

Smart Shopping Facilitator for Blind

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Abstract: Disability is the state of a person in which one has to depend on others for their own needs. Visual impairment is one of the disabilities of a human being. To date numerous methods had been proposed to enhance the life style of visually impaired and blind people. Still purchasing products in the supermarket without others support is tricky one for them. The paper describes a system that provides the guidance for them to identify and purchase their products in the supermarket. Quick Response code (QR code) technology is implemented to identify the product which is far better than existing RFID technology. The audio instructions will assist them inside the supermarket based on the real time situations. It provide obstacle detection to navigate inside the supermarket without colliding with any 3D object. To make the supermarket in a smarter way the billing system is automated. Hence it eliminates the existing queuing system in the supermarket. The ultimate aim of this system is to eliminate others support for visually impaired people in shopping and provide them a convenient and sophisticated environment. On implementing this system, it facilitates the blind people shopping, save the customer's time and promotes business sales. And using IOT product price is compared with market price.

Keywords: IOT, QR code, RFID.

I. INTRODUCTION

In this smart world, no one can end up the day without using any kind of embedded system products. It makes our human life very smarter and to feel comfortable. In worldwide, the great regret factor is visual impairment. Based on the statistics of World Health Organisation (WHO) in 2012, 285 million people are visually challenged in the world. Among them 39 million people are blind and 246 million having low power vision. About 90% of them are living in developing countries. Shopping mall is a place where people get their daily necessities ranging from food products, clothing, electrical appliances etc. Sometimes customers have problems regarding the incomplete information about the product on sale and waste of unnecessary time at the billing counters. Continuous improvement is required in the traditional billing system to improve the quality of shopping experience to the customers. Now day's numbers of large as well as small shopping malls has increased throughout the global due to increasing public demand & spending. At the time of festivals, special discounts, holidays, etc. there is a huge rush in shopping mall. At present, many supermarkets still adopt traditional shopping mode and bar code scanning, which is a waste of manpower and material resources. Also, long time waiting to pay and the tire of pushing shopping cart all make clients suffer a lot and may cause passenger volume go down. Consequently, the needs to help reduce queuing time for customers to check-out and to free people from pushing the shopping carts hard have been an urgent issue to tackle. So here the paper introduces a system to reduce and possibly eliminate the total waiting time of customers and can avoid manpower. Here the system mainly meant for blind people, it provides obstacle detection. Also the system helps to find the required products from the shop. Here it uses QR code technology to identify the product and to determine the position of the item as well as the person. The rate and name of each product taken by the person is added to the bill in addition it is displayed in the LCD and is announced using speaker. The billing can be done within this trolley. IOT connected helps to compare the rate with outside market price and also the shop keeper can have complete access of details of product purchased by the person.

II. PROPOSED SYSTEM

Paper introduces a smart shopping facilitator for blind. The system mainly meant for blind can also be used for normal people. Automatic Billing is introduced in the trolley. And swiping of debit/credit card can be done within the system. So that waiting long for billing can be avoided. The trolley is IoT Connected - So that user can compare the rate of each product with market rate and can know about available offers. Ultrasonic sensors (HC-SR04) are used for obstacle detection. Audio instructions help the blind to navigate inside the supermarket. The guidelines are given to select products. While reading QR code all the details about product are given through the microphone (Auxout).

The system consists of following modules:

- Raspberry pi for programming and controlling.
- DC power supply to supply voltage to each block.
- Ultrasonic sensor for object detection.
- MIC for audio input and output.
- Buzzer to provide alert sound.
- LCD display to display the details of product.
- Camera as QR code reader.
- WIFI for the comparison with market price.
- Switches to select mode.
- Servo motor for closing and opening of trolley lid.

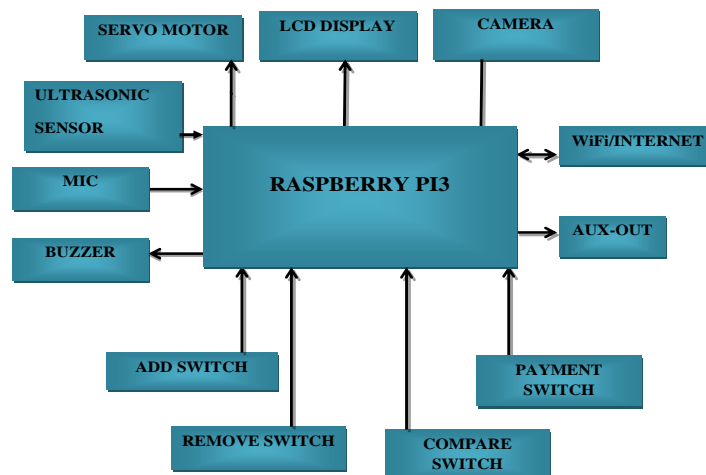


Fig. 1: Block Diagram of Proposed Model

III. WORKING

Here the main technology used is QR code to identify the products and position of the person. Using MIC the customer tells the name of product, it is taken as the input. Aux-out device speaks out all details and the location. Ultrasonic sensor is used for obstacle detection. It helps the blind to navigate inside the supermarket or hypermarket without colliding with any 3D object. While dropping each product in to the shopping basket the camera reads the QR code and is indicated by a small buzzer sound. After the reading of QR code all the details of the product is announced using aux-out. At the same time all the details are displayed in the LCD display. QR technology itself is used for the position determining of the person. And there are four switches, with which the customer decide whether to add or remove the product from the bill. If add switch is pressed the basket lid is opened. Then only customer can drop the product into the basket. Opening and closing of basket lid is done by a servo motor. When the product is dropped into cart the product details will be added to the bill. At same time by pressing remove switch the basket lid will be open so that the person can take back the product. And the amount of the product will be deducted from the bill. There is also a compare switch which helps the customer to compare the product price with market price, so that the person can decide whether to add or remove the product. And finally the payment switch to finish shopping and do the payment. The instruction about switches and supermarket is given to the customer at the beginning using auxout. And at the same the guidance are provided through it. Here the shopkeeper can access every details of purchase and also details of remaining products in the shop using website. And finally billing can be done within the cart itself.

IV. ADVANTANTAGES AND DISADVANTAGES

A. Advantages

- IOT Connected - So that user can compare the rate of product with market rate and realize available offers.
- QR Code Enabled - Simple system low cost than RFID also smaller as a sense of industrial product.
- Obstacle detection - For blind people.
- Each products in different shelf can be identified.
- Voice enabled - Useful for blind.
- Billing is introduced.
- Can be used by normal people also.

B. Disadvantages

- Difficult for small scale vendors to implement.
- Requires constant battery backup. This requires constant care as customers tend to get upset when the trolley runs out of power during the middle of their shopping time.

V. RESULT

The main aim was to design and build a prototype and implementation of a shopping trolley for blind people. The hardware and software were well integrated together. The hardware is able to detect the obstacles and QR code on the product is read using camera. Voice system is also enabled such that all the details of the product can be heard through headset or speaker. Comparison of product price with market price is also achieved. Billing system is also automated.

VI. CONCLUSION

The smart shopping trolley application creates an Automated Central Billing System (ACBS) for supermarkets and malls. using pid (product identification), customers will not have to wait near cash counters for their bill payment. Since their purchased product information is transferred to central billing system, customers can pay their bill through credit/debit cards as well. The proposed smart shopping trolley system intends to assist shopping in-person which will minimize the considerable amount of time spent in shopping as well as to time required in locating the desired product with ease. The customer just needs to speak the name of the product, and the cart will automatically guide him/her to the product/s locations. The system proposed is highly dependable, authentic, trustworthy and time-effective. There will be reduction in salary amount given to employees and also reduction in theft since it reduces the manual tasks.

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