

# Authenticated Ration Distribution System Using RFID

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**Abstract:** The traditional public distribution system, intended to provide subsidized ration items to poor households, is the largest welfare programme in India. The ration distribution system is automated by using RFID and Fingerprint. This automated ration system replaces the conventional ration card system by RFID Tags. In addition to, these tags followed by fingerprint detector is placed in the machine in order to check the correct user access. If the user is a correct user, the next process takes place and the input can be given in the keypad. By giving the input the required products are received from the ration shop. In order to perform the similar operation, the embedded controller is pre-programmed. In order to involve government in the process, the proposed ration shop system is connected to the government database via GSM module, which further sends the up-to-date information to the government and the consumer.

**Keywords:** Global System For Mobile Communication (GSM), Personal Digital Assistants (PDA ),Global Positioning System(GPS),Time Division Multiple Access(TDMA).

## I. INTRODUCTION

Wireless communication is among technology's biggest contributions to mankind. Wireless communication is even for thousands or millions of kilometers far deep-space radio communications. It encompasses various types of fixed, mobile and portable applications, including two-way radios, cellular telephone, personal digital assistant (PDAs) and wireless networking. Other examples of applications of radio wireless technology include GPS unit, garage, wireless , keyboards and headsets, headphones, radioreceivers, television , broadcast and cordless telephone. Somewhat less common methods of achieving wireless communication includes the use of other electromagnetic wireless technologies such as light, magnetic, or electric fields or the use of sound. This involves the transmission of information over a distance without help of wires, cables or any other forms of electrical conductors. Within a few kilometers and thousands of kilometers, the transmitter distance can be found anywhere. Some of the devices used for wireless communications are cordless telephones, mobiles, GPS units, wireless computer parts and satellite television. Wireless communication is done by the transfer of information between two or more points that are not connected by an electrical conductor. The most common wireless technologies use radio waves.

## II. HARDWARE REQUIREMENTS

### A.RFID Reader and RFID Tags

The purpose of automatically identifying and tracking tag which are attached to the object is by the use of electromagnetic fields. Magnetic fields which is produced near the reader are powered by electromagnetic induction.

The passive transponder act as a interrogating radio waves by the use of energy.

A microchip from RFID tag is attached to a radio antenna . The chip can store maximum of 2 kilobytes of data. To retrieve the data store on an RFID tag, you need a reader. A typical reader which emit radio waves and receive signals from the tag. The reader then transfer the information into digital form. They work on the 434MHz.

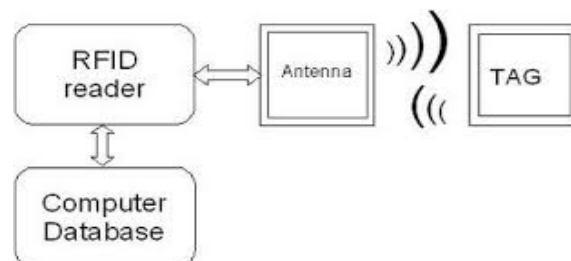


Fig.1 Structure of a RFID Reader

**B.FINGERPRINT SENSOR**

The Fingerprint Module has high-speed DSP processor. It is a high-performance fingerprint alignment algorithm and high-capacity FLASH chips. It is also a hardware and software composition. It is a simple structure with fingerprint entry, image processing and fingerprint matching.

**C.ARDUINO**

Arduino is used for building electronic projects. It consists of physical programmable circuit board (it is referred to as a microcontroller) and a piece of software, or IDE which runs on the computer to write and upload the code to the physical board.

Arduino platform has become popular among the people with electronics, and for good reason. In order to load a new code ,the Arduino does not need a separate piece of hardware , instead of that USB cable can be used. Additionally, the Arduino IDE uses a simplified version of C++, making it easier to learn a program. Finally, Arduino which breaks out the functions of the micro-controller that provides a standardized form .

**D.GSM**

GSM refers to second-generation wireless telecommunication standard for digital cellular services. It is based on TDMA (Time Division Multiple Access) technology. GSM uses 900 MHz, 1800 MHz and 1900 MHz frequency bands. Out of these dual-band phones operate on two frequencies, while tri-band phones operate on three frequencies. The European Telecommunications Standards Institute (ETSI) is a standard set to describe protocols for second generation (2G) digital cellular networks by mobile phones. This was expanded to include data communications by circuit switched transport, packet data transport via GPRS (General Packet Radio Services) and EDGE (Enhanced Data rates for GSM Evolution or EGPRS).Further improvements were made by third generation (3G) and fourth generation (4G) of UMTS standards LTE Advanced standards."GSM" is a trademark which is owned by the GSM Association.

**E.RS-232**

An integrated circuit MAX232 is created by maximum Integrated Products, which converts signals from an RS-232 serial port to signals that is used in TTL compatible digital logic circuits. The RX, TX , CTS and RTS signals are convert by the MAX232.

By the use of on-chip charge pumps and external capacitors the drivers provide RS-232 voltage level outputs (approx.  $\pm 7.5$  V) from a single + 5 V supply.

**F.LCD**

A Liquid Crystal Display (LCD) is also known as flat panel display, electronic visual display, or video display .It uses the light modulating properties of liquid crystals. Liquid crystals do not emit light directly, and it is available to display arbitrary images (as in a general-purpose computer display) or fixed images that can be displayed or hidden, for preset words, digits, and 7-segments displays in a digital clock.

LCDs are used in a computer monitors, televisions, instrument panels, aircraft cockpit displays and signage. They are common in video players, gaming devices, clocks, watches, calculators, and telephones, that have replaced Cathode Ray Tube (CRT) .

**III.METHODOLOGY**

RFID Reader would be placed at the designated location at the Ration shop, preferably at the entrance area. Beneficiaries must then show their valid RFID Tag in front of the RFID reader. Reader does the primary validation by biometric scanning (fingerprint verification) and upon successful verification with database, generates an OTP to their registered mobile number of the beneficiary for the secondary authentication. Beneficiary has to then enter the OTP along with the ration goods number say 1 or 2 or 3 (1-rice,2-wheet,3-sugar). Requested goods would then be issued to the beneficiary. If incase the beneficiary validation failed at any stage (during primary/ secondary) authentication process would be stopped then and there.

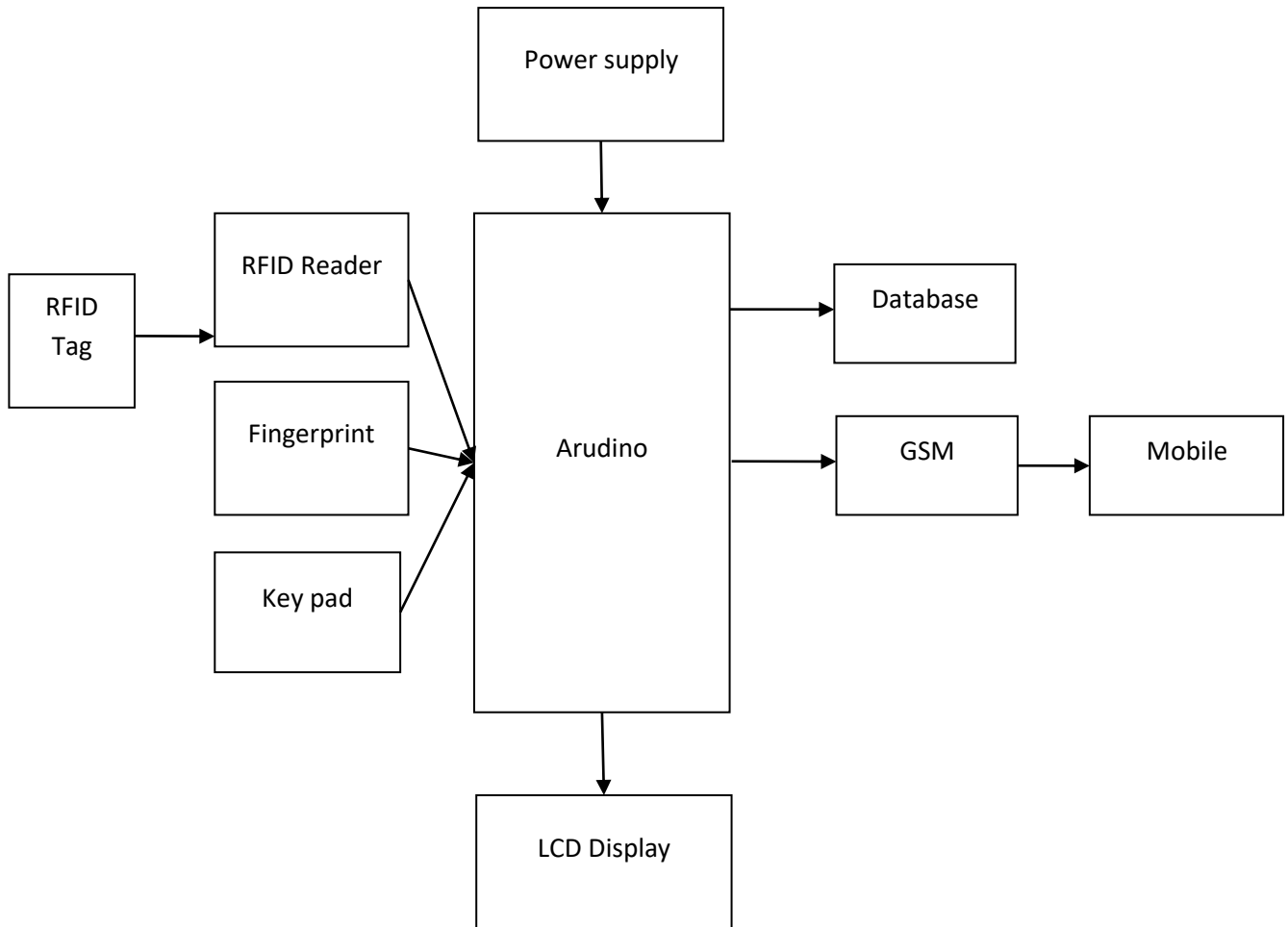


Fig 2. Block Diagram of the Project

#### IV. RESULT

All the hardware components are connected according to the block diagram. RFID is shown to the EM-18 Reader Module. It will read the RFID and if it is valid "WELCOME" message will be displayed in the LCD. Then it will ask for the finger print. Finger print sensor is used to check the finger print. If the finger print matches with the RFID then "Finger print matches" message will be displayed in the LCD. Then a OTP number will be send as a message to the number which is attached to that respective RFID. By using the number pad the OTP is typed along with the product needed number and '#' symbol at the end. Then the respective LED will glow.

#### V. CONCLUSION

Automated ration distribution system can bring transparency and accuracy to the existing ration distribution to the public and also help the government bodies to monitor real time consumption and plan the requirements and distribution to the public in an organized way.

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