International Research Journal of Engineering and Management Studies (IRJEMS)
Volume: 03 Issue: 03 | March -2019 e-ISSN: 2395-0126

SMART SHOPPING SYSTEM USING RFID

Karra Prathyusha[1], Kuruba Kavya[2], Madduru Naga Sivanee[3], Kothi Bhargavi[4], V.T.Venkateswarlu[5]

[1] *Students of Department of ECE, Vasireddy Venkatadri Institute of Technology, Guntur*
[2] *Students of Department of ECE, Vasireddy Venkatadri Institute of Technology, Guntur*
[3] *Students of Department of ECE, Vasireddy Venkatadri Institute of Technology, Guntur*
[4] *Students of Department of ECE, Vasireddy Venkatadri Institute of Technology, Guntur*
[5] *Associate Professor of Department of ECE, Vasireddy Venkatadri Institute of Technology, Guntur*

Abstract - *Now a day's shopping is becoming a daily activity in cities. We can see a huge rush at shopping malls on holidays and weekends. After total purchase one should approach counter for billing purpose. Cashier prepares the bill by using the existing barcode reader technology, which is a time consuming process. This project presents an idea to build an auto billing system in shopping malls to overcome the aforementioned problem i.e. a smart shopping system which has a features of automatic billing by using an inexpensive RFID tag that can be attached to each product which, when placed in to a smart shopping cart, can be automatically read by a cart equipped with an RFID Reader and displays the total bill on screen. As a result, billing can be conducted from the shopping cart itself, preventing from waiting in a long queue at the checkout. The main aim is to satisfy the customers and also to increase the speed of purchase.*

Key Words: **RFID Reader, RFID Tag, LCD Screen, IOT, ZigBee.**

1.INTRODUCTION

Shopping center is a spot where individuals get their everyday necessities. While shopping, customers usually purchase the Products and place them in their carts and after that wait at the counters for the payment of the bills. This type of payment is a time consuming process because of the existence of barcode code technology. To reduce this time we proposed a system based on RFID Technology. RFID is a non-Contact, automatic identification technology, which uses radio signals to track, identify and detect a variety of objects. RFID system consists of three key elements. They are 1.RFID Tag or Transponder that carries object-identifying data (Unique code). 2. RFID Tag Reader, or Tran's receiver, that reads and writes the tag data. 3. A Backend Database that stores the records associated with tag contents

1.1 Existing System

In shopping malls the currently available method is Barcode method. In this method there are barcode labels on each product which can be read through specially designed barcode Readers. This system uses manual billing process.

Fig -1: Existing system

Disadvantages

- Manual Billing
- Use Barcode for billing
- Human stuff is needed for billing purpose

1.2 Proposed System

In proposed system we have implemented the system completely to transfer the data successfully to the billing session. In this system we are using RFID Reader and Zigbee to transfer the data. This system has features of automatic billing system by using RFID Technology.

Advantages

- Automatic billing
- Use of RFID Tags for billing
- No need of any staff for billing
- Product information can be obtained easily

2. Block Diagram

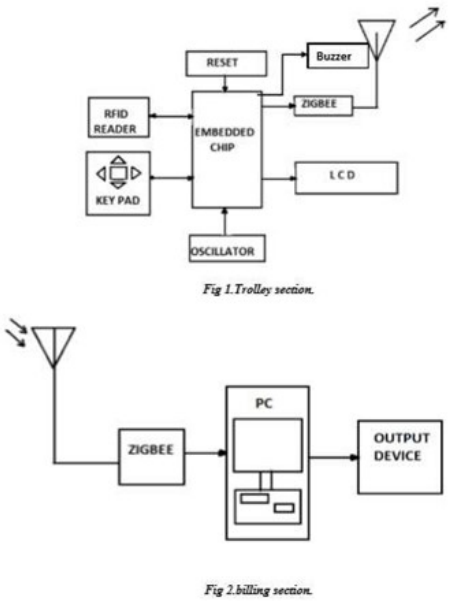

Fig -2: Block Diagram

Block diagram consists of two sections 1.Trolley section, 2.Billing section. In the trolley section each product information is displayed on the LCD screen and that information is transferred to billing section through Zigbee module. In the billing section the collected information is displayed on central billing system so that customer can pay the bill directly.

3. Hardware Requirements

- Arduino
- RFID Reader
- RFID Tag
- LCD Module
- Buzzer
- Zigbee module

Arduino

The Arduino is an open-source microcontroller board based on the Microchip ATmega328 microcontroller and developed by Arduino.cc This Arduino Micro Controller is simple to use, it has many sorts like UNO, MEGA and various others. Here we use Arduino UNO board. The Programming in Arduino is either C/C++. The Arduino has inbuilt program to check whether it is working or not. The biggest advantage of Arduino is its ready to use structure and also its library of examples present inside the software of Arduino.

Fig -3: Arduino Board

Another advantage of Arduino is is its automatic unit conversion capability.

RFID Reader

A Radio frequency identification Reader (RFID Reader) is a device used to gather information from a RFID Tag. The tag responds only when the Reader emits radio waves.

Fig -4: RFID Reader

RFID Tag

RFID Tag is an object that can be applied to a product for the purpose of identification and tracking using radio waves. The RFID tag must be within the range of an RFID reader, which ranges from 3 to 300 feet. There are two main types of RFID Tags: Active RFID Tags which ha own power sources and Passive RFID Tags which receives its power from reading antenna.

Fig -5: RFID Tags

LCD

A liquid-crystal display (LCD) is an electronic display module and find a wide range of applications. Here we use 16x2 LCD Display which is very basic module and is very commonly used in various devices. This LCD is for displaying purpose of various product details like name of the product, cost and also the total amount.

4. Methodology

Each product has an RFID tag which contains a Unique ID and each Trolley is equipped with RFID Reader, LCD and Zigbee module. Whenever the product is dropped into the cart the Reader reads the tag and this information is displayed on the LCD Screen.

If a particular product has to be removed from the trolley, then the customer needed to scan the same product again. The total amount of purchases is also displayed on screen. Then the customer can directly pay the bill and leave.

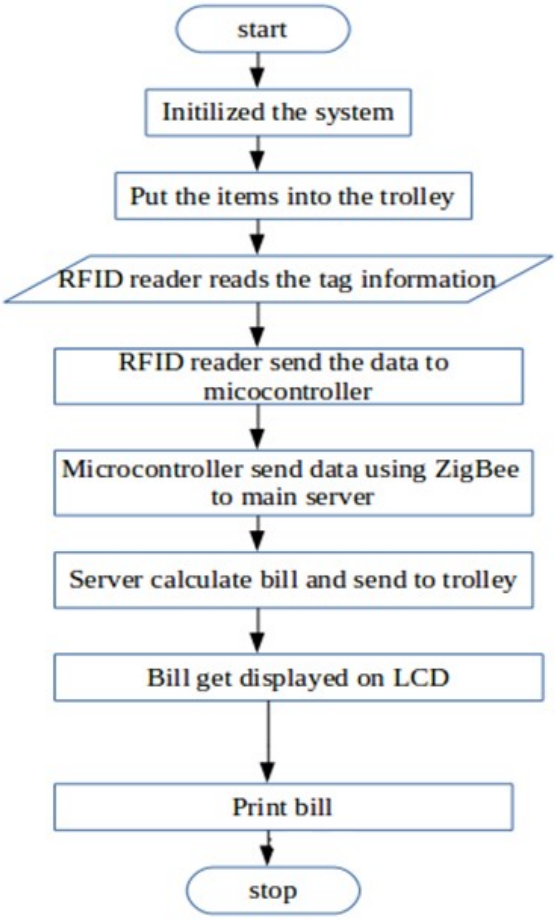

Fig -6: Flowchart

Result

Using the Proposed Methodology, we have connected the Hardware components as shown in below figure and code is written in Arduino Software. After that this code is compiled first and later run. This Output is observed in Serial Monitor as well as LCD Screen.

Fig -7: Display of product on LCD

5. Conclusion

This project demonstrates the possibility of developing a Smart Shopping System which automates the entire billing procedure. This innovation payment method avoids the long waiting time. By knowing the billing details in advance customers can do affordable purchase. It improves the speed of purchases and also reduces the Human staff for billing.

References

1. Dr. Suryaprasad J, Praveen Kumar B, Roopa D & Arjun A K "A Novel Low-cost Intelligent Shopping Cart", 2014 IEEE.
2. Amine Karmouche, Yassine Salih-alj, "Aisle-level Scanning for Pervasive RFID-based Shopping Applications", 2013 IEEE.
3. Bill McBeath, the Explosion of Retail Item-Level RFID: A Foundation for the Retail Revolution, April 2013.
4. R. Kumar , K Gopalakrishna, and K. Ramesh, "Intelligent shopping system".
5. Martin Mayer, Nobert Gortz and Jelena Kaitovic, "RFID Tag Acquisition via Compressed Sensing", 2014 IEEE.