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AUTOMATED SHOPPING TROLLEY FOR BILLING SYSTEM

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ABSTRACT

In today's world intelligence and information aims at digitalizing and implementing efficient, and user friendly systems to easier human life. Designing a smart trolley that takes care of quick billing is a leap towards a completely automated shopping experience. The system is mainly concerned to reduce time spent on shopping and making the billing process easier. Further, it permits the customer to deploy their time on other proceedings. The system will also bring upon anti-theft control where the customer will not be able to take non-billed item.

KEYWORDS

Barcode Scanner, LCD Display, Raspberry pi, Smart Cart, Trolley

1. INTRODUCTION

The important goal of modernism is invention which uplifts lifestyle of human being more frequently. Time has become money. So, people actually do not have much time to spend for shopping which is an inescapable thing. Thus, people prefer shopping in malls so that they can get all the products at the same location. According to survey, the human can spend approximately 1 to 2 hours for shopping and most of the customers will always tend to walk away from queue if it is too long. The current scenario in shopping is categorized into two types: Shopping individually and shopping without physical presence. Shopping without physical presence is in various ways including, online shopping. Shopping individually incorporate an independent visit to the shopping mart and choosing products which is more needed, accommodation, label and offers. In the conservative shopping spaces, people want to bring around trolley. All the products in the trolley are then billed at the billing counter. So there is a long queue for depart and payments at the exit counter. The proposed "Smart Trolley" which will reduce the time of customers & will decrease the manpower at the Billing Section and increase efficiency.

2. RELATED WORK

"Automatic moving shopping trolley using sensors". With the use of these trolley customers can enjoy their shopping and pay more attention on their shopping list without the need of pushing shopping trolley. The system of billing will be placed in the trolley. It will consist of RFID Reader. When a person puts any product in a trolley its code will be detected using RFID Reader attached with the trolley. As the product is added to the cart the cost of the product will get added to the bill. Thus, bill will be generated in trolley itself and displayed on LCD.Preferring to develop a smart shopping cart system that will keep the

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track of buying goods and also online transaction for billing using RFID and ZigBee. The system will also give guidance for products to buy based on user past records from a centralized system. In this system, every item in Mart will have RFID tag,RFID Reader and ZigBee attached to it.Each and everyitem has RFID tag instead of barcode scanner. The shopping trolley will contain RFID reader, LCD display and ZigBee transmitter. When customer places any product in trolley it will scan the product and the cost and name of the product will be displayed on LCD.

3. PROPOSED METHOD

The aim of this project is to employ new technologies and to vanquish the difficulties during shopping in mall. To avoid the long queue in billing section, the project develops smart trolley system in shopping mall. The below figure1 proposes a system implementation of wireless technology using Raspberry Pi. Here, the purchased item name along with the related item price and weight is displayed on the LCD screen.

- System creates a better, faster and more efficient shopping experience for theusers.

- It minimizes the man-power required at the shopping mall, as the billing process at the checkout counters is denialaltogether.

- It monitors and notifies cases of deviation and deception, if any, thereby making the system impress not only to the customers but also to the

storeproprietor.
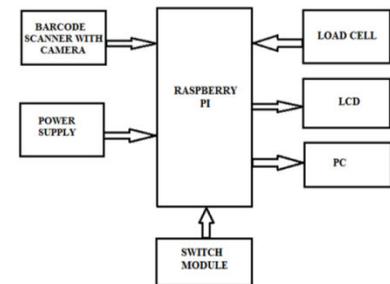
Figure1: Smart trolley system

Every Shopping Trolley is supplied with a low powered raspberry pi running on Raspbian OS that serves as a host for local processing and bill generation and verification. A load- cell fitted at the base of the trolley whichmeasures the weight of the trolley contents. A transportable barcode scanner fitted onto the trolley serves the point of scanning the individual item for identification. Hence, the system handles the case of disfigured barcodes. An alarm present in the trolley is set off, in case of discrepancy the buzzer is sensed and sounds a beep if, the actual weight on the trolley does not match the weight calculated according to the billcreated.

- At beginning, the customer needs to scrutinize the barcode which is present in the shopping trolley. After the trolley barcode is scanned, the customer can start shopping by first scanning the barcode of each product and then placing them into the trolley. The barcode status and the trolley identity are transmitted over the main server via the WI-FI.

- In the main server, the data which is obtained by the control PC will be collected and stored. The Graphics User Interface software matches the information with the database and

sends the details about the item including the item name, weight, and price.

- When a product is put into the cart, the load of the product is computed and transmitted to the main server via Wi-Fi. If the load of the item is calculated by the load-cell is not similar to the actual weight of the product stored in the main database, then it is contemplate as a dispute and an alert message is sent to main server and the buzzer mounted to the cart will start beeping.
- If the customer wants to cut any item from the trolley, they must first scan the corresponding product barcode, which will be notified through a message on the LCD as product deleted.
- Finally, when the customer ends shopping, they should turn OFF the switch corresponding to the scanner and turn ON the billing switch. The total bill will be created on both sides, i.e., in shopping trolley and the main server. The customer then proceeds towards the billing counter to pay the final amount. In case of any detected dispute, the particular trolley will be dispatch for a self-checkout process.

4. RESULT

Snapshot 1: Initial Setup of the System

Snapshot 1 description:

The steps are followed:

- The above snapshot 1 shows the initial setup of the system.
- Initialize system i.e. power up raspberry pi, initialize LCD, load cell.

Snapshot 2: Total Amount Displayed

Snapshot 2 descriptions:

The steps are followed:

- The above snapshot 2 shows total amount displayed.
- After shopping is completed, to pay final bill in counter, switch on billing button.
- Bill will be generated main server where bill has to be paid.

Snapshot 3: Message Displayed on Theft

Snapshot 3 descriptions:

The steps are followed:

- Initially if first product is put into the trolley without scanning, there will be a buzzer to indicate theft. Once product which is not scanned is removed from trolley then buzzer goes off.
- All products are scanned and put into trolley, if there is a product which is not scanned and put into trolley and then tried to bill, and then there will be a buzzer.

5. CONCLUSION

The Automated Shopping Trolley for Billing System it is concluded that shopping trolley can be implemented with microcontroller and provides various functionality such as billing, item recognition, information, weights of purchased items.Also the system will reduce the rush at the billing counter and save the valuable time of customers. As the whole system is becoming smart, the requirement of manpower will decrease, thus benefiting the retailers. Theft in mall will be controlled using this system, which further adds to the cost efficiency.The time efficiency will increase phenomenally since the system will eliminate waiting queues. More customers can be served in same time thus benefiting the retailers and customers as well.

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