Scientific Journal of Impact Factor (SJIF): 5.71

e-ISSN (O): 2348-4470
p-ISSN (P): 2348-6406

International Journal of Advance Engineering and Research Development

Volume 7, Issue 05, May -2020

Smart Trolley for Fraud Detection

[1]Bhujbal Mayuri, [2]Deshpande Bhakti, [3]Parkhi Priyanka, [4]Gaikar Priyanka

Department Of Computer Engineering, Anantrao Pawar College of Engineering, Parvati, Pune.

Abstract —*Nowadays instead of roaming in different shops for different products people prefers a supermarkets where we get all the daily necessities at the same time. Supermarkets provides availability of the products and saves time at the same time. Obviously customers have to wait in the long queues for the billing purpose so they get frustrated. We have to face lots of rush during weekends or if there is special discount or offer. In this era of super technologies we have developed an application to overcome this problem. we have designed a smart trolley in which RFID scanners and RFID tags are used. RFID tags are on products are automatically scanned with RFID readers whenever a product is placed into a trolley. The count is displayed on the LCD screen. A Buzzer alarm is used to detect a fraud. After all the shopping is done we have to choose payment method and once the payment is successful we will get a notification indicating payment is successful.*

Keywords: *RFID Tag, RFID Reader, Bluetooth, LCD Display, Mobile Application, IR Sensor, LCD Display, AURDUINO.*

I. INTRODUCTION

Shopping mall is a place where we can expect our all the daily necessities food, clothes etc. In malls for purchasing these things we require trolley. We cannot even stand during the rush time in malls for this. Due to heavy rush during weekend we have to face long queues which are present for billing purpose.Customers gets frustrated. Shopping in malls would be easy if billing purpose would not be time consuming. We are designing an application which builds smart trolley. The main aim of this smart trolley is to build a system that will help the customers to save the time and manage their budgets within fraction of seconds. Navigation for items inside the store is done in this application. An ARDUINO microcontroller is used. Buzzer is used to detect a fraud or if you are purchasing beyond the budget which was set by you. RFID tag is attached to the product which will be scanned by the RFID scanner during purchasing. You can add budget in application according to availability of money. System will retrieve all the essential details of the products and generates a bill. The bill is sent to the customers mobile so that he can choose payment method. After successful payment a notification is displayed on the screen.

1. PROBLEM INGREDIENTS:

In this, User login into system then system will display best selling products. System also provide recommendation to user. User search required product in to database. System send product location to user. The customer place RFID tag of product near to RFID readerto add product into digital cart while making purchase, retrieve essential details of all products from shops database and generate bill. This bill can be sent to the customer's mobile through online banking service thus the user can make quick payment and leave the shop early. User can give rating to products and also view the rating of product. The customer place RFID tag of product near to RFID reader to add product into digital cart and move to the digital cart if they are interested in choice of item by using the proposed mobile application.

2. PRODUCT PERSPECTIVE:

In this system to reduce complexity we are using RFID Tags instead of Barcode .For every product their is separate RFID Tag in a mall. Each trolley will contain RFID Reader on it. The Bluetooth module is implemented on each trolley. Controller is used for storing purpose. LCD will display count of product purchased by the customer. If product is removed by the customer then updated count is displayed on LCD. To avoid any kind of fraud we are using BUZZER..

3. GOALS AND OBJECTIVES:

Goals:

Propose system will reduce the time require for purchasing the product in mall. Propose system suggest the product location to the user. Add product into cart by scanning product by the RFID Reader. Payment of purchased product is done online or by cash. This will reduce the time for purchasing product. Also save the energy of both i.e. customer and shopper. Also provide recommendation to user, user can view product information and view or provide rating to products.

Objective:

- To reduce time required for purchasing product
- Notify the product location

- Minimize efforts require for billing system.
- Provide recommendation to user.
- User can view and provide rating to product.
- Fraud Detection.
- Display best selling products.

4. SCOPE:

Scope of our project is as follows:
Propose system effectively used in shopping mall for notify towards expected product. It also reduce efforts of customer and shopper at the same time of bill amount. Propose system could be used in shopping mall for billing purpose. Propose system could be used in canteen, market, for selecting food, vegetables, fruits and bill payment. Propose system could be used for product recommendation and review ratings.

5. MOTIVATION:

Customer's benefit:
It is beneficial for customers to see the on spot scanning of purchased products. Budgets as well as number of products on the LCD. Customers also understand that if we are purchasing within budget or not. This saves the time of customers and helps to leave mall early.

Benefit for the supermarkets:
The system is developed using RFID tags and scanners. RFID scanners scans the products as soon as the product is placed into the trolley. This saves the efforts of the laborers.

ARDUINO:
ARDUINO microcontroller is used for this implementation. ARDUINO using system is less bulky because it can transfer data from one place to another very easily. It is easy to communicate between inputs and outputs as well as ARDUINO requires less power supply. ARDUINO provides complete access to functions of microcontroller so that we can communicate with the help of input output pins and we can program the controller.

Less cost:
Since we are using RFID scanners and RFID tags instead of Barcode system the system is much user friendly are requires less cost to design.

II. LITERATURE REVIEW

In[1] , using ZIGBEE and RFID a communication between centralized and automated billing system is employed. RFID tag is mounted on every product,so that the reader can identify and catch the information of product. The information of purchased items is read through a RFID reader and the information is sent to the billing counter using ZIGBEE module. This information gets added to the product Database and calculates total amount of purchasing of a particular product.This system is focused on reducing queue in a store.
In[3], This Smart Shopping Trolley application creates automated billing system for malls by using PID the customer need not wait in a queue for the longer time. The product information is directly transferred to billing system. Customer can pay online. The system is time effective.
In[4], This smart Shopping System using RFID develops a low-cost intelligent shopping System which assists the customer to location and selection of product and provide information on the product/s details dynamically as they move in the shopping arena. Also identification of each product is unique and usage of centralized server, support billing and update in inventory.
In[6], This Indoor WIFI positioning System Develops an enhance WIFI positioning system based on fingerprint method to minimize orientation effect of mobile phone the system uses orientation based look-up table.

III. EXISTING SYSTEM

Manual shopping is the traditional way of shopping in which customers have to wait in the long queues during rush hours. It is very tedious task so customers gets frustrated.This consumes lot of time of the customer as well as cashier.

IV. PROPOSED SYSTEM

User The proposed system contains two modules
1. Hardware
2. Android application

Java language is used for the development in android software.

It uses three sensors
1. IR sensor
2. RFID tag
3. RFID reader which helps to build a hardware for the trolley.

4.1. ADVANTAGES OF PROPOSED SYSTEM:

- Propose system reduce the user shopping time
- Provide the navigation to user for better experience of shopping
- RFID taghelps to identify product uniquely.
- Users can explore more products.
- For fraud detection buzzer is used.

V. SYSTEM ARCHITECTURE

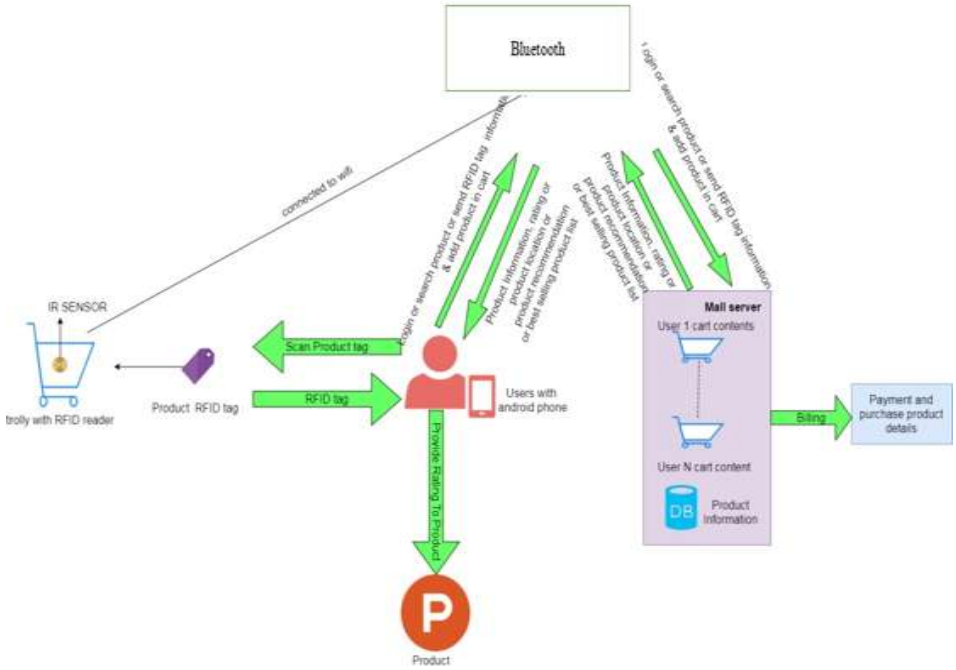


Fig1. System Architecture

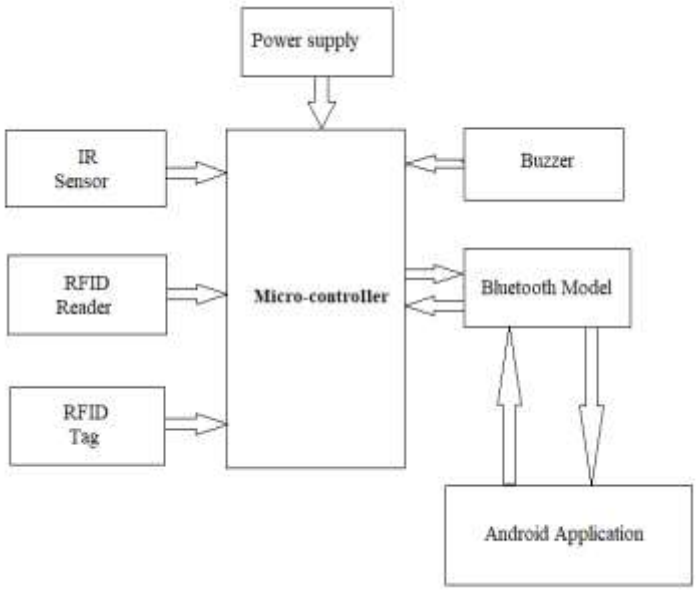


Fig2. Block Diagram

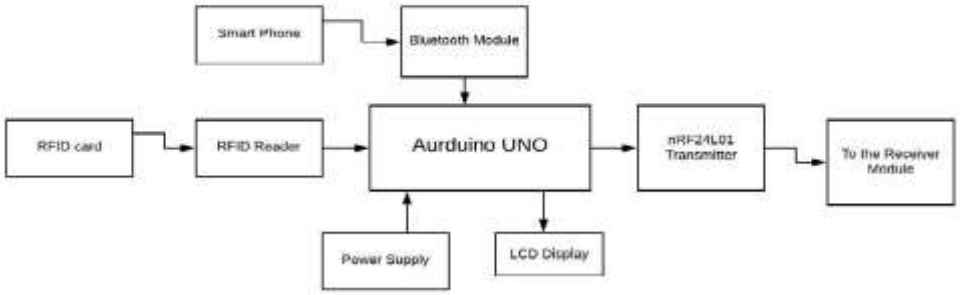


Fig3.Block Diagram of Transmitter Model

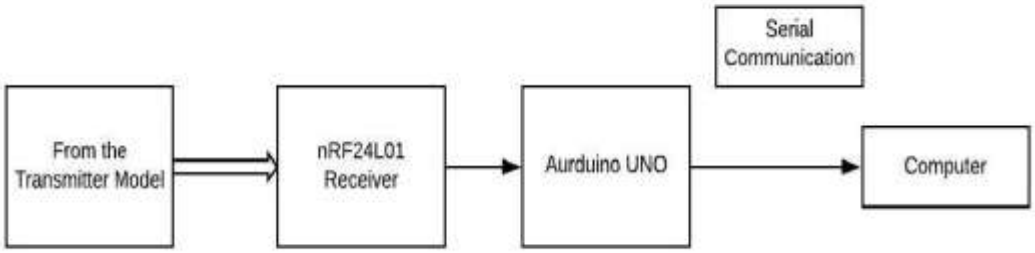
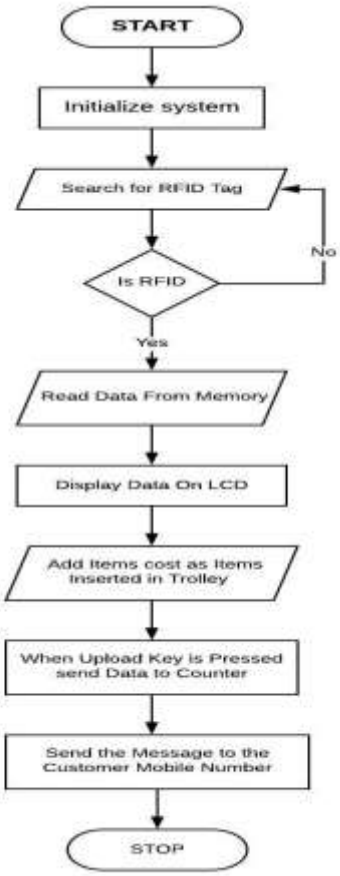


Fig4.Block Diagram of Receiver Side

FLOWCHART



VI. SYSTEM DESCRIPTION

In this system we are using RFID Scanner and tags instead of barcodes. RFID tag is attached with the product. LCD is attached to the shopping trolley. Once product is placed into the trolley the scanner which is attached to trolley scans the product and acts accordingly with the prices and the decided budgets. Customer has to download the mobile application. Mobile application helps to navigate through the products to the customers. Bluetooth module is used for the data transfer between inputs and outputs instead of WIFI. ARDUINO provides complete access to functions of microcontroller so that we can communicate with the help of input output pins and we can program the controller. A buzzer is used if a fraud is detected or if you are running out of budget .Once you are done with the shopping then you have to choose payment option and have to pay online so this saves the time and efforts of the customer in the mall.

VII. SYSTEM DESIGN:

7.1. Methodology:-

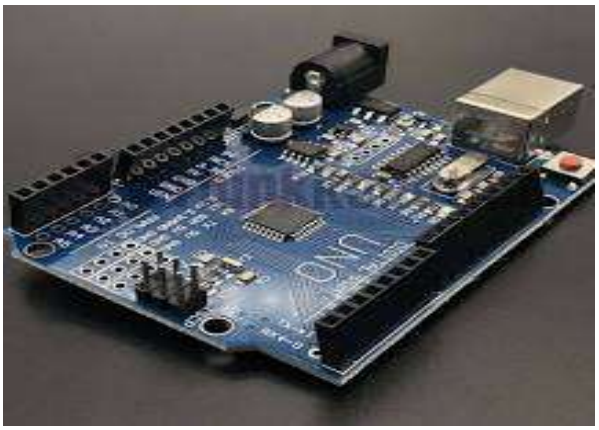
System is developed with the Arduino microcontroller. Customers have to download a mobile application to purchase the products with the smart trolley. This application also guides you through navigation of products and also you can add budget. IR sensors are also used which uses transmitters and receivers for the data communication. This data is sent to the microcontroller for the further processing. You have to pay for the products with the mobile application only.

7.1.1SOFTWARE DESIGN:

7.1.2. HARDWARE DESIGN:

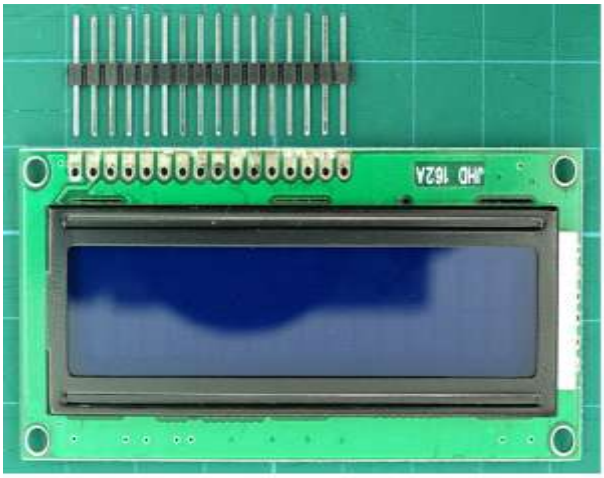
7.2. COMPONENTS OF Fig:

7.2.1. MICROCONTROLLER:



ARDUINO is an open source microcontroller. It is based on ATmega328p.This board of microcontroller is equipped with the digital and analog pins. These digital and analog pins can be interfaced to various expansion circuits. We can connect it to a computer with the help of USB cable .ARDUINO are used at the Transmitter and receiver side.

7.2.3. LCD DISPLAY:



20*4 size LCD display is used in this project. It means that we can display 20 characters and 4 rows in it. A liquid crystal display is used for displaying the count of products. Budget and description is also displayed on the LCD. LCD is attached to the trolley for the customer's use.

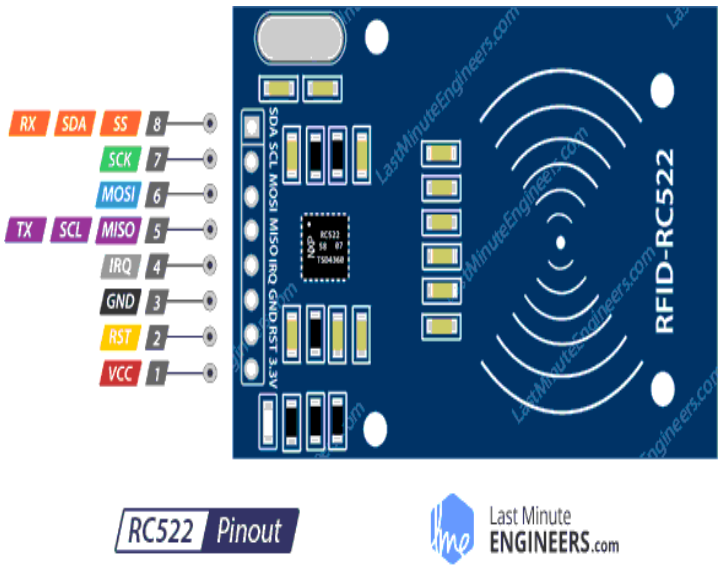
7.2.4. RFID READER:

RFID readers catches the information of the RFID tags through antenna. It contains RF module that is transmitter and receiver of radio frequency signal. There are fixed and mobile RFID readers in which fixed readers are not portable and they are permanently mounted on walls. On other hand mobile readers are portable as well as handheld device for RFID tags.

7.2.5. RFID TAGS:

RFID Tags woks like Barcode scanning system to identify items. The data is transferred through radio frequencies from tags to reader. It is used for transmitting and receiving information.

7.2.6. RFID READER:



RFID readers catches the information of the RFID tags through antenna.It contains RF module that is transmitter and receiver of radio frequency signal.There are fixed and mobile RFID readers in which fixed readers are not portable and they are permanently mounted on walls. On other hand mobile readers are portable as well as handheld device for RFID tags.

7.2.8. BLUETOOTH MODULE:

It is a wireless technology which is connected to phones or other equipment. Bluetooth covers short distances.

VIII.CONCLUSION AND FUTURE WORK

In this project "SMART TROLLEY FOR FRAUD DETECTION", name suggest that billing technique is improved. As compared to regular billing technique this system is less time consuming. Supermarkets can use this idea to increase the productivity so it is beneficial to customers as well as employees. It is more reliable. Here we conclude that the proposed system is time saving.

REFERENCES

[1] Mr.P.Chandrasekar, Ms.T.Sangeetha, "Smart Shopping Cart with Automatic Central Billing System through RFID and ZIGBEE", IEEE twelfth International Conference, 2014.

[2] Prof. SeemaVanjire, UnmeshKanchan, Ganesh Shitole, PradnyeshPatil, "Location Based Services on Smart Phone through the Android Application" International Journal of Advanced Research in Computer and Communication Engineering Vol. 3, Issue 1, January 2014

[3] Suk-Hoon Jung, Gunwoo Lee, and Dongsoo Han, "Methods and Tools to Construct a Global Indoor Positioning System", IEEE TRANSACTIONS ON SYSTEMS, MAN, AND CYBERNETICS: SYSTEMS

[4] Komal Ambekar, Vinayak Dhole, supriya sharma, Tushar Wadekar, "SMART SHOPPING TROLLEY USING RFID," International Journal of Advanced Research in Computer Engineering & Technology (IJARCET) Volume 4 Issue 10, October 2015.

[5] Siti Fatimah Abdul Razak, Choon Lin Liew, Chin Poo Lee, Kian Ming Lim, "Interactive Android-Based Indoor Parking Lot Vehicle Locator Using QR-code", 2015 IEEE Student Conference on Research and Development (SCOReD)

[6] Da Su, Zhenhui Situ, Ivan Wang-Hei Ho, "Mitigating the Antenna Orientation Effect on Indoor Wi-Fi Positioning of Mobile Phones", 2015 IEEE 26th International Symposium on Personal, Indoor and Mobile Radio Communications - (PIMRC): Services Applications and Business

[7] Thomas Willemsen, Friedrich Keller, Harald Sternberg, "Concept for building a MEMS based indoor localization system", 2014 International Conference on Indoor Positioning and Indoor Navigation, 27th-30th October 2014

[8] Chi Zhang, Kalyan P. Subbu, Jun Luo, and Jianxin Wu, "GROPING: Geomagnetism and cROwdsensing Powered Indoor NaviGation", IEEE TRANSACTIONS ON MOBILE COMPUTING, VOL. 14, NO. 2, FEBRUARY 2015

