Smart Shopping Trolley

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***Abstract*—This project idea of "Smart Shopping Trolley" for the automatic billing in supermarkets. The project consists of RFID readers, Liquid Crystal Display (LCD), push buttons, crystal oscillator, 9V battery for power supply.**

When the user puts the product in the trolley, then its code will be detected using the RFID reader and name and cost of the product will be displayed on LCD and added to the list. And in case, the user wants to remove anything from the trolley, he will again scan the same RFID tag which will again be detected using RFID reader and the amount of that product will be decremented from the list.

Keywords—RFID tags, RFID readers shopping cart, time saving, LCD

I. INTRODUCTION

Radio Frequency Identification (RFID) refers to a system which has two components: tags and readers. The reader has one or more antennas which emits radio waves and receive signals back from the RFID tags. RFID tags can store a various range of information that is from one serial number to several pages of data. Each item is attached with RFID tag and it is detected using RFID reader and it is attached to a trolley.User purchases different commodities and puts them into trolley,the name and price of which is displayed on LCD screen which is attached with the circuit on the trolley. If one wants to remove some items , he/she have to remove it from the trolley,the RFID reader will again detect the same tag and delete it from the total bill.

II. LITERATURE SURVEY

1. Automatic Billing Trolley using RFID and ZigBee with Android Application Rewarding System.- International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering (An ISO 3297: 2007 Certified Organization) Vol. 5, Issue 5, May 2016
This model the system consists RFID reader and the products in the malls equipped with RFID tags.

2. Automated Shopping Trolley for Super Market Billing System.-International Journal of Computer Applications (0975 – 8887)
This system integrates a raspberry pie embedded chip with two barcode scanners and a battery kit to allow users to self check out at supermarket.

3. A model automation of shopping cart to ease queue in mall by using RFID module- SADHANA CHAUDHARI, 2NIKITA MAGAR, 3MAYURI PATIL, 4 SHALINI UBALE, 5PROF.A.R.GAIDHANI
ISSN: 2455-2631 © December 2019 IJSDR | Volume 4, Issue 12.
In this system we are using RFID tags instead of bar codes, whenever a customer puts a product into a trolley, it will get scan by RFID reader and product price and it will be displayed on the LCD. We are using zigbee transmitter which is used to transfer the data to the main pc.

4. Design and Implementation of Smart Basket Cart Using Near Field Communication - Indian Journal of Emerging Electronics in Computer Communications Vol.5, Issue 1 (2018): Page.778-785 ISSN: 2393-8366
In this technology, the communication is in between RFID tag and reader, each tag has magnetic strip with specific code and tag is read by RFID Reader module. The automated billing system based on the passive RFID provides suitable solution to the manual billing method in shopping mall.

5. A model of electronic shopping cart for effective shopping based on RFID. Authors: Kalyani Dawkar, Shraddha Dhomae, Samruddhi Mahabaleshwarkar.

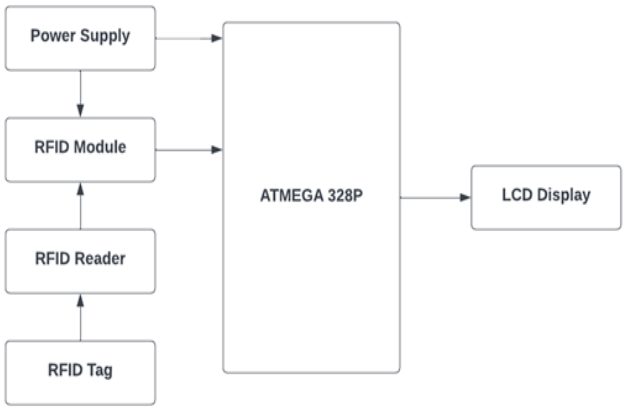
This system consist of smart trolley which will have RFID reader, lcd display. When the person puts a product in trolley it will scan and the cost, name and expiry date of the product will be displayed.

III. PROPOSED SYSTEM

The project consists of RFID readers, Liquid Crystal Display (LCD), push buttons,crystal oscillator, 9V battery for power supply.

When the user puts the product in the trolley, then its code will be detected using the RFID reader and name and cost of the product will be displayed on LCD and added to the list. And in case, the user wants to remove anything from the trolley, he will again scan the same RFID tag which will again be detected using RFID reader and the amount of that product will be decremented from the list.

A. Block Diagram of the proposed system and explaination



Components of the block diagram-

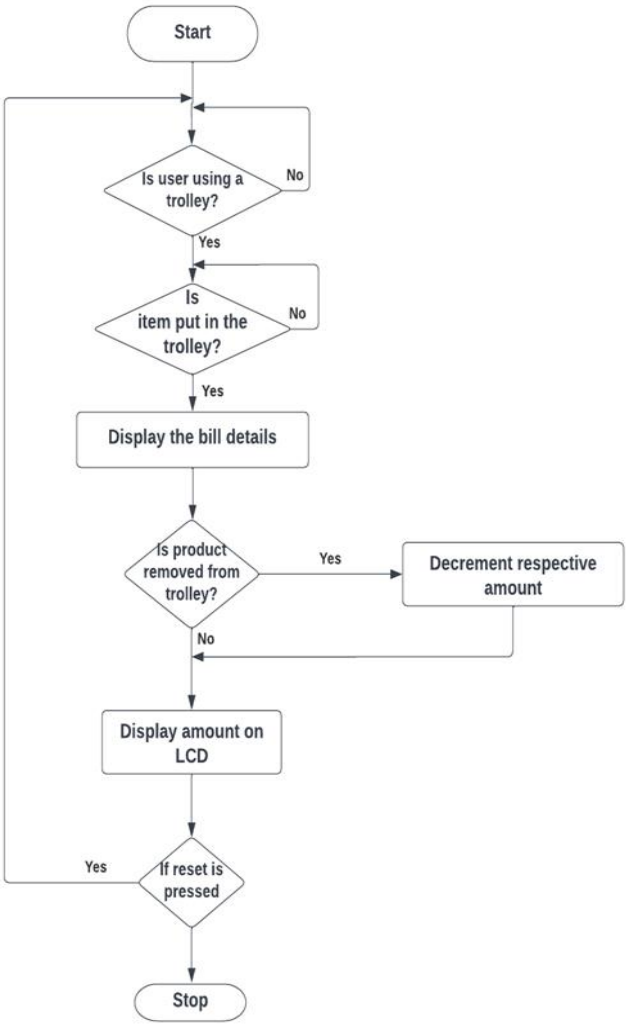
Power Supply –For power supply a 9V battey is used.It is used to provide electricsl supply to the circuit.
RFID Reader Module - A radio frequency identification reader (RFID reader) is a device used to gather information from an RFID tag, which is used to track individual objects. Radio waves are used to transfer data from the tag to a reader.Here EM-18 reader module is used. It can read multiple RFID tags at a time.
RFID tags- The tag information is stored in a non-volatile memory. Each product is attached with a RFID tag. The tag will provide information about the product such as its name, cost ,etc.
ATmega 328PU- It is the main IC in the project. is a high performance yet low power consumption 8-bit AVR microcontroller. It has advanced RISC architecture.

LCD Display- A liquid-crystal display (LCD) is a flat-panel display or other electronically modulated optical device that uses the light-modulating properties of liquid crystals combined with polarizers. The LCD will display the bill. The display is connected to I/O port of microcontroller.

The power supply of 9V is given to the system.The codes for the respective products such as milk, biscuits,etc are stored in their respective RFID tags.

When the user puts the product in the trolley, then its code will be detected using the RFID reader and name and cost of the product will be displayed on LCD and added to the list. And in case, the user wants to remove anything from the trolley, he will again scan the same RFID tag which will again be detected using RFID reader and the amount of that product will be decremented from the list and the total cost of the remaining products will be displayed on the LCD.

B. Flowchart



IV. TECHNICAL SPECIFICATIONS OF PRODUCT

A. Different Softwares used

The various softwares used are

- Proteus 8.0
- Altium designer – For PCB designing
- Arduino IDE.

B. Hardware used-

- .RFID Tag-Each product is attached with this RFID tag.

- EM 18-RFID READER Module-

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- LM7805 – Voltage Regulator IC

- LCD Display-

- Atmega 328pu microcontroller-

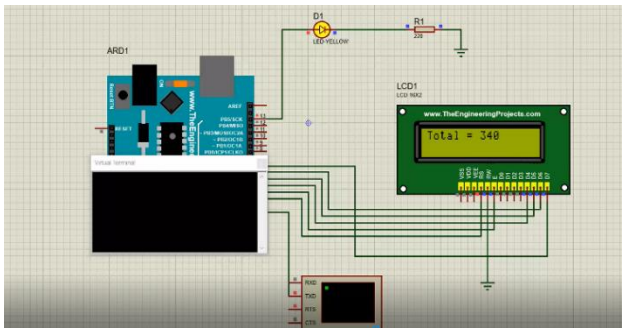
- Power supply- It's the main IC of the project.
- Shopping Cart- Shopping Basket

V. RESULTS

The above project is implemented first with the help of simulation softwares virtually and then it is implemented with the help of hardwares.

A. Simulation results.

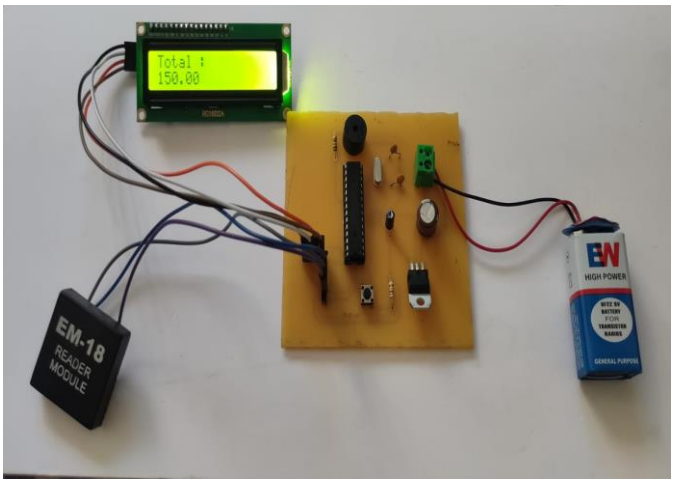
It is implemented with the help of softwares- Proteus 8.0 and Arduino IDE.



The total cost of products has been displayed in the above figure.

B. Hardware Implentation result

The below PCB circuit will be attached to the shopping trolley and whenever the user puts the product in the trolley, then its code will be detected using the RFID reader and name and cost of the product will be displayed on LCD and added to the list. And in case, the user wants to remove anything from the trolley, he will again scan the same RFID tag which will again be detected using RFID reader and the amount of that product will be decremented from the list



FUTURE SCOPE

Some advancements can be made in the above system such as we can use QR scanners, barcode scanners and Arduino also can be used. We can also provide online payment facility along with the bill generation.

CONCLUSION

As we know time is the money so this system is introduced to reduce the lot of time spent on the billing counters as well as this system will help customers to quickly check the price of the product and know the total amount.

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7. Indian Journal of Emerging Electronics in Computer Communications Vol.5, Issue 1 (2018): Page.778-785 ISSN: 2393-8366 “Design and Implementation of Smart Basket Cart Using Near Field Communication”.