SMART SHOPPING TROLLEY USING RASPBERRY PI

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ABSTRACT

Supermarkets are where people come to buy a wide variety of items for domestic and commercial purposes. In metropolitan cities, we can see a huge rush at supermarkets, on holidays and weekends. This becomes more when there are huge offers and discounts. In supermarkets, people purchase a variety of items and put them in the trolley. After purchasing one should approach the billing counter for billing purposes. With the help of a barcode reader, the cashier prepares the bill and this is a time-consuming process. This results in long queues at billing counters. This paper presents an idea to develop a system in supermarkets to overcome the above problem. To achieve this all products in the market should be equipped with a RFID tags and all the trolleys should be equipped with RFID reader and QR codes. When one wishes to buy any product, they need to scan the tag attached to the product and drop the product into the trolley. The item name, cost including the quantity will be displayed on their mobile phone. If the customer wishes to remove the product from the trolley, they can decrement the quantity and the amount of that specific product gets deducted from the total amount. Hence the billing can be done in the trolling itself thereby saving a lot of time for the customers.

Key Words: Barcode Reader, RFID Reader, RFID Tags, QR Codes.

INTRODUCTION

One important task that humans invest maximum measure of energy is in shopping. Shopping centre is a spot where individuals get their everyday necessities running from sustenance items, garments, cosmetics, electrical machines and etc. In this modern world, each grocery store and super markets utilize shopping trolleys with a specific end goal to help clients to choose and store the items which they expect to buy. Customers usually purchase the required products and place them in their carts and thereafter wait at the billing counters for payments of bills (Figure 1). The payment of bills at the counters is really troublesome and time consuming which thereby increasing a heavy crowd at the billing counters (1).

Motivation: The fundamental motivation behind this system is to show the proposition of design and

arrangement of an inventive framework for obtaining of items in the markets. With this shopping cart a wonderful opportunity will be developed which assists the customers by showing the catalog of products and their respective costs. This smart cart has the capability to make shopping more fun, relax able, comfortable and systematic for the customers as well as making easier for the store management (2).

Hardware and software requirements: The hardware components required are: Raspberry Pi3, RFID reader, RFID tags and QR codes.

Raspberry Pi3: We are using a third generation Raspberry Pi. This is a strongly built credit card sized single board computer which can be used for various implementations. The Raspberry Pi3 possess wireless LAN and Bluetooth connectivity. This operates with 5.1V micro USB supply. The maximum power supply RaspberryPi can use is 2.5Amp (3).

RFID reader: Radio Frequency Identification is the wireless non-contact use of radio frequency waves that is used to transfer data. An RFID reader is called as the brain of the RFID system and it is important for any system to function. RFID readers use radio waves in order to communicate with RFID tags.

RFID tags: Radio Frequency Identification (RFID) tags are small devices that utilize low- power radio waves to receive, store and transmit data to nearby readers. RFID tags are affixed to items in order to them using an RFID reader and antenna (4).

QR codes: QR code means Quick response code is a kind of matrix barcode often contains data for a locator, identifier that points to a website or application.

Software Requirements: Python is used as a programming language in Raspberry Pi. HTML is used for the creation of web page so as to display the purchased product details.

FLOW CHART FOR CODE

The detailed functioning of Automation of shopping cart is as follows:

- Firstly, the customer needs to scan the first QR code with their mobile phone, attached to the cart which connects the mobile to raspberry pi's hotspot.

- They then need to scan the second QR code which redirects them to a web page.

- The webpage displays the purchased product details.

- If the customer wishes to purchase a product, they need to scan the RFID tag of the product with the help of RFID reader.

- An item will be added to the bill and the total cost including the quantity will be displayed on the mobile screen.

- If they wish to remove any product from the cart, they need to decrement the quantity in the web page and then remove it from the cart.

- Finally, after all the shopping customer pays the total amount displayed on their mobile phone and checks out.

CONCLUSION

With this application, shoppers no longer have to wait near counters for payment of bills. Different variables like cost, item name, quantity etc are continuously displayed on mobile. Thus, we can say automatic billing of products using RFID technique will be more feasible choice in upcoming days. In near future instead of customer dragging the shopping cart, the cart could be "driverless" i.e., it could follow the customer around the mall by avoiding all the obstacles.

Fig –1: People waiting at the billing counters in super markets.

Fig -2: Raspberry Pi3.

Fig- 3: RFID reader.
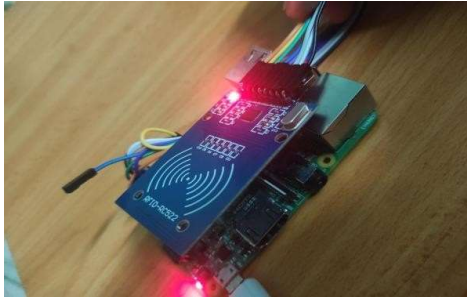

Fig -4: RFID tag.
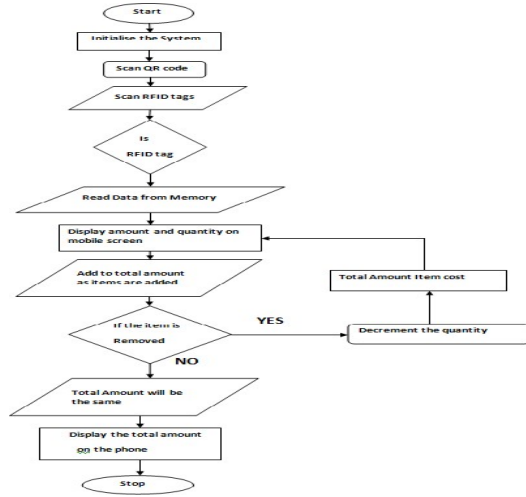
Fig -5: QR code.

Fig -7(a): Hardware setup.
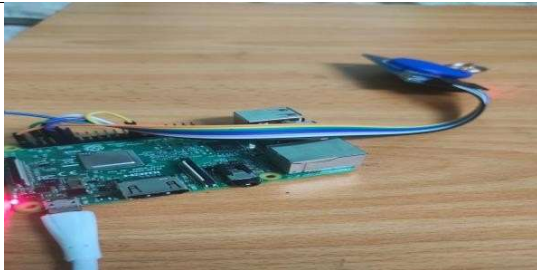

Fig- 6: Flow chart for the code.

Fig -7(b): Hardware setup.

Fig -8: The bill displayed on the webpage after shopping.

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