IoT Based Ration Card System Using Bluetooth Technology
Neha Sharma¹, Ayushi Gupta², Vinod Ghadge³, Mayank Harwani⁴
UG student¹,²,³,⁴
Department of Electronics Engineering
Vivekanand Education Society’s Institute of Technology, Hembur, India

Abstract:
Ration card is one of the important documents for every Indian family. Every family is given the facility by the government to receive food grains against a card. But the present ration distribution system has lot of limitations like low processing speed, false announcement of deficit in food grain, material theft in ration shop, etc. This problem can be solved by IoT based ration card system using NFC enabled hand held reader which works on Arduino with Bluetooth technology. This system replaces the manual work in the ration distribution system. NFC tag is assigned to every Indian citizen from government offices. These NFC tags are provided instead of conventional ration cards. In this system all the transactions are done by IOT.

Keywords: Internet of Things, Bluetooth module, NFC reader and tag, Arduino.

I. INTRODUCTION

Ration card is an official document entitling the holder to a ration of food, fuel, or other goods issued by the Government of India. It is primarily used while purchasing subsidized foodstuffs (Wheat and rice) and kerosene. The card has been used since World War II and its use continues in the 21st century. It is an important subsistence tool for the poor that provides proof of identity and a connection with government database. The ration store uses a ration card which is in the form of a book, used for identification of customers and contains a purchase history. In conventional ration card system many problems exist. There are millions of ineligible and fraudulent ration cards. At the same time, millions of poor families have no ration cards. Ration shop owners in collusion with government officials divert the subsidized food supply and petroleum to the black market. The number of cards is inflated by bogus ration cards held under false names, in the names of dead people, real but ineligible people, and duplicate names from other areas. The ration quota of non-existent people and unused quota by real beneficiaries is shown as fully used-up, and material is diverted to the black market, causing huge subsidy loss of public money [1]. The proposed system uses to minimize the problems which are present in ration shops by replacing manual work by automatic system based on NFC reader and Bluetooth. Every consumer is provided an NFC card reader which acts as ration card. The NFC card has a unique identification number which is linked with Aadhaar card no. The consumer scans the card which will be identified and decoded with the help of hand held NFC reader. This reader is then connected to the Bluetooth through which the data of that specific NFC Tag (UNIQUE NO) is being shown. Then, using the web application we fetch the information about Customer from database. Whatever grains are allotted to consumer is displayed on computer. After the grains are received the data will be updated on web server. This data can be used by the government servant and consumer which will act as a backup by the consumer on this ration card account and shopkeeper cannot lie to the consumer. The proposed NFC based ration shop system would bring transparency in ration distribution system and would become helpful to prevent corruption[3].

II. SYSTEM DESIGN

Fig 1. Shows the functional block diagram of IoT based ration card system. This block diagram consists of NFC reader and Tag, Bluetooth module, Buck boost converter, power supply. The proposed system demonstrates distribution of food (Wheat/Rice) as well as kerosene. This system also reduces the manual work and corruption by the shopkeeper. In this system NFC reader is used as an input to system and Arduino output is transmitted to the computer using Bluetooth module.

1. Arduino:-
It is heart of the IoT based ration card system. The arduino nano is small, complete and bread board - friendly board based on the atmega3.0. It has more or less the same functionality of
the arduino duemilanove, but in different package. The ATmega168 has 16KB of flash memory for storing code and ATmega 328 has 32KB. Each of the 14 digital pins on the Nano can be used as an input and output.

2. NFC Reader:-
This is the Radio Frequency Identification 13.56mhz module which acts as reader and writer. NFC is used for near field communication. NFC is a set of short-range wireless technologies, typically requiring a separation of 10 cm or less. NFC operates at 13.56 Mhz and at rates ranging from 103kbit/s to 424kit/s. In this NFC tag we can store the data that is customer id. This NFC tag can be read by any NFC reader. There are four types of NFC tags viz. 1,2,3,4 based on storage capability.

3. Bluetooth module:-
Bluetooth serial module is used for converting serial port to Bluetooth. These modules have two modes: master and slave. This Bluetooth module has 6 pins - vcc, Gnd, Tx, Rx, Key, and Led. This module allows two way data communication. You can simply use it for serial port replacement to establish connection between the MCU or Arduino and the computer.

Flowchart:-

III. RESULT ANALYSIS

1. Window for shopkeeper

This figure 1. Shows the window which will be used by the shopkeeper. Whenever a customer scans his/her NFC card, then the customer id which is linked with that NFC tag (unique press done. As the process gets over the data will be updated on web server [2].

2. Login id window

This figure 2. Shows the login id page for shopkeeper and customer. After successful login, customer would be able to see his monthly transactions. At the same time the shopkeeper would be able to keep a track of the goods sold and the amount of goods left.

3. Web Page
This figure 3. Shows Whenever Customer scans their id, by the reader; the customer information will emerge in visual basic software. So the Shopkeeper will come to know the information about the customer, for verification. Once Verification is done the shopkeeper will proceed.

4. Hardware unit

The figure 4. Shows the hardware unit of IoT based ration system. This unit consists of Arduino, NFC reader and a Bluetooth module. Whenever the NFC tag is scanned by the NFC reader, NFC tag no. will be sent to Arduino. This ID is then decoded and transmitted to the computer through the Bluetooth module.

IV. CONCLUSION

Smart ration card system is based on NFC instead of the orthodox Ration cards. This will help replace manual handling of data with automatic processing. The IoT based Ration card system will pave a way for efficient management and administration of Ration distribution system. This will also help curb corruption to a great extent.

V. REFERENCES


