

SMART CART BILLING SYSTEM USING IOT

No more overspending time, shop smart

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Abstract- In the present-day shopping system one of the difficulties is to follow a line through the billing process which is time consuming. Hence this design aims to reduce the average time spent by the client at the shopping boardwalk by enforcing an automatic billing system using Rfid technology. The main end of the design is to satisfy the client and to reduce the time spent on the billing process which is to complete the billing process in the trolley rather than staying in a line indeed for one or two products. The guests must add the products after a short checkup in the trolley and when the shopping is done, the perfected quantum will be displayed in the trolley. guests could either pay their bill by their pre-recharged client card handed by the shop. Eventually, the whole information will be transferred to the central PC of the shopping boardwalk. The smart wain should be suitable to directly read particulars put into or removed from the wain. An item put into one wain shouldn't be read by another wain hard. The garçon should maintain the state of particulars in the store. With RFID compendiums installed on the shelves, the particulars can be covered and the item stock can be streamlined to the garçon. We propose installing RFID compendiums before the exit door, which can overlook all the particulars in the smart wain, and check with the garçon if everything in the wain has been paid. If a dishonest client tries to leave the store without making a payment, he'll not pass the verification.

Keywords- RFID Technology, Smart Wain: - Cart, Garçon: - Main Servant.

I. INTRODUCTION

IoT has been a hot topic in recent years. The IoT has many applications; smart shopping carts are one of them. Several research papers on improving the customer shopping experience have been published in recent years. [1] For the Iot -based smart cart proposed in the article, the author created a model system that supports easy shopping. The model is attached to a Trolley for easy viewing. It consists of an RFID reader that scans each product with an RFID tag. Billing is done on the smart cart. The product name and price will be displayed on the lcd screen. [2] presents a smart basket. It consists of RFID and Arduino. The quantity and weight of the product will be displayed here, along with the price details. If there is an incompatibility with the database, the buzzer will beep. The smart billing system introduced in [3] consists of RFID, IR sensor, and ultrasonic sensor. The reader reads the tag in the product and transfers the corresponding amount to the billing meter. They can get a copy of the invoice after paying at the counter. The automatic billing system was developed in [4]. The author has innovated a system that supports smart billing carts. Because they represent systems with additional functions that will calculate and update customer accounts. Products and prices will be displayed on the LCD screen. They can go directly to the billing counter to pay the amount. Smart carts in shopping malls provide [5]. It has increased worldwide due to increased demand and government spending. The traditional invoicing system must be continuously improved to improve the quality of purchases. In order to improve the existing system, this shopping cart will use RFID readers to generate purchase invoices on the shopping cart. The system will save time for customers and workload for store staff. Smart carts use automatic invoicing in [6] product information, use RFID for product recommendation at the invoicing counter, the invoice displayed on the screen will be transferred to the system memory. This is possible with an RFID module that transmits the invoice wirelessly. The disadvantage of this system mode is that we have to enter the key once after displaying the total number of products and the price. Nothing was added afterwards. Or product withdrawal will occur. In this article, the RFID and billing system of senders and receivers in [7] shopping malls may experience a lot of peaks during holidays, weekends, especially during promotions and discounts. Due to mall shopping, customers nowadays prefer shopping online to get what they want, such as Amazon, Flipkart, Snapdeal, etc. get. To solve this problem, this article offers a virtual shopping cart to remove the complexity of online and offline shopping ensuring a better experience.

II. SYSTEM ARCHITECTURE



Fig 1: Smart cart billing system

As shown in fig 1, system consists of 8 components such as ESP8266, RFID Tag, RFID Reader, OLED, Buzzer, WIFI, Local Server.ESP8266 interfacing with RFID modules-RS232, OLED, buzzer, RFID card, WIFI and bill information sent to the local server.

After the WIFI module is powered with a 2850MAH 1C LI-ION rechargeable battery, it is initialized and configured to basic settings, now the system is ready to continue, which means that the RFID card and tag can be scanned. After that, the RFID card or tag is scanned, the RFID reader searches for all the information on the scanned card or tag, and if the scan is successful, the output information is transferred to the WIFI module memory and then to the Oled module to be displayed on the Oled screen. Here, the RFID module uses SPI communication technology to transmit or retrieve data from the RFID card or tag [4]. When you make purchases, all invoice information is displayed on the Oled screen, each card or label acts as a product, where the product information is preset or entered on the card. Once the shopping is done the bill is sent to the owner of the shop via the Esp8266 WIFI module. The entire work process is realized with the Arduino IDE software. wowki simulation software is used to verify simulation results before hardware implementation.

III. SYSTEM FLOWCHART

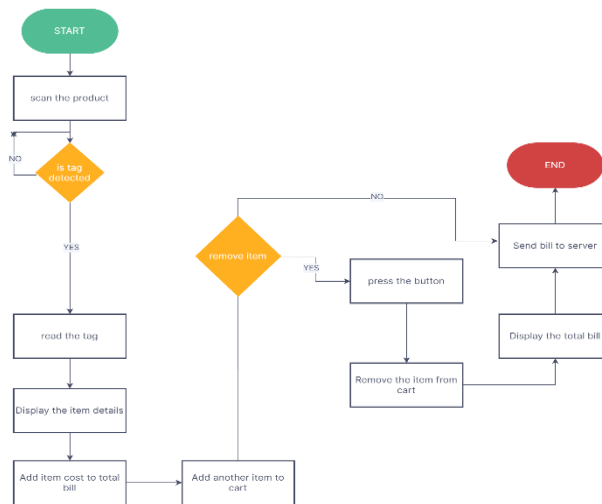


Fig 2: shows system flowchart

System functions as per the following algorithm.

- Step 1: Start
- Step 2: Scan the RFID tag
- Step 3: If tag detected, proceed else repeat the step 2.
- Step 4: Read the information from the tag and display the item details.
- Step 5: Display the total cost and proceed for another item.
- Step 6: To delete the item, press the button and remove the item from the cart.
- Step 7: Display the total bill.
- Step 8: Send the total bill to the server of the bill counter.
- Step 9: End

IV. RESULT

1.Simulation Results:

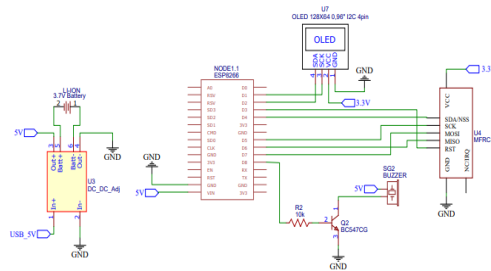


Fig 3: shows schematic diagram

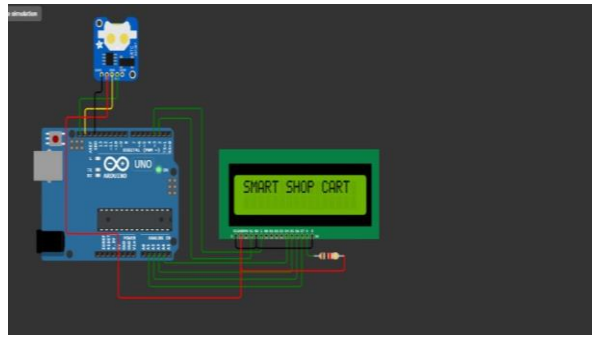


Fig 4: Simulation

In in fig 4, it is simply conceivable to show the total connecting and reenactment run for the LCD module. The simulation of the RFID and ESP8266 modules cannot be shown because these modules require manual input, such as RFID card scanning.

2. Hardware Results:

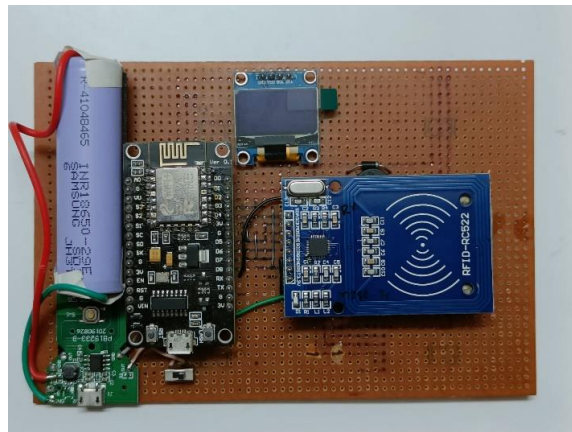


FIG 5: HARDWARE

Referring to fig 5, The hardware is powered up by 2850mah li-ion rechargeable battery. Once the system is powered up, the initial message displayed will be “Smart Shopping Cart.” The next message will be “Please add items to the cart.”

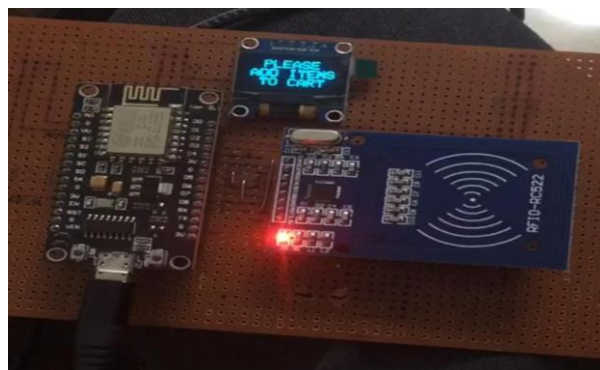


FIG 6: INITIAL MESSAGE DISPLAY

As per fig 6, After the initial message is displayed the system is ready to scan the products when the Rfid tag is scanned all the details that are present in the tag is received by the Rfid receiver. The product name and cost are displayed on the Oled display, which shown in fig 7.

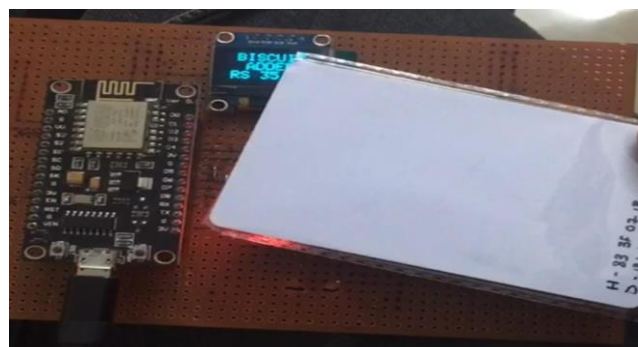


Fig 7: Product details displayed after scanning.

Smart Shopping Cart

ITEMS	QUANTITY	COST
KETCHUP	1	35
CAKE	1	38
Rice(1KG)	1	55
JAM(50g)	1	45
Grand Total	4	173.00

Pay Now

FIG 8: DISPLAY ON LOCAL SERVER

After the purchases are done the shop owner can see the details about the purchase on the local server via Esp8266 WIFI module.

V. CONCLUSION

In conclusion, the system described—which consists of an ESP8266 coupled to numerous parts—offers encouraging future potential for development. Advanced inventory management, tailored customer experiences, smart home integration, real-time analytics, online payment gateways, voice control, and integration with third-party APIs are a few of these. By looking into these options, the system may develop into a complex solution that boosts operational effectiveness, enhances user experience, and adjusts to shifting technological trends and user expectations.

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