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Implementation Of IOT Based Smart Billing Trolley

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Abstract - This system gives solution to reduce the shopping time at supermarkets. Every supermarket employs shopping trolley in order to aid customers to select the products which they intend to purchase. At billing counter customer may face many problems like waiting and don't know even they have sufficient money for the products they purchase. The billing process at the counter is a time consuming and also need more human resource in the billing section. To tackle this problem, we have proposed a solution in which a smart shopping cart is used to overcome these problems. It has barcode scanner and LCD display, which can be used scan the product and display the product information, cost and total bill. The customer can pay the bill through any one of the online payment options such as GPay etc. This solution will increase the customer experiences and reduce the shopping time.

***Key Words*:** GSM Module, Node MCU, LCD Display, Barcode Scanner

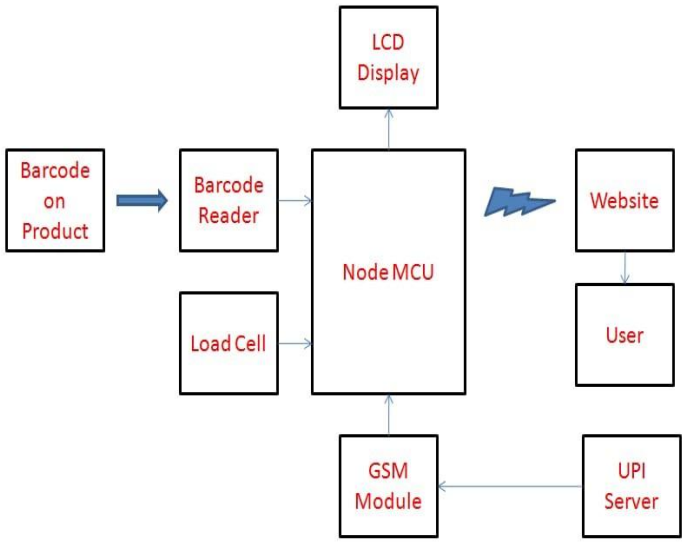
1.INTRODUCTION

Shopping malls are the attractions for the people now a days. Whether it is the shopping of luxurious things or the products of daily use people prefers the shopping malls and supermarkets. Having all required things at one place makes the shopping easy. Due to growing population in cities shopping places are getting crowded, we can find a lot of rush, especially on the weekends. As a result of this customers have to wait in long queue for billing. The manpower at the billing counter is insufficient at times. This leads to a lot of chaos and bad feedback from customers. Trolleys are provided in every shopping market. Here, a device will be placed on the trolley, the customer will have to pick up the product he/she wants to buy, scan the barcode of the product using the device's camera and the bill will be displayed on the screen. Bill will consist of information like serial number, name of the product, quantity, and price. With every purchase the same procedure will be followed and the bill will be updated accordingly, customer can see updated total of bill throughout the purchase. Customer has to give the trolley number displayed on the screen to cashier and bill will be displayed on cashier's display, as the bill is ready, the customer simply needs to pay and checkout.

2.PROBLEM STATEMENT

The problem faced by the customer is that they need to wait at the billing counter until the employee of the mart scan each and every product purchased by the customer to generate the filling billing this results other customer to follow the tedious queue One common problem faced by the customer is BUDGETLIMIT. usually before we start to shop we have a fixed budget limit but while shopping we do not make record of the product price such that we keep on adding the products to our cart later when we go for the billing counter we realize that our budget have been exceeded. And while shopping it is difficult for the customers to search for product in such a huge mall.

3.METHODOLOGY

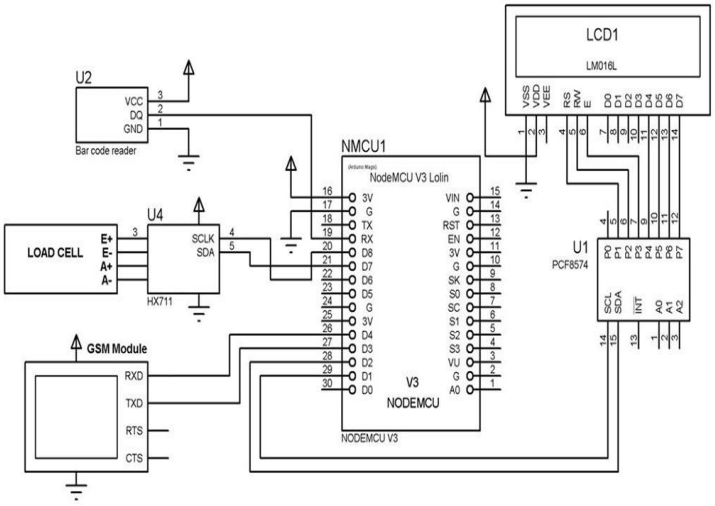


An IOT-based smart billing trolley is a technology-driven solution designed to enhance the shopping experience by providing automated billing and inventory tracking. The methodology for developing such a system involves several key components, including hardware selection, software development, and system integration.
Whenever a customer chooses a product to buy, the customer himself has to scan the product using a barcode. Those barcode contain the prizes of the particular product. As soon as the customer scans the product the buzzer will ring up. After scanning the particular product's barcode, the total prize will be shown on the LCD screen. After completing the shopping, the customer has to scan the final tag. After scanning the final tag and the final bill prize will be sent. The online UPI links through which customers can conveniently and securely pay.

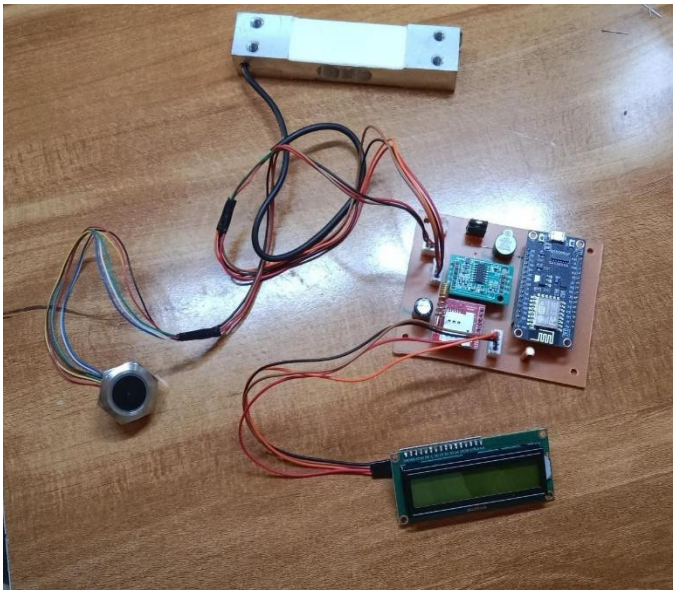
4.WORKING PRINCIPLE

When the trolley is turned on, it connects to the store's Wi-Fi network and initializes all sensors and peripherals. The customer scans the barcode of each product using the scanner attached to the trolley. The Arduino Nano receives the barcode and fetches the product details (name, price, and expected weight) from the server via the Wi-Fi module. The load cell measures the weight of the item placed in the trolley. The Arduino checks if the actual weight matches the expected weight from the database. If the weight doesn't match, an alert is triggered to notify the customer or store staff. The Arduino maintains a running total of all items scanned and updates it in real-time on an attached display. Once shopping is complete, the system generates a final bill. A QR code for the total bill is displayed on the trolley or sent via SMS using the GSM module. The customer scans the QR code using GPAY to complete the payment. Upon successful payment, the system sends a notification to the store server.

5.CIRCUIT DIAGRAM

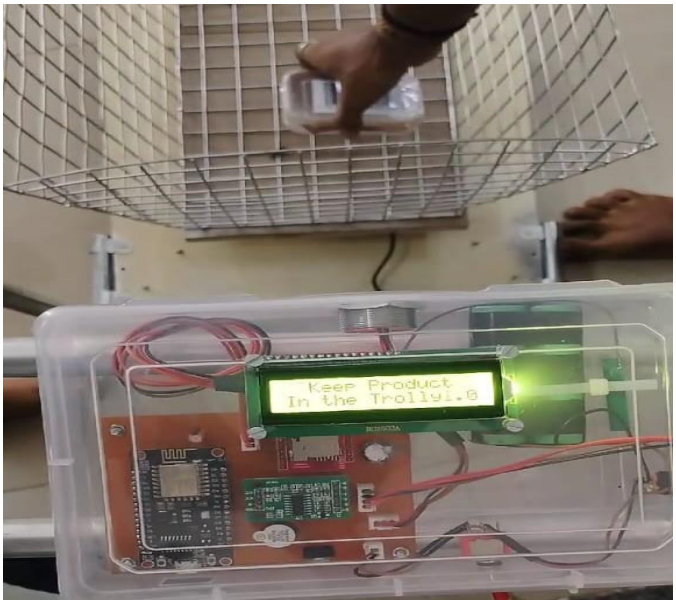


6.PCB MOUNTING

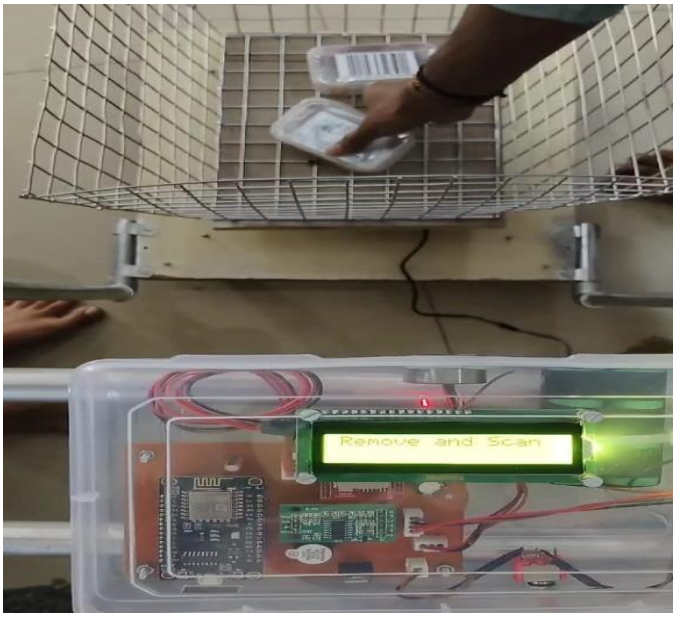


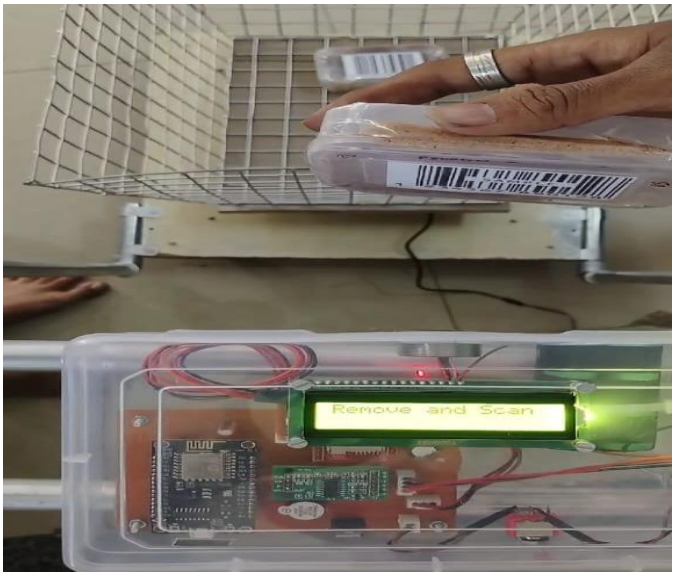
7.RESULT

1.When product is scanned then shows on the display.



2.Using the REMOVE scanner when the product taken is no longer wanted.





Product is removed.

Confirm all products and create a bill using CONFIRM scanner.

Final Project Model

8. CONCLUSIONS

The smart trolley system, integrating a barcode reader, load cell, IoT module, and Arduino, demonstrates an innovative solution to enhance the shopping experience. It automates tasks like product identification, weight measurement, and billing, making the process faster, more accurate, and user-friendly. By leveraging IoT technology, it enables real-time data transfer and remote monitoring, bridging the gap between customers and retail management systems. This implementation showcases a scalable and efficient framework that can be adopted in supermarkets and retail stores, ultimately reducing manual effort and errors.

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