

SMART SHOPPING TROLLEY WITH BILLING SYSTEM USING IOT AND BLYNK APP

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Abstract : A Smart Trolley is mandatory tool for shopping in supermarkets or grocery stores. We've been pushing the shopping trolley since 1937, cities expanded people multiplied but the trolley still unchanged. In this busy world waiting in long queue during shopping it is extremely irritating and this consumes lots of time of customers in the malls and shops. Introducing the smart shopping Trolley using Nodemcu, LCD, RFID reader, LCD & motor driver. The smart Trolley is self-service payment terminal just shop, pay and pass the queues. RFID reader reads the product information and sends to webserver created using Nodemcu. The trolley is controlled by joystick created using Blynk app over Wi-Fi. Nodemcu read the signals and send commands to driver circuit to drive the motor in forward, left, right and reverse direction.

IndexTerms - RFID reader, NodeMCU, Motor Driver, LCD, Trolley, Webserver.

I. INTRODUCTION

A shopping trolley is an important for shopping in stores, supermarket or malls. The different products are purchased in a shopping mall, markets, shops etc. with the help of shopping trolley. It is irritating and time-wasting for customer. To avoid this problem, we are introducing a futuristic shopping system. This system will replace normal and time-wasting system. In this Billing system we are using trending technology like Internet of Things along with Android app and RFID. The system allows a customer to scan the items and the trolley automatically updates the total cost and bills the customer on webserver as well as LCD display. IoT is a trending technology in today's world and it helps us in performing different tasks by making them easier and efficient. The IoT and robotics communities are coming together to create the Internet of Robotic Things. In the IOT controlled Trolley joystick is created using the Blynk app for controlling the trolley in different directions using Nodemcu and motor driver. Blynk is an open-source platform based on iOS and Android that lets you talk to Nodemcu over the Internet. A recent literature review [1] Presents a RFID based system, the product details are displayed on the screen which attached to the trolley as the product placed in the trolley after shopping done customers pays the total bill shown on the screen. There is no need to carry the trolley at the counter side. This system reduces the physical task of customer load.

The second paper [2] deals about Smart Electronic shopping Trolley which reduces time while purchasing the products at shopping malls. Nowadays shopping at malls is becoming daily activity and there is number of peoples visits at stores on holidays. The Barcode scanner is attached to the trolley it identifies the product and update the bill on the shop server and display the number of items and total amount on LCD.

The third paper [3], the authors developed a model which made use of RFID tags fixed on the products as well as ZigBee to transmit bills to a server. As the customer add each product in the trolley it gets detected. The of all these products along with total bill displayed on the LCD screen as well as the server via ZIGBEE.

The long queues and time spent at for billing at counter is a huge waste of time. This paper [4] talks about how to control robot using Wi-Fi module through android application. This robot is also be used for push the object from one place to another place.

The trolley of the present time has to be pushed in order to relocate it. One of the most annoying things for customer is trolley with wheels that won't go in the same direction. It will be more difficult if a person has to buy a lot of items making the trolley much heavier to push. This paper [5] represents about the IOT based robot using Nodemcu and Arduino. It can be controlled manually as well as automated mode with help of laptop or mobile through Internet of Things (IOT).

II. BLOCK DIAGRAM:

Fig. a & b shows the block diagram of project. This project is mainly divided into two parts:

- a. Billing system using IoT
- b. IOT controlled trolley using Blynk App

Billing System Using IOT:

This consists of RFID Reader, NodeMCU, Data server, LCD display, Buzzer, Power supply. RFID Reader reads the data of product and then the data is sent to the NodeMCU and display the details on webserver and LCD display.

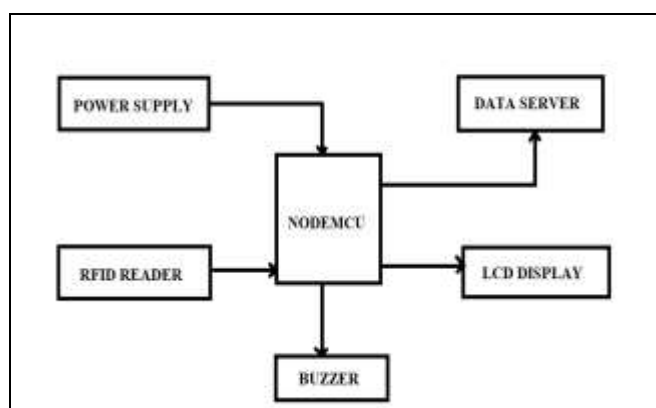


Fig. a

IOT controlled Trolley Using Blynk App:

This section consists of NodeMCU, Motor Driver (L298N), 18650 Lion Battery(11V), Blynk App, Four Motors, 5V Supply. Joystick created using Blynk app which control the motion of trolley and sends the command to motor driver to drive the motor in particular direction.

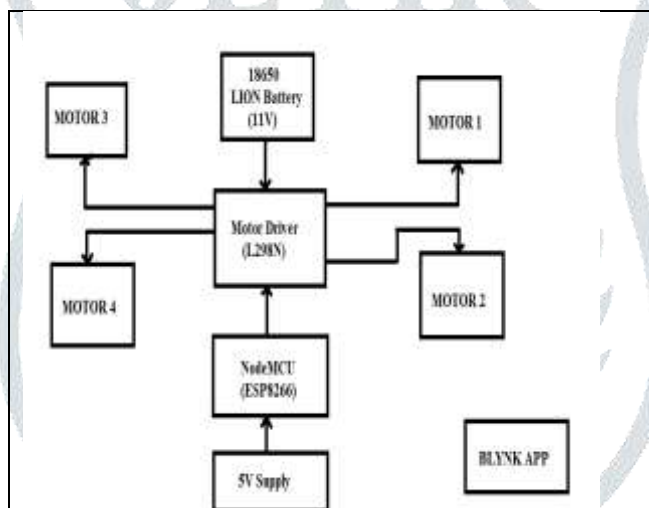


Fig. b

III. WORKING PRINCIPLE

EM18 Reader is very popular RFID module. Each RFID card is linked with product digital data is encoded in RFID cards and decoded by an RFID reader module using radio waves. RFID reader continuously sending radio waves when RFID tag(passive) comes in range of reader, it will send feedback signal which is having product information like name and price of product and send all data to NodeMCU. Then Nodemcu display the available items in the Trolley and total amount in the Trolley and sends them to webserver created using Nodemcu and 16*2 LCD display.

In the IOT controlled trolley joystick is created using Blynk android application to control the trolley in required directions. So Blynk android application is used as a transmitting device and wi-fi module is used as a receiver. Blynk is an open-source Platform which is supportive to both IOS and Android for designing IOT based application to control IOT based hardware. The smart trolley is operating with Nodemcu and the order is given by the Blynk android application in a mobile phone using the wi-fi network. They produce two pieces of data: position components along x- and y-axes. Using that data, a project can compute an angle between 0 and 360° and use it to drive another mobile mechanism. The joystick controls the trolley in forward, left, right and reverse direction and slider is used to for adjusting the speed of trolley.

IV. RESULTS

In the result when the RFID card is scanned the product details and total bill will be shown on the LCD display as well as Webserver as shown in fig 1 and 2 below. The product can be removed by pressing pushbutton. Customer pay their bill online and go. There is no need to push the trolley for controlling the trolley joystick created as shown fig 3 below can be moved in any direction using blynk app.



Fig 1: Billing System

ITEMS	QUANTITY	COST (Rs.)
Biscuit	2	70
Soap	2	76
Green Tea	1	55
N95 Mask	1	45
Grand Total	6	246.00

Pay Now

Fig. 2: Webserver

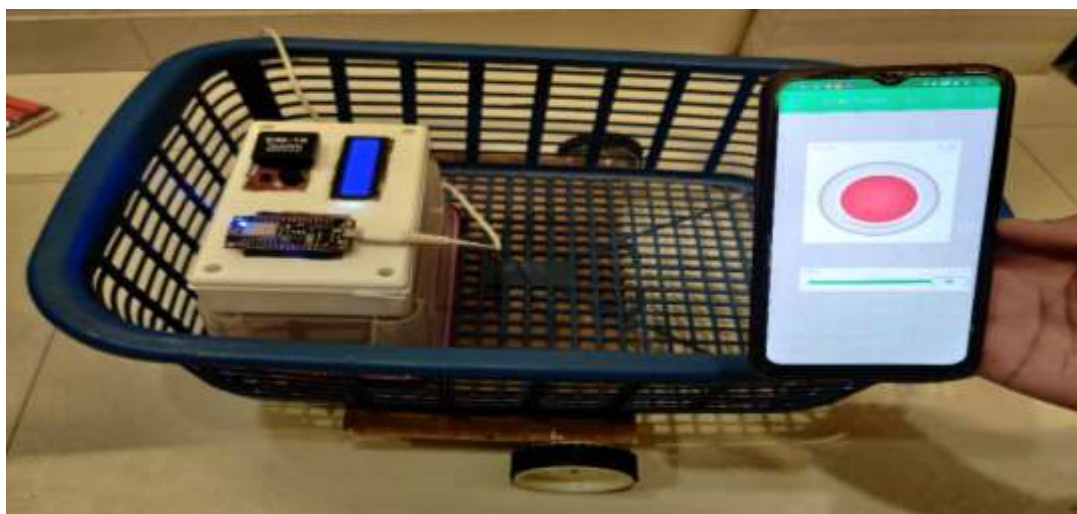


Fig.3: IOT controlled trolley using Blynk app

V. FUTURE SCOPE

In Future work we can add swipe card machine at the trolley. Thus, there is no need of queue so time of customers reduced. We can add Indoor map of market to easily search the products location in market. Another feature can be added is instead of controlling trolley manually we can make the trolley autonomous using GPS and Bluetooth so trolley follow the customer by connecting customers smartphones via Bluetooth.

VI. CONCLUSIONS

The smart Shopping Trolley create automatic billing system for malls and supermarket. Using this system, the customers no need to stand in front of counter for payment as well as no need to push the trolley. The customer pays their bills online. Hence by using Smart shopping the shopping can be made easy for the customers. More customers can be served in same time thus benefiting the retailers and customer as well.

VII. REFERENCES

- 1) Haritha. K. Sivaraman, "Automated Smart Trolley for Supermarkets", International Journal of Engineering Research & Technology (IJERT), Volume No.06, pp (1),2018.
- 2) Sarala T, Sudha Y A, Sindhu K V, "SMART ELECTRONIC TROLLEY FOR SHOPPING MALL", 2018 3rd IEEE International Conference on Recent Trends in Electronics, Information & Communication Technology (RTEICT-2018), MAY 18th & 19th 2018,pp(2422)
- 3) M. Vanitha Sheba and Brintha Rajakumari, "RFID Enabled Smart Billing System", Indian Journal of Science and Technology, Vol 8(32), DOI: 10.17485/ijst/2015/v8i32/87761, November 2015, pp (01)
- 4) S R Madkar (Assistant Professor), Vipul Mehta, Nitin Bhuwania, Maitri Parida, "Robot Controlled Car Using Wi-Fi Module", International Journal of Advanced Research in Computer Science and Software Engineering, Volume 6, Issue 5, May 2016,pp(460)
- 5) G. Anandravisekar, A. Anto Clinton, T. Mukesh Raj, L. Naveen, "IOT Based Surveillance Robot", International Journal of Engineering Research & Technology (IJERT), Vol. 7 Issue 03, March-2018, pp(84)

