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SMARTCARD BASED GROCERYDISPENSING SYTEM

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Abstract: *This paper is about automation in ration distribution using smart card. Here we are using a prototype model based on ATM machine. By this technology, we can achieve secure and interactive approach for automation for ration distribution. Smart card contains related information such as name, contact number. Customer details are stored in the central data base which is provided by the government authority. In automated system, we replace the conventional ration card by smart card (RFID based). SMS will be sent to the card holder and after each transaction the government data base will be updated. After customer purchases the material amounts get deducted from the smartcard which can be recharged.*

Keywords: RFID,GSM SIM 800L, PIC 16F877A.

1. INTRODUCTION

India is one of those countries that provide various ration materials to the poor at lowest price. Government and the central government together handle this operation. Public Distribution System (PDS) provides ration card issued under the government to each family in order to buy the materials. Shopkeeper who is a bridge between the government and consumer issues the ration card at once to each family. Depending on the income and number of members in the family, quantity of the materials will be fixed. Materials such as rice, sugar, kerosene, etc. are distributed every month.

Materials issued by the government may not reach up to needy and poor people because of human mistakes like, inaccuracy in the weight of the material and also selling of the left over commodities without any intimation to the government. If this system is automated then corruption will gets reduced to some extent. In the proposed work, an automated system is implemented to overcome the drawbacks that exist in the present distribution system. Ration cards are replaced with the RFID (Radio Frequency Identification) tags in which all the required information (name, contact number, etc.) are stored. Once when materials are given to the shops by government, through GSM (Global System for Mobile) every customer isinformed to collect the ration. Customer is asked to show the tag and then to enter the password. After the microcontroller identifies the authorized person, he/she is asked to enter the ration material and the quantity of their need. The government receives message with name of the person after he/she gets the ration material they have already entered. The whole system is controlled using PIC controller

2. EXISTING METHODOLOGY

A. Smart Card

The process followed by the ration shop is, government provides a ration card for a family. These cards are allotted to the family based on their income category. By the annual income of that family the provided card different privilege of purchase of product. In order to buy a product one must go the ration shop with his ration card and waits in a queue, when his turn comes, the consumer gives his card to the officer, and the officer checks the card and makes entries to the government register by mentioning the allotted product to the consumer and the product is delivered to the consumer. This system has two main drawbacks, first is the in-appropriate quantity of products and secondly making the fake entries, material piracy, and black market. The proposed system eliminates the above mentioned drawbacks and also provides the transparency to the consumers.

B. ATM machine:

The increase of automated teller machine frauds has lead to the development of new mechanisms that can overcome the security problems concerned with the personal identification numbers (PIN). The traditional PIN entry system is effective mainly because of its speed and memorability used to access the ATM authentication system. Then security has often been compromised thence

the need for a more secured authentication system for ATM operations. This paper therefore produces an enhanced ATM security system using second level authentication process. The method used for this research is to develop an enhancement of the existing system by building an additional security mechanism. The proposed system was found to be very realistic and cost effective when compared to other proposed authentication mechanism for ATM transactions.

C. GSM module:

This GSM modem is very flexible plug and play quad band. GSM modem is used for direct and easy integration to RS232 applications. It supports Voice, SMS, Data/Fax, GPRS and integrated TCP/IP stack. To be connected to a network, the shield requires a SIM card provided by a network provider. Here through this GSM, the details of the amount which are being detected in the RFID card will be sent to the user. Also the available balance will be known and recharge facility for the card will also be provided through a network.

3. PROPOSED METHODOLOGY

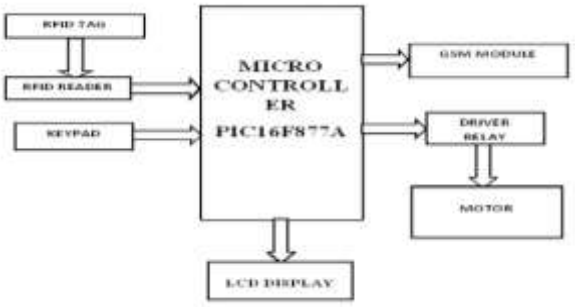

Fig.1

A. Hardware Requirements:

1) RFID Reader with Tag:

An RFID reader is used to interrogate an RFID tag. The reader has antenna that emits radio waves; the tag responds by sending back its data. Many factors can affect the distance at which a tag can be read (the read range). The frequency involved for identification, the antenna gain, the orientation and polarization of the reader antenna and the transponder antenna, as well as the placement of the tag on the object to be identified will have an impact on the RFID system's read range.

2) PIC 16F877A:

PIC is made by Microchip Technology, derived from the PIC1640. Originally developed by General Instrument's Microelectronics Division. The name PIC referred to "Programmable Interface Controller". PIC16F877A microcontroller is used in the project. PIC Microcontroller is the heart of our system. Entire functioning of this system depends on this board. This data continuously stored on webpage, so users can visit any time and check their consumption. It even reacts as per programed, to the situations like message sending during threshold value etc. Microcontroller is a general purpose device, which integrates a number of the components of a microprocessor system on to single chip. Various microcontrollers offer different kinds of memories. EEPROM, EPROM, FLASH are some of the memories in which FLASH is the most recently developed. Technology used in PIC 16877 is flash technology, so data is retained even when the power is switched off. Easy programming and erasing are some other features of PIC 16F877.

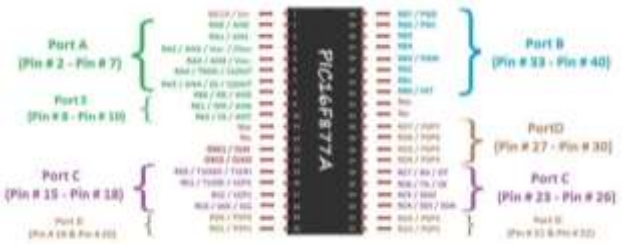

Fig. 2

3) LCD Display:

Liquid crystal cell displays (LCDs) are used in applications where LEDs are used. Some applications are display of numeric and alphanumeric characters in dot matrix and segmental displays. The liquid crystal material is one of the several components, which show optical properties of a crystal though they remain in liquid form. Liquid crystal is layered between glass sheets with transparent electrodes deposited on the inside faces.

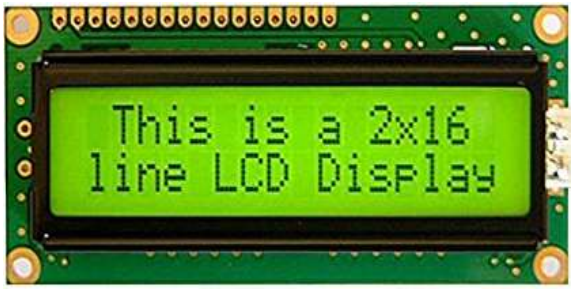

Fig. 3

4) Keypad:

Keypads are Human Machine Interface system and in embedded system they play very important role where human interaction or the human input is required. Matrix keypads are known for their simple architecture and easy interfacing with any microcontroller.

Fig. 4

5) GSM module:

GSM, which stands for Global System for Mobile communications. A GSM modem is a wireless modem that works with a GSM wireless network. The main difference between them is that a wireless modem sends and receives data through radio waves and dial-up modem sends and receives data through a fixed telephone line .A GSM modem is modem which accepts a SIM card, and operates over a subscription to a mobile operator like a mobile phone. A GSM modem exposes an interface that allows SMS to send and receive messages over the modem interface. The mobile operator charges for this message sending and receiving as if it was performed directly on a mobile phone.

In computers use AT commands to control modems. GSM modems support a common set of standard AT commands. These extended AT commands are defined in the GSM standards as Reading, writing and deleting SMS messages, Sending SMS messages, Monitoring the signal strength, Monitoring the charging status and charge level of the battery.

Fig. 5

6) Ultrasonic Sensor:

Ultrasonic ranging module HC - SR04 has 2cm - 400cm non-contact measurement function, the ranging accuracy is 3mm. The modules includes ultrasonic receiver, transmitters and control circuit. The basic principle of work is using IO trigger for at least 10us high level signal, the Module automatically sends eight 40 kHz and detect.

7) Relay Driver:

A relay is an electro-magnetic switch which is a low voltage circuit to switch on and off a bulb connected to the 220v supply. The ULN2003 is a monolithic high voltage and high current transistor arrays. It consists of 7 NPN Darlington pairs that feature high-voltage outputs with common-cathode clamp diode for switching inductive loads. The collector-current rating of a single pair is 500mA. The pairs may be paralleled for higher current capability. Applications are relay drivers, hammer drivers, lamp drivers, display drivers, line drivers, and logic buffers. The ULN2003 has a 2.7kW series base resistor for each pair for operation directly with TTL or 5V CMOS devices.

Fig. 6

8) DC Motor:

DC motors are electric motors using DC power as energy source. These devices converts electrical energy into mechanical energy. The basic principle of DC motors is same as electric motors in general, the magnetic interaction between the rotor and the stator that will generate spin.30RPM 12V DC geared motors for robotics applications. Available in standard size .Nut and threads on shaft to easily connect and internal shaft for easily connecting it to wheel.

B. Software Requirements:

1) MPLAB IDE Software:

MPLAB is a freeware integrated development environment for embedded applications on PIC and PIC microcontrollers, and is developed by Microchip Technology. MPLAB X is the latest model of MPLAB, and developed on the NetBeans platform. MPLAB and MPLAB X helps project management, code editing, debugging and programming of Microchip 8-bit, 16-bit and 32-bit PIC microcontrollers. MPLAB is designed to work with devices such as the MPLAB ICD 3 and MPLAB REAL ICE, for programming and debugging PIC microcontrollers. PIC Kit programmers are supported by MPLAB. This ANSI C compiler integrates with Microchips MPLAB(R) IDE and compatible with Microchip debuggers and emulators.

4. PROPOSED SYSTEM

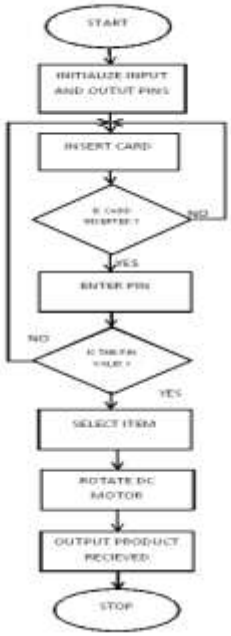

Fig. 7

A. Card Insertion:

The customer approaches the dispensing machine and it is provided with voice support which makes the device User friendly(people of elderly age can also access it easily without technical knowledge).The Smart card with RFID tag is inserted into the RFID reader. Oninsertion the monitor displays the customer's name and the pin must be entered for further process.

B. Information Validation:

The entered pin is validated with the customer database provided by the government which is already preset and if it is valid further process will be carried on. We know that the ration shop can be accessed only by the residents of that area. Thus the information is already fed in the microcontroller memory so it the residents would only be able access the machine.

C. Product:

1) Product availability:

The availability is checked with the help of the ultrasonic sensor. The distance from the insertion point to the base is measured. This product is stacked in the pipe. Thus when a product is purchased this distance increases. And hence the product details are updated regularly.

2) Product selection:

In ration shop the goods bought by a single person is limited (For example 5kg sugar for a person or family). So the products with the quantity would be displayed. On purchasing this amount would be decreasing. Hence the purchase would be limited.

3) Output and SMS:

The products are placed in a pipe like structure. When the customer selects the product the motor is operated, the motor pushes down the product which is present in the base and is received by the customer. On purchasing the product a SMS is sent to both the supplier (i.e., government) and customer that the product is purchased. Hence the supplier knows the product which is purchased and needs to be filled.

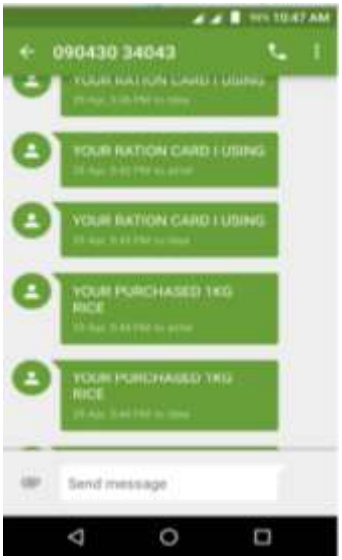

Fig. 8

D. Payment:

Finally the payment is done by the smartcard which is inserted in the RFID reader. Hence there is no hassle in using coins and the exact amount. The smartcard can be recharged (like SIM cards). This method reduces corruption to a greater extend and the machine is available 24*7.

5. RESULTS

By implementing this proposed work, an authorized person would be enabled to buy the ration materials without the intervention of humans. Transparency is achieved and therefore there is a reduction in the corruption. Message will be sent to the government about the dispensing after each item being dispensed and the customer. The person is also limited from buying excess. This feature provides the security and hence the system cannot be operated further.

Fig. 9

6. FUTURE SCOPE

The project can be used at places where the automated ration distribution is required. With certain modification it can be used for automated medicine dispensing also. Used in Food mart. Used for food storing sector. Used in government ration shop.

7. CONCLUSION

In old ration distribution system the ration is not provided to the needy people, the drawback is overcome by our system. After validating Smart card with password the goods are supplied to customer. In this system, ration

Materials (sugar, rice, oil, kerosene) distributed through automatic mechanism without any help of humans. All information detailed in database for the higher authority verification. Proposed system can avoids corruption and solves problems including tampering of the system.

8. REFERENCES

[1]. Dhanoj Mohan, Rathikarani, Gopakumar, "Automation of Ration Shop Using PLC" International Journal of Modern Engineering Research, Vol. 3, Issue. 5, pp. 2971-2977, 2013.

[2]. R.Ramani,S.Valarmathy, "Automatic Ration Material Distributions Based on GSM and RFID Technology", International Journal Intelligent Systems and Applications, Vol. 11, pp. 47-54, 2013.

[3]. S.Valarmathy,R.Ramani,"Automatic Ration Material distributions Based on GSM and RFID Technology," International Journal of Intelligent Systems and Applications,pp.47-54, vol 5, Oct 2013.

[4] C. Chen, R.N.J. Veldhuis, T.A.M. Kevenaar, A.H.M. Akkermans, Multi-Bits Biometric String Generation Based On The Likelihood Ratio, IEEE, 2007

[5] Lucas Ballard, Seny Kamara, K.Michael Reiter, The Practical Subtleties Of Biometric Key Generation, 17th Usenix Security Symposium

[6] K.Balakarthik,"Closed-Based Ration Card System using RFID and GSM Technology,'' vol.2, Issue 4, Apr 2013.