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Auto Billing Shopping Cart

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Abstract: *The most valuable thing in today's world is time, people are referring those things which consumes less time. Billing in Shopping mall takes lot of time. Billing of products from mall is quite difficult because it takes more time as people have to wait for a long time in a queue for billing .Looking at the advancement in technology, we came up with an innovative idea of "Smart Shopping Cart for Automatic Billing in Supermarket". This project consists of RFID reader, motion detector sensor, Liquid Crystal Display, push buttons, switches . If user wants to use smart trolley functions then start button should be pressed. When a user put some product in trolley then its code will be detected using RFID reader and cost of a product added to the list and sensor will sense the direction of motion of the product for fault detection and buzzer will be on if fault detected. In case, if user wants to remove some product then user should press the remove switch and product code will be detected by RFID reader and again for any false activity buzzer will be on. At last, counter with least number of queues will be detected and displayed on the cart LCD.*

Keywords: RFID Tags, RFID Reader, smart shopping cart.

I. INTRODUCTION

The modern age of technology in which most of the customer needs to wait in the supermarket for shopping because it is a highly time-consuming process. A huge crowd in the supermarket at the time of discount offers or weekends makes trouble to wait in long queues because of a barcode-based billing process. In this regard, the Internet of Things (IoT) based Smart Shopping Cart is proposed which consists of Radio Frequency Identification (RFID) reader, Node MCU, LCD 16X2, IR Sensor, LEDs and Buzzer. RFID reader will be attached to the cart itself. Whenever an item is purchased and put in the cart, the customer will have to show it to the RFID reader which will automatically read the tag value of the item and will display its name with price and quantity on the LCD. This reduces human efforts to stand in the queue for a long time at shopping mall.

II. MOTIVATION

A supermarket or a hypermarket is a form where wide variety of product items is available. These product items can be food, beverages or any household product. The main purpose of supermarkets is to provide availability of all the products and save the time of the customers but sometimes customer gets frustrated while waiting in the queue at billing counter and sometimes they get confused while comparing the total price of all the products with the budget in the pocket before billing. To overcome these problems, we have designed a smart trolley using a smart phone.

With this system, there is no need for customer to wait in the queue for the scanning for the product items for billing purpose. Supermarkets or Hypermarkets provide this faculty to only those customers which having membership cards. When the customer inserts the membership card in the basket or trolley only then it will work as a smart trolley. Otherwise, it will work as a normal trolley. Supermarkets and hypermarkets use this technique as a strategy to increase the number of customers.

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III. BLOCK DIAGRAM

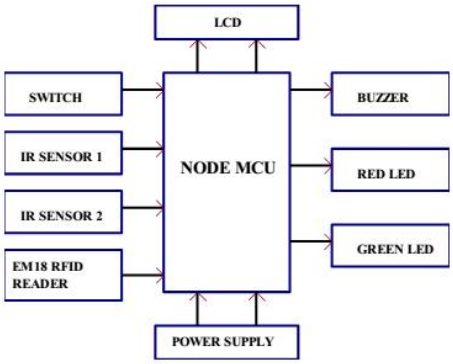

Figure 3.1: System Architecture

3.1 Block Diagram Explanation

The proposed system uses RFID reader using which each and every purchased item will be counted and we will get sum of all the products which will be displayed on LCD. Node MCU microcontroller will be used for interfacing LCD and RFID reader. Node MCU will continuously monitor the scanned items in the shopping trolley and also will sum up all the items with their name and quantity as well. This will reduce human efforts and time for billing at shopping malls. Along with this, if any extra item is added in the trolley without scanning, Buzzer will get ON which will give Theft indication. Thus, maintains security. For this, Two IR sensors will be connected to the trolley. IR sensors will continuously monitors the items to be placed in the trolley and give command to the Node MCU for counting the ratio with RFID count. If RFID count is less than cart count, the Buzzer will get ON, else it will be OFF.

IV. CIRCUIT DIAGRAM

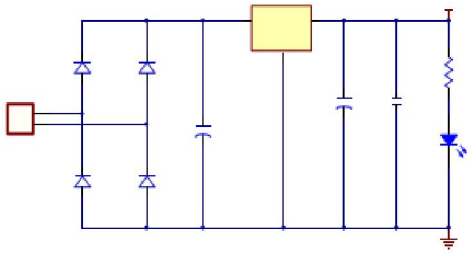

Figure 4.1: Power Supply Design

4.1 Main Circuit

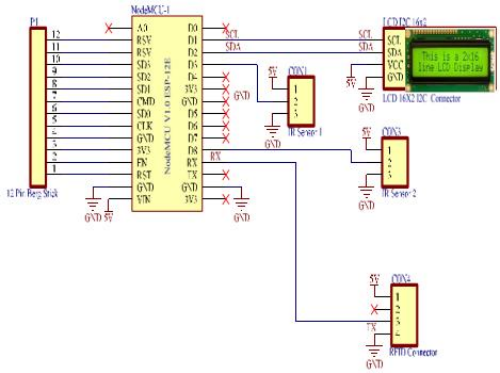

Figure 4.2: Main Circuit Diagram

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4.2 Simulation Of Power Supply

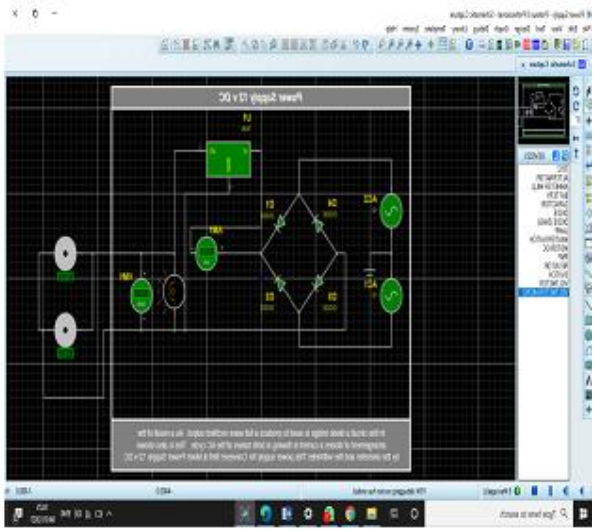

Figure 4.3: Power Supply Simulation

4.3 Simulation Result

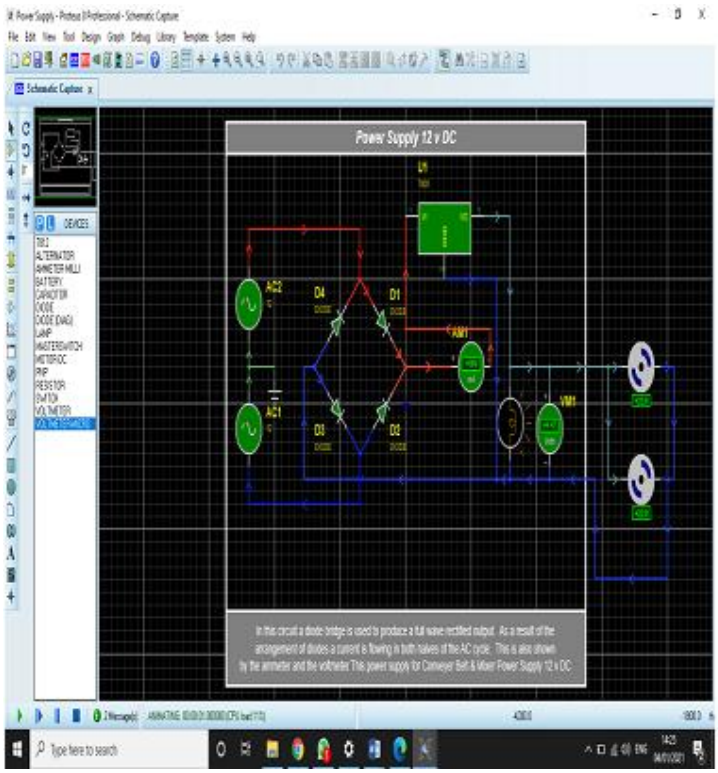

Figure 4.4: Power Supply Simulation Result

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V. ADVANTAGES

1. To save the time of people for barcode scanning of each product at the counter.
2. Reducing manpower.
3. User-friendly
4. Fully automatic system.

VI. APPLICATIONS

1. Shopping Malls
2. Industry
3. Grocery stores

VII. CONCLUSION

In this paper, a smart shopping system uses RFID technology recover from experiences and security issues. The smart carts can read and retrieve information of the products inside the trolley, and data will get displayed on LCD.

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