at either 900 MHz frequency band. GSM interfaced with arduino and send information to the registered mobile number in the form of SMS format. In this proposed system we are GSM module sim 300.

E. Keypad

Keypad is interfaced with the arduino. The purpose of the keypad is to enter the OTP using keypad. In this proposed system we are using 4*4 matrix keypad is used. switches and each row and column are interconnected each other via switches in unique combination of rows and columns, if row1 and col1 can be connected to only by sw1.In the same way row3 and col3 can only be connected by sw11.

F. Load Cell

Load cell is a transducer will be used to create an electrical signal and it works on the principle of a planar resister operation. It has better resonance value. The purpose of load cell is to weight the materials automatically for the consumer and dispatch the materials. In this project we are using load cell for automatic weighting machine and dispatch the commodities.

G. Finger Print Sensor

Biometric authentication is done to identify their details by person intrinsic physical or behavioral traits. There are different biometric procedure authentication like iris, thumb scanning, and finger print etc. The finger print sensor finds a finger placed on the window, the scanned finger print will check in the stored database. If it matches any of the stored finger print, returns with appropriate information of person details stored in data base. In this project, We are using finger print sensor R307 model.

H. DC Motor

DC motor is a rotary electrical motor which helps to that coverts direct current electrical energy into mechanical energy. The dc motor rotates through motor driver. This dc motor will placed at the container. The dc motor will make container open and close the wall commodities container. Here we programmed dc motor to rotate precise and accurately.

I. Motor driver

Motor driver is a small current amplifier. The motor driver takes the low current control signal and then coverts to high current signal. This motor driver can drive two dc motor simultaneously. It can drive inductive loads such as relays, DC and bipolar stepping motors. The direction of rotating motor depends upon input values, 01 for rotating forward and 10 for rotating backward.

J. Ultrasonic sensor

This sensor is basically detects distance by using ultra sonic waves. This sensor called as a ultrasonic distance measurement technology. The sensor measure the distance by the target or object by measuring the time between the emission at target transmitted and reflected back to reception. This wave will detect the commodities level in the container

using the ultrasonic waves. This sensor requires 10 micro second pulses to the trigger input to start the ranging. In this project we are using ultrasonic sensor HC-SR04 module is used.

VII. FLOW CHART

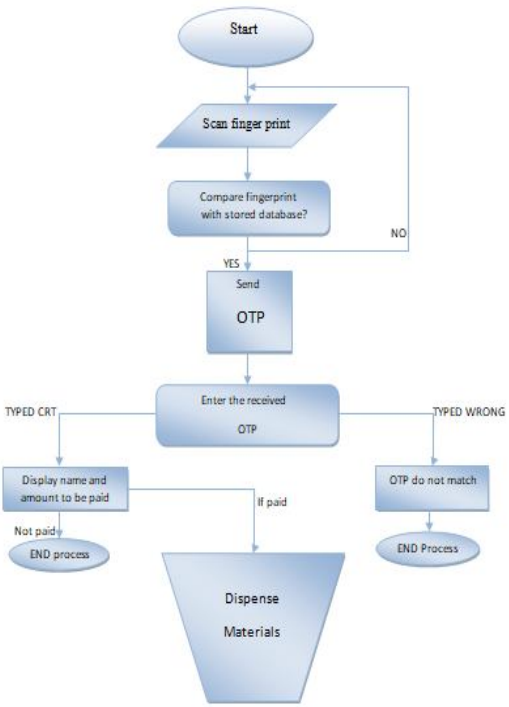

Fig.7. Flow chart of automatic ration dispensing system

ALGORITHM:

1. START
2. Scan the finger print of the consumer
3. Compare the all finger print with stored database.
   - If finger print matches with respective person details, then go to step 4.
   - If finger print not matches then go to step 2.
4. Send a OTP to registered mobile number
5. Enter the received OTP
   - If OTP is correct, go to step 6.
   - If OTP is wrong , then displays a OTP do not match and end process.
6. Display name and amount to be paid
   - If amount is paid, go to step 7
   - If amount is not paid, end process
7. Dispense materials.

ADVANTAGES AND APPLICATION

- Reduce the human errors so that transparency and efficiency can be achieved.
- In this system automatic entry takes place about dispensing.
- Fast process than existing process.
- Paper work is reduced.
- Requires low power consumption.
- The essential data collection will also happen automatically.

VIII. FUTURE SCOPE

- Online payment can be implemented with either automated deduction or pre charged card from customer's bank account
- Tracking a materials through GPS technology can be done while delivering commodities to the fair shops.
- Other parts of public distribution systems are brought under automated system.
- Ration can be booked on online before going to ration shop and get a time slots and OTP for each person.
- Each consumer can access information about ration dispensing materials.
- All information of data can push to cloud about the dispensing materials and can maintain all records.
- The ration booking can be implemented, Interactive Voice Response System (IVRS) method in future days.

IX. CONCLUSION

In this paper we have proposed system automatic ration dispensing system model. In the present existing system the ration distribution system, there is a drawback of ration forgery. The ration distributor corrupting a food grain or ration material during ration distribution. In our project we are replaced the manual entries and thus in the way we are able to reduce forgery, as we are used master key, and finger print module and OTP. In which the rice is distributed through automatic mechanism without labor. Another drawback is ration details of the dispensed materials to the consumer and entering false or wrong records will updated to the government by shopkeeper. It can be overcome with master key method. Thus we have made our system in such a way that it will send dispensed details to the users registered mobile number and also to the public distribution system authorities through GSM.

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