Secure e-cart for Automatic billing using RFID and zigbee

Minor Project under the guidance of:

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CONTENT

- Aim and Objective
- Introduction
- Literature Survey
- Proposed methodology and flowchart
- Advantages
- Future scope
- Conclusion
- References

AIM AND OBJECTIVE

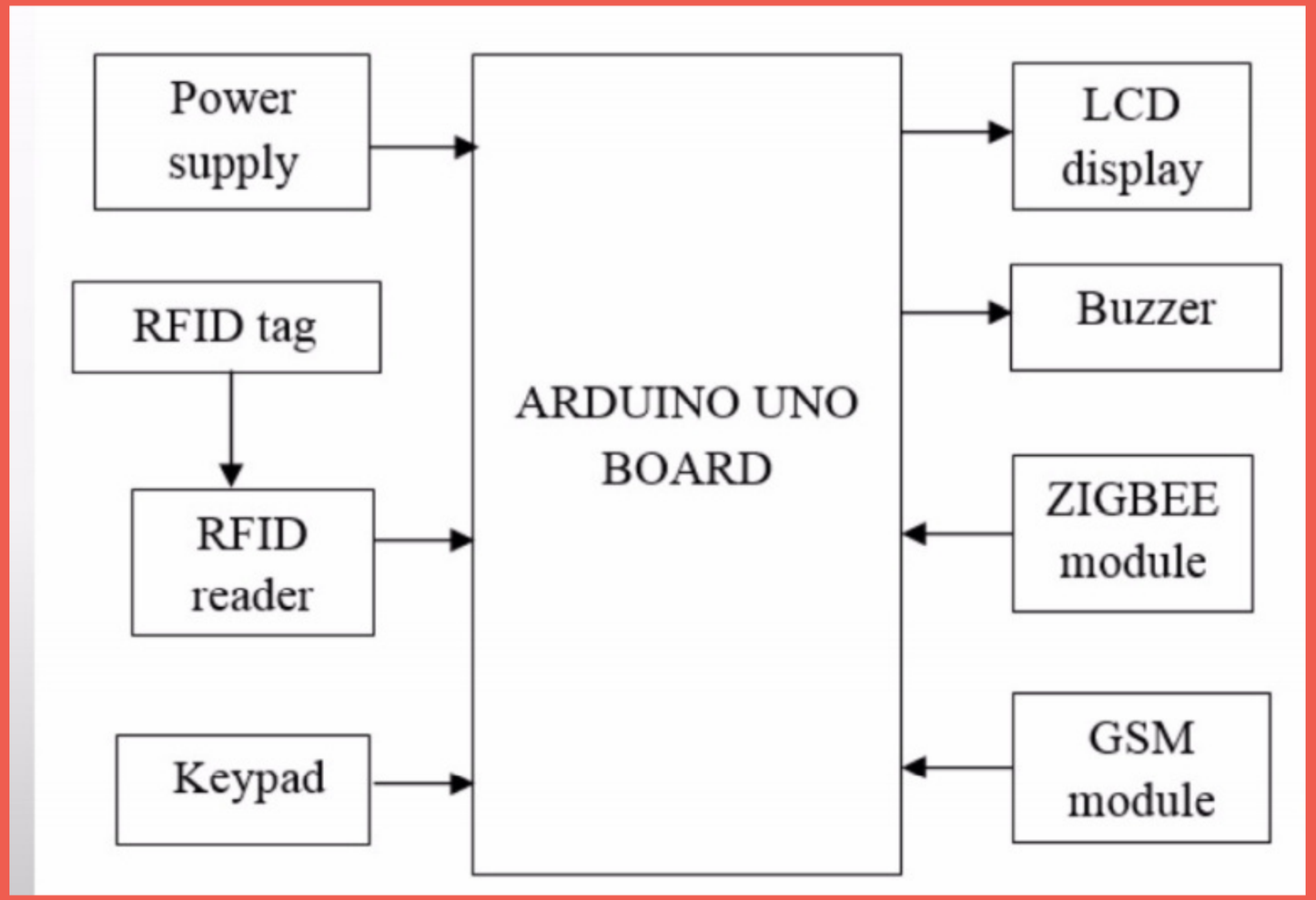
- The aim of this project is to make our shopping easier by using the RFID tags which are attached to each project in shopping market .
- To save time at billing counter.
- To pay the bill within the cart using RFID ATM card, so you'll get the SMS of the bill amount.

INTRODUCTION

- The purpose of this project is to provide centralized and automated billing system using RFID and Zigbee communication. The emergence of RFID makes the traditional retail process faster, transparent and efficient.
- Each product in shopping mall will be supplied with an RFID tag to identify its type and every cart will contain a board .
- The board contains Arduino board , LCD display ,RFID reader ,Zigbee module,GSM module , Buzzer keypad .
- The centralized database will give the product information on the LCD screen present on the shopping cart and It’ll make the billing process faster.

CENTRALISED BILLING SYSTEM REPRESENTATION

BLOCK DIAGRAM



LITERATURE SURVEY

1. **Smart Shopping Cart with Automatic Billing System through RFID and ZigBee.**

AUTHOR : Mr. P. Chandrasekar and Ms. T. Sangeetha

ANALYSIS: This application creates an automated central bill system for the mall. Customers can pay their bills through credit/debit cards. ZigBee and RFID are used in it.

2. Novel Model for Automating Purchases using Intelligent Cart.

AUTHOR : Ms. Vrinda and Ms. Niharika
ANALYSIS: This paper provides an idea of LCD use for offers, discount, and total

3. The RFID based Smart Shopping Cart.

AUTHOR : Ms. Rupali Sawant, Kripa Krishnan, Shweta Bhokre and Ms. Priyanka Bhosale.
ANALYSIS: This paper provides an idea of using a mobile for paying the bill via different mobile apps.

4. Electronic Shopping Cart for effective shopping based on RFID.

AUTHOR : Ms. Kalyani Dawkhar, Shraddha Dhomase and Ms. Samruddhi Mahabaleshwarkar.

ANALYSIS: This paper concludes that the time required for billing in the shopping malls is cut down in self scanning.

5. RFID based Smart Shopping and Billing.

AUTHOR : Zeeshan Ali and Reena Sonkusare.
ANALYSIS: In this paper more utilization of LCD like removing the item by cancel button on LCD implemented.

6. Intelligent Shopping Cart.

AUTHOR : Raju Kumar, K. Gopalakrishna and k. Ramesha.

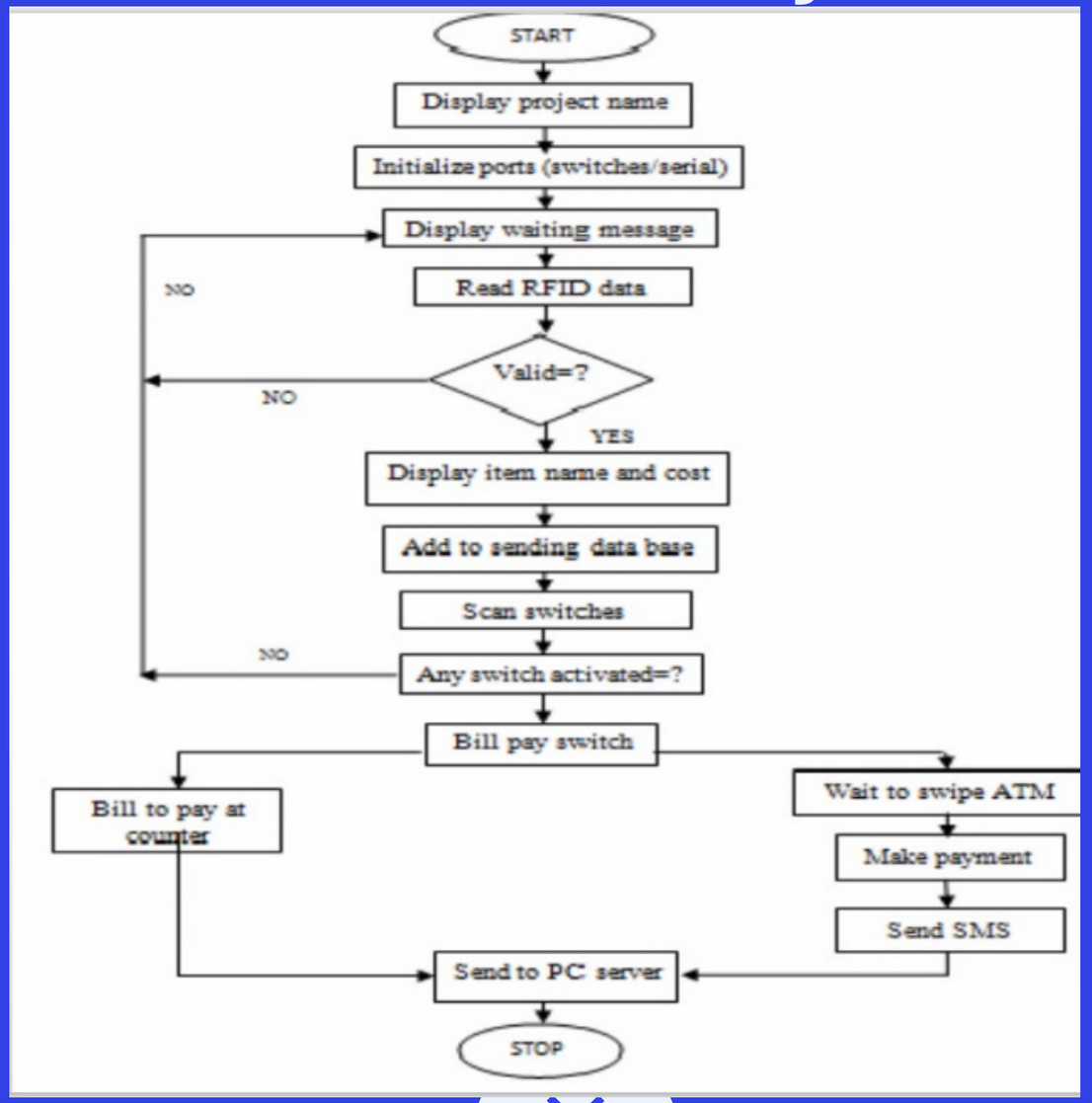
ANALYSIS: It explains how to access real time information about the diverse product inside the shopping cart.

Limitations

The major limitation that was found after research and reading all the papers was that it lacks the element of security so keeping that in mind we have made a cart which is both user friendly and secure .

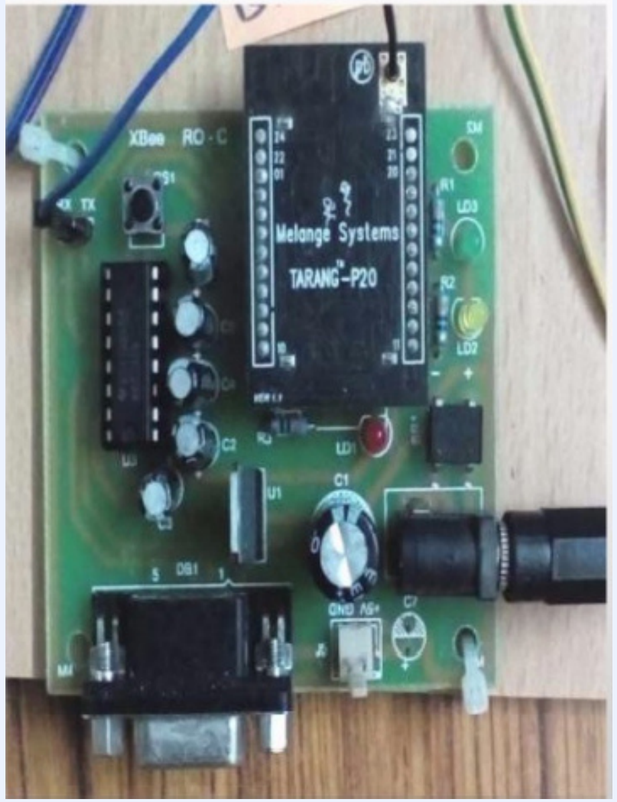
PROPOSED METHODOLOGY

Flowchart on How the Project works:



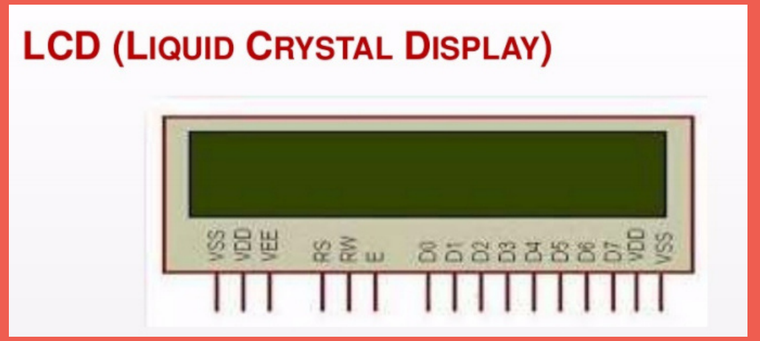
STEP 1

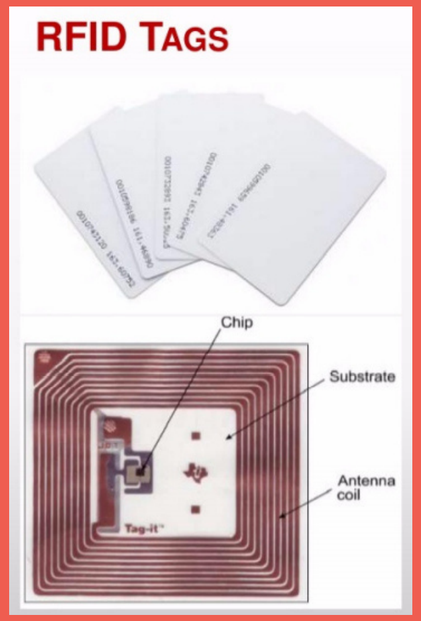
Switch on the power supply of the hardware kit. Connect the zigbee module to the computer through USB cable. Open the library which was installed in the authorized computer and select the COM port.



STEP 2

The LCD in the hardware displays "welcome to trolley billing" after some delay it displays "waiting for the items" then add the items to the cart by keeping RFID card near the RFID reader then product information is displayed in the LCD display





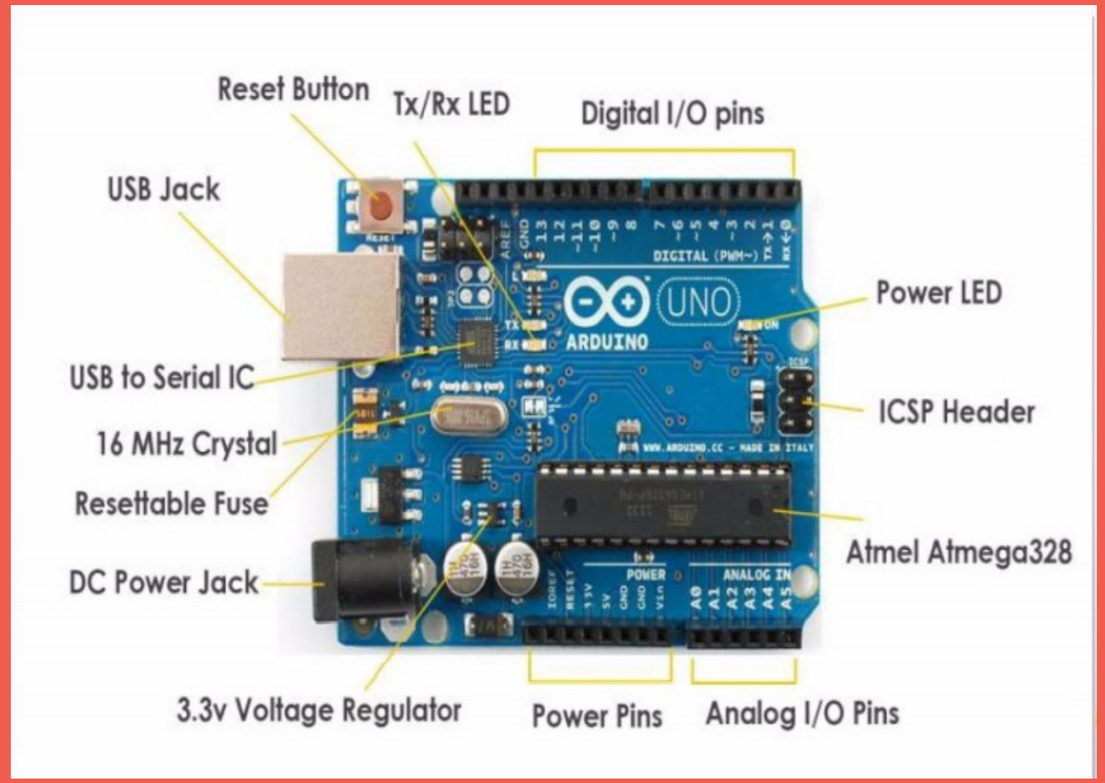
STEP 3

While adding the items we can delete an item by pressing the delete switch in the keypad. Then LCD displays as "remove an item" then remove the item.

STEP 4

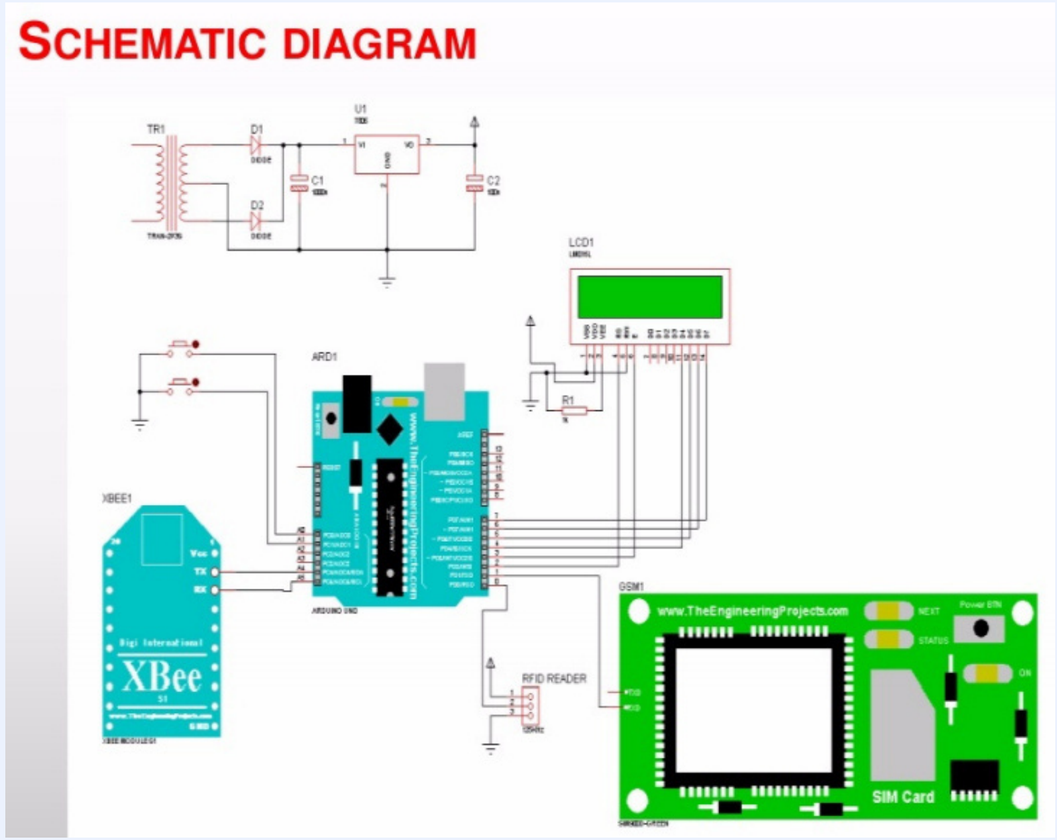
After the completion of adding items to the cart press the save switch. Now we will get two options in the LCD display : "1. pay using ATM card and 2.billing".

If you want to pay bill using RFID ATM card press switch 1 otherwise press switch 2.



STEP 5

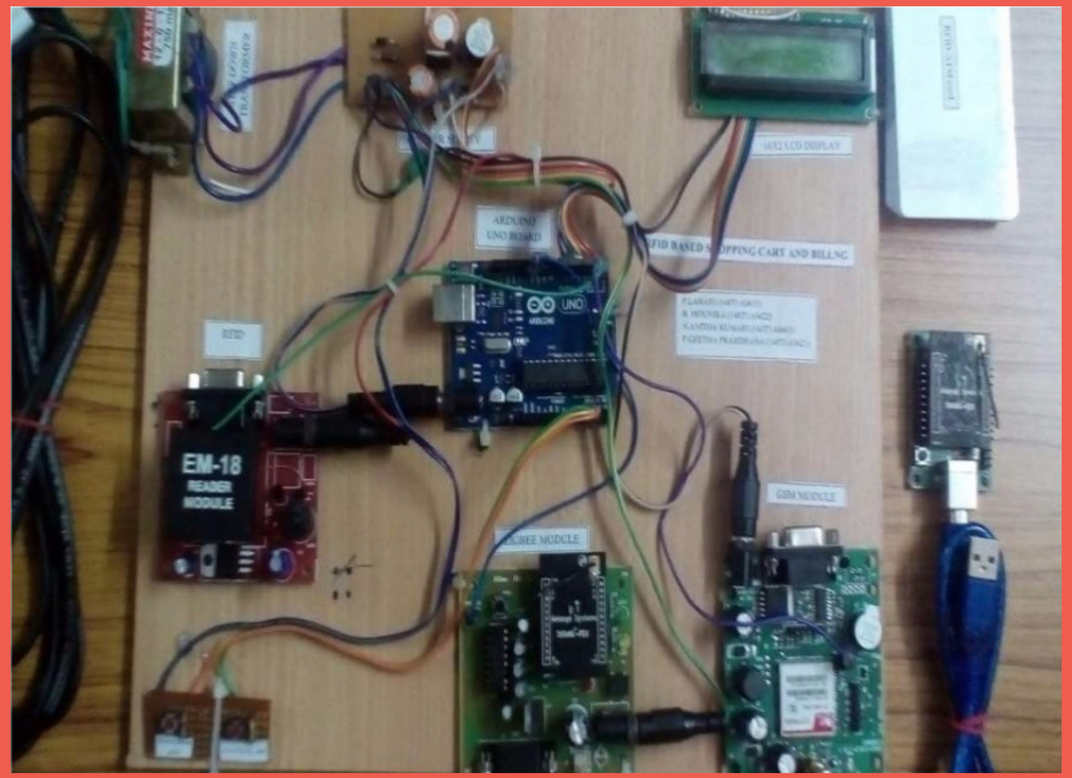
When you press switch 1 swipe the RFID ATM card then we will get the OTP via SMS and after entering the OTP the bill amount will be deducted from account and at the billing section also we can see status as bill paid.
When you press switch 2, at the billing section we can see status as pay the bill, then we have to pay amount through cash

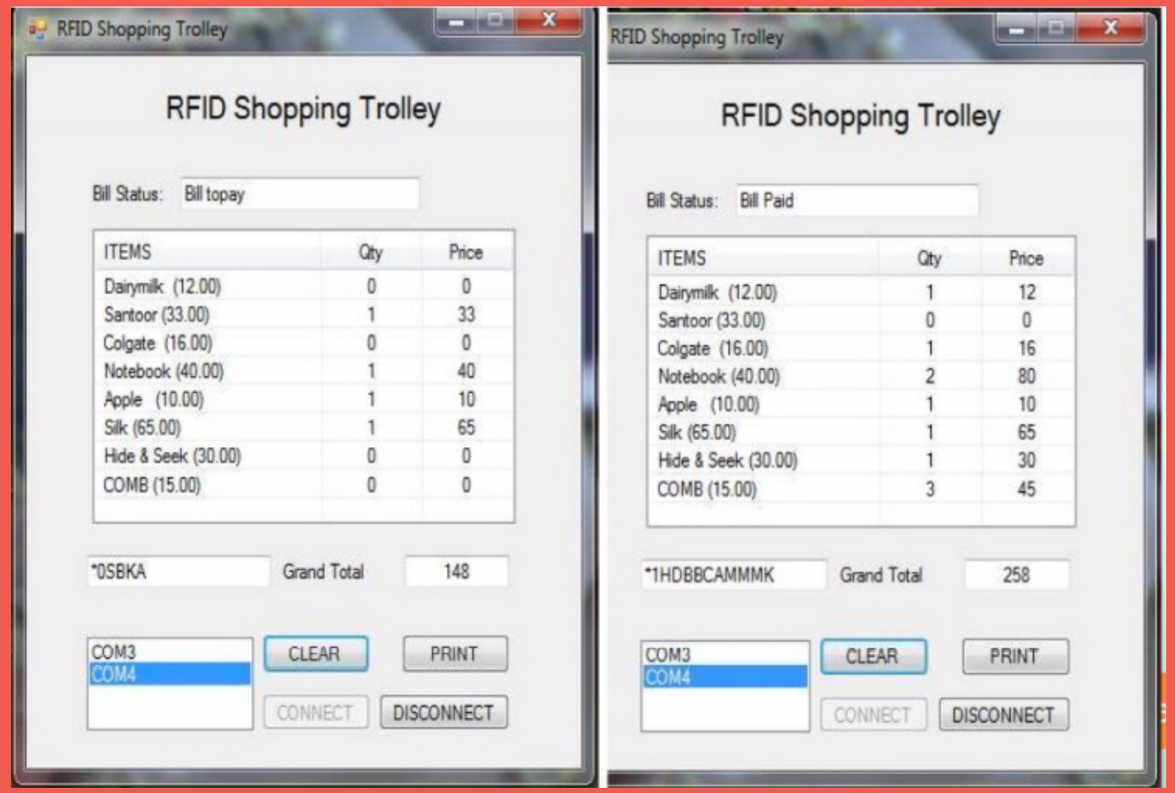


ADVANTAGES

1. Time saving-Avoids long queues for payment
2 Automatic billing
3. Mobile self-checkout system
4. User interactive system
5.Ensures security
6 Support card payment

Experimental Result





CONCLUSION

Whenever a product is added into the cart, it reads the product and stores the data. After completion of adding items the customer chooses their payment option and therefore the bill status is updated at the server of that particular cart. Customers can pay their bill through RFID ATM card or through cash or credit/debit cards at the billing section as automatically bill is generated.

Hence, by using RFID based smart shopping cart and billing system the shopping can be made easy for the customers as well as for the managing staff as it does not need any special training.

FUTURE SCOPE

1. Development of project can be done in many ways, where RFID tags can be replaced by RFID stickers which are small in size, low cost.

2. Security can be improved by counting the number of items or placing weight sensors within the cart for tallying the weight and getting all the types of product names when cart is passed through a particular aisle using camera module.

3. Multiple RFID tags can be read using a single RFID reader for more number of products which are added in the cart.

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