Smart Shopping Trolley With Automatic Billing System Using Rfid And Zigbee Technique

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Abstract— A shopping mall is a place where the people buy the products for their regular use. After purchasing their products, they want to wait in a long queue to collect their bill. To avoid these issues, we have developed a product for automatic billing system. In this product the bill can be automatically calculated in the trolley itself with the help of RFID and Zigbee technique. The calculated bill can be displayed on the LCD display and it can be automatically transmitted to the central server system. And also, with the help of this trolley the customer can easily identify the place of the product with the help of the LCD display. The main aim of this paper is to provide an automatic billing system and make the shopping easy and flexible.

Keywords— RFID (Radio Frequency Identification), ZigBee, LCD display, ARDUINO, Central Server Database.

I. INTRODUCTION

Shopping is one of the important part of our life. All human beings want to buy something according to their needs. The shopping is mostly done in shopping malls and super markets. People are mostly like to go such kind of places. Due to this we can see huge rush in shopping malls on weekends and holidays. After purchasing their products people have to go to collect their bill in billing section. In billing section, cashier prepare the bill by scanning the barcode of the product. Due to this process we can see long queue near the billing section. It takes more time and customer feels irritate. This Smart Shopping Trolley makes the shopping too easy. In this trolley the bill can be automatically calculated in the trolley itself with the help of RFID and Arduino. Instead of bar code, all the things in the shopping malls will be transistorized with RFID tag. When the customer places their product inside the trolley it will automatically scanned by RFID reader and it will be displayed on the LCD display. The display can display individual product amount, quantity and the total bill amount. In this system, the customer need not scan the product in front of scanner. When the customer places the product in any direction it will automatically scanned by the reader. Then the total bill amount will be transmitted to the central server system with the help of ZigBee. Thus, the same thing will be displayed on the central server system in order to make sure about the total amount and bill.

II. RFID TECHNOLOGY

RFID stands for Radio Frequency Identification. RFID is advanced than barcode technology. We can use RFID numbers instead of bar codes. The barcode will be scanned if and only if it is placed under the scanner properly. But it is rectified by RFID scanner. The range up to which the reader read the RFID number is 3m. Thus, the RFID known as advanced than barcodes. In this paper we have used RFID tag on the product and the RFID reader in the shopping trolley. Hence, if the people are inserting the product inside the trolley means it will read the data which are stored in the tag. The micro range RFID tag measures 0.01 inch and consists of 128-bit serial memory. And also measures 0.01 inch and consists of 128-bit serial memory. And also, these type of RFID tags have the 3-5 years of lifetime.

There are two types of RFID tags are available in the market namely Active RFID and Passive RFID. If the power is internally supplied to the tag then it is known as active RFID, If the power transmitted to the tag by means of reader then it is known as passive RFID. The passive RFID tags are more economical

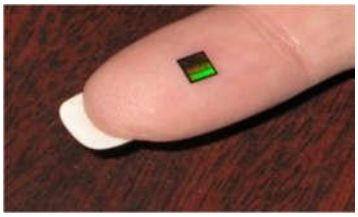

Fig.1 micro level RFID tag

RFID utilizes the radio frequency in order to receive and transmit the data. The RFID tag consists of IC chip and antenna. The IC chip is used to store the data and information's whatever we are providing. The antenna is used to transmit those data to the reader. This is the function of RFID tag. The RFID converts these radio signals into readable data. This is how the RFID works.

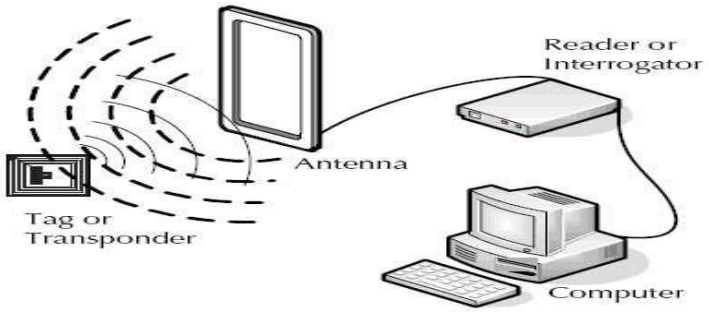

Fig.2 How RFID works

III. ZIGBEE TECHNOLOGY

The wireless data transfer is possible by ZigBee. The data is transferred from the Arduino to central server system by means of ZigBee transmitter. The ZigBee receiver will be inserted in the system through which the data is received. The ZigBee device is also works with the help of radio waves. Instead of Bluetooth the ZigBee is used. It improves the efficiency and also the response time. It consumes very low power and used to make personal area network. This can be used in home automation and data collection. This ZigBee can be used to up to 2400 MHZ.

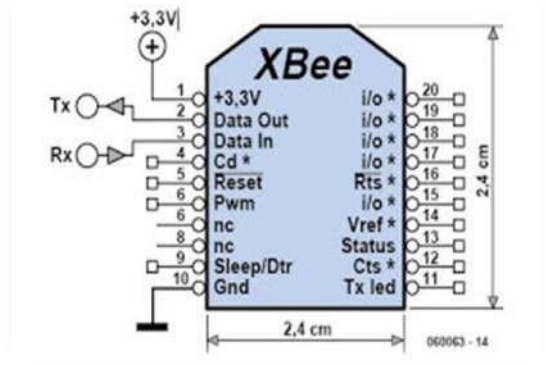

Fig.3 Pin Diagram for Zigbee

IV. BLOCK DIAGRAM

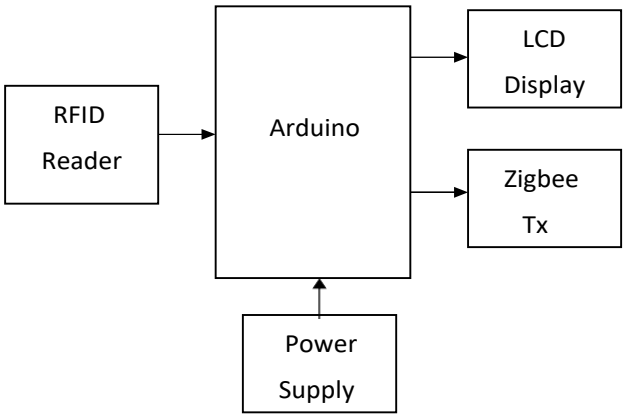

Fig.4 BLOCK DIAGRAM FOR TRANSMITTER

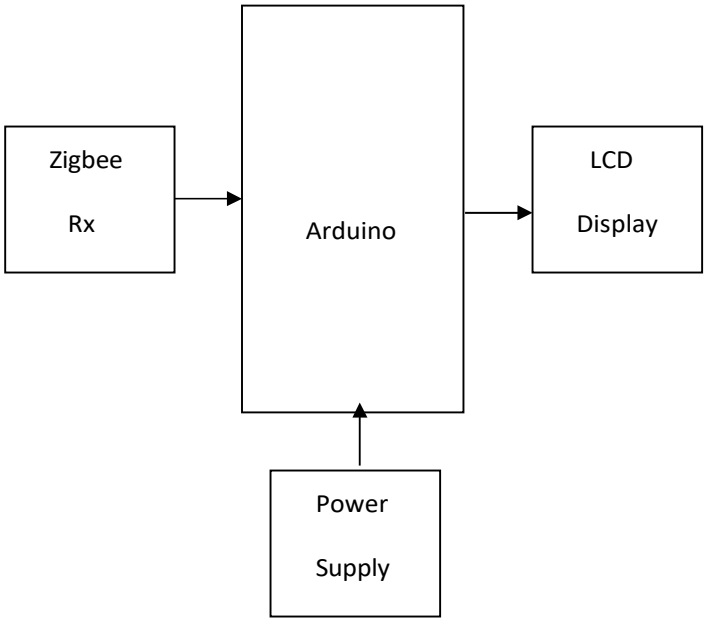

Fig.5 BLOCK DIAGRAM FOR RECEIVER

The following figure shows the general block diagram of this paper. The RFID tag will be attached to the product. It is read by the RFID reader which is placed in the trolley. The setup also consists of 16X4 LCD display and Arduino. Arduino is used to make the sum and subtraction. Also make the ZigBee to transmit the data. In this display the product which we are buying, the total amount of bill and the path will be displayed. After that the signal is transmitted to the central server system by means of ZigBee. In the central server system, the same thing will be displayed along with the cart number. This reduces the man power as well as the labor cost. Also, it doesn't need well trained people to operate.

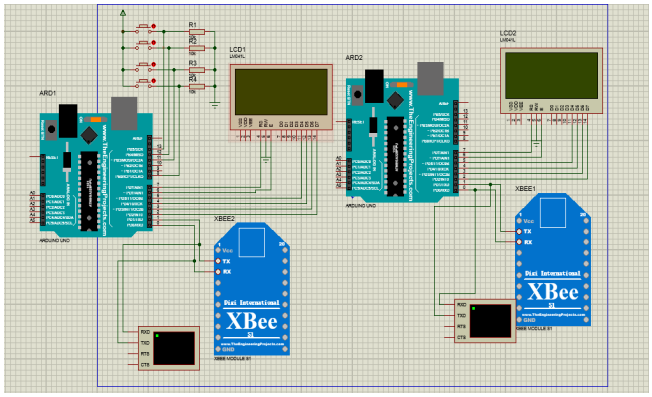

Fig.6 Simulation of Smart shopping trolley using Arduino and RFID

The path way for the required item will be displayed in the LCD display. When the customer chooses the item to know where it is placed, then the display will display the pathway. The advantages of this paper is that it will reduce the time consumption, reduced man power. It will reduce the labor cost. As the components are cheap the overall cost of the product will be reduced.

VI.CONCLUSION

Now a day's people are going to shopping malls for purchasing as well as to enjoy. So if it consumes more time for getting bill makes the people to get irritation. Hence this proposed product will reduce the time consumption to make the people to feel better while shopping.

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[2] Global Journal of Advanced Engineering Technologies Volume 5, Issue 4- 2016 ISSN (Online): 2277-6370 & ISSN (Print):2394-0921 RFID BASED SMART TROLLEY FOR AUTOMATIC BILLING SYSTEM 1Rachana Doshi, 2Amrita Sutar ,3 Sonali Aher, 4Sanvida Dalvi ,1,2,3,4Computer Department, K.J. College of Engineering Management&Research, Savitribai Phule Pune University, Pune, India.

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