

An Effective Embedded Smart Shopping Cart using QR Scanning Code

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Abstract-This paper presents the development of smart shopping trolley for super market. This smart shopping trolley reduces the shopping time of customers. This project works on microcontroller, RFID Reader & Node MCU for payment, HTML to define the content of webpages, CSS to specify the layout of webpages, JavaScript to program the behavior of webpages, node.js to handle a file request, MongoDB to provide high performance, scalability and flexibility in querying & indexing data. Due to the lifestyle and demands, majority of human beings are becoming increasingly occupied, need of the hour is to get all personal works done easily with minimum effort and time-consumption. Shopping at malls is a frequently carried out activity. Often there is big rush at malls on holidays, weekends especially during special offers and discounts. This project is outline the development of smart shopping cart which deal with the placement and extraction of products in the most effective way in the urban areas. For the on-time shopping, the customer select the desired product to add the selected product to the cart and the users used their shopping carts as a smart cart that automatically calculated their bill. The project consist of smart-phone application for facilitating all easy method in mall for shopping and also the navigation system is added in the application where we got to know about the particular product is placed. The data will be saved in the main PC/computing machine and a SMS will be sent to customer for instant billing.

Key words - Smart Shopping Cart, RFID Reader, smart card, Node MCU.

I. INTRODUCTION:

Smart Shopping has become a most important place in everyone's life. Just to make shopping easy and to save our time we will be designing a product. The mall link and details will be open in our phone including navigation of particular mall through application. Then we will register

the cart on our email id using cloud technology. Each product will have the QR code which will be scanned by a mobile scanner of application. As we will put the items in our cart will read the tag and cost & quantity will display on our phone which has already been registered. After completion of our shopping the message will be send to the main PC through via email id. After complete shopping total amount is generated and it will display on our smartphone, then customer will pay the bill amount on counter.

II. LITERATURE REVIEW:

"Development of Smart handcart with Customer Oriented Service", July 7, 2016 published in International Journal of Innovative Research in Science-By Hsin-Han Chiang, Wan-Ting You, Shu-Hsuan Lin, Wei-Chih Shih, Yu-Te Liao, Jin-Shyan Lee, and Yen-Lin Chen This paper presents a preliminary development of the smart handcart (SSC) which will be integrated into the smart mall system. With the use of radio-frequency identification tags, the smart cart can automatically detect the varied products which are being added within the cart and show the related information on the interface. The automated billing service are often done by the SSC and therefore the stored shopping data are going to be transmitted to the cloud server of mall. The experimental demonstration shows the effectiveness of the proposed Smart Shopping Cart. The which interacts with the customer and provides efficient shopping service.

"Smart Shopping using QR codes for Bill Calculation and RFID systems", Volume: 04 Issue: 04 | Apr -2017 published in International Research Journal of Engineering and Technology-By Rhythm

Mehta, Dhruva Ashok, Anshul Ahluwalia, Prof. Siva Rama Krishnan .The paper is to optimize this process of shopping at a mercantile establishment , by enabling the

customer to handle the check-out process. We propose to try to this by employing a smart phone application that permits the user to scan the products he or she wishes to get, generate the bill for all the products selected, and make the payment. Rather than using traditional bar codes, we propose to use Quick Response (QR) codes to spot each product. The appliance includes an choice to search where a product is found within the store. The whole process of bill generation is automatically administered, and is displayed on the interface because the user continues shopping. Once all the things are scanned and therefore the user confirms the acquisition order, the ultimate bill is generated and therefore the user is be redirected to payment options. The customer has the choice to check in for a custom wallet which will be used for faster payment.

“Smart Trolley System for Automated Billing using RFID and IOT”, Volume- 05 Issue: 04 | Apr-2018 published in International Research Journal of Engineering and Technology-By Pritha N, Sahana S, Selvin Stephy N, Shiny Rose S, Unnamalai S. In this paper, a secure smart shopping system utilizing RFID technology is used in enhancing shopping experiences and security issues. The smart shelves are ready to monitor the things on the shelves by reading the RFID signals from the tags. In this system, a cheap RFID tag is embedded within each product. When the merchandise is placed into a sensible cart, the merchandise detail is automatically read by the cart equipped with an RFID reader. The smart carts are ready to read and retrieve information of the things inside the carts and eventually, the checkout points can validate the acquisition made by a customer.

The main objective behind creating this application is to overcome the problem of the customer. Just to make shopping easy and to save our time we have designed this product. Thus the researchers have created the application in such a manner which saves the time of a customer. Based on the concept this project works on microcontroller, RFID Reader & Node MCU for payment, HTML to define the content of webpages, CSS to specify the layout of webpages, JavaScript to program the behavior of webpages, node.js to handle a file request, MongoDB to provide high performance, scalability and flexibility in querying & indexing data.



Fig -1. Queue in mall



Fig -2. Shopping trolley

III. METHODOLOGY:

We propose a system that has a mobile application, which will be downloaded onto any smart-phone. We propose to use QR codes to identify the products, instead of barcodes. We have designed a module consist of microcontroller ATMEGA328 and Node MCU for billing of the product.

SMARTPHONE APPLICATION:

The smart phone application is one that will provide a User Interface (UI) to interact with the products, by means of adding it to a personalized cart. The customer will access the smart phone application for shopping once they have been authenticated via link. The application has a feature that will access their smart-phone camera and the application will allow a user to pick up a product, scan its QR tag and thereby add it to the cart. The UI will display updates with the current product's details and the total bill auto-increments. The UI is having the option to scan the product and add it into the cart. The application will also be able to tell the users which section of the store a particular product is placed. This will enable the user to quickly find what he or she is looking for and bypasses the hassle of standing in long queues to get their items checked out.

HARDWARE MODULE:

At MEGA328 is an 8-bit and 28 Pins AVR Microcontroller, manufactured by Microchip, follows RISC Architecture and features a flash type program memory of 32KB. We have heard of Arduino UNO, UNO is predicated on At MEGA328 Microcontroller. It's normally utilized in Embedded Systems applications.

EM-18 is employed like all other sensor module. First we elect the mode of communication between MODULE and CONTROLLER. Next we'll program the controller to receive data from module to display. Next power the system. When a tag is brought near the MODULE it reads the ID and sends the knowledge to controller. The controller receives the knowledge and performs action programmed by us. NodeMCU has Arduino like Analog (i.e. A0) and Digital (D0-D8) pins on its board. It supports serial communication protocols i.e. UART, SPI, I2C etc.

IV. RESULT AND DISCUSSION:

The project result is as follows:

The user used the smart shopping cart and got the result in the form of bill directly on the application provided by the retailer. The user had got the link provided in the mall and an application had opened in the smartphone of the user.

The performance of the smart cart depends on the node MCU and At MEGA328. The main purpose of the smart

shopping cart system is to provide the services in the malls crowded shopping shops for these people who are very busy regarding their schedule are not able to take much time at shopping malls. This problem is been called by this system. This model provides the suggestions for the particular mall and navigation.

Here, the user took the item from the shop and scanned it by the mobile through the scanner provided in the application. Where after scanning the details related to the item had shown in the mobile application. As soon as the customer press the send button the complete data is sent to main pc of the mall at billing counter via server and customer had paid the bill through RFID card which is already been registered.

Thus, this had made shopping and billing process easy and convenient.

V. CONCLUSION:

Our shopping cart provides the smart assistance to the customer in the shopping mall for all the items they purchase. We had designed this system because of the increasing population in our country. This system can be used in every shopping marts. As we know that everyone is busy in their day to day schedule and want to save their time in every possible way. This scenario can be better understood by walking through the malls or markets. Thus, this smart shopping cart helps the customer to assist them and help for shopping conveniently which will ultimately increase or improve the efficiency and performance of the shopping malls by decreasing the queues and time required for shopping.



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