

A SMART TROLLEY DESIGNED BY USING HC-05

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Abstract—Today the Android applications are broadly used in various fields. So the People focus on the new technology to make their life easy and finding the solution for their problems. When we go for the shopping we have many difficulties like finding the place of the products, to know the expire date of the product and also standing long time for the billing. This paper discuss about the RFID reader and tag for finding the expire date of the product, in case if its expire it produce the buzzer sound and the payment was done by smart card. The smart app is used for the finding the place of the product. The app was named as Bluetooth terminal HC-05. During the purchasing of the product we get many offers and discount in the product like buy one get one , combo offers etc. such type of offers are also programed in the smart trolley. The purchased details will be updated in the cloud channel.

Keywords— RFID reader, RFID tag, smart card, Smart app, buzzer.

I. INTRODUCTION

Today's world have the various type of demand from a variety of domains. For the successful shopping the customer have to spend more time in the supermarket. By using the efficient technology we solve this problem. Humans invent and develop a technology that will make their work easier and consume their time. By using the RFID we increase the speed of the shopping. On the off coincidental that the item is placed in to the trolley implies it will demonstrates the sum and furthermore the aggregate sum. Be that as it may, in this smart shopping framework RFID tag is utilized for getting to the items. So this RFID tag enhances the security execution and furthermore the speed. RFID is the extraordinary kind remote card and the embedded chip is inbuilt with loop antenna. The RFID reader creates the magnetic signal and thus signal was transmitted by the loop antenna and thus the circuit is used to read the RFID tag number. Each and every tag is individual, because it give the name of the item. Product Identification Device is design and implemented in each trolley. During shopping the customer purchasing and returning item and its cost also will be updated in the cloud channel by the IOT modum this updation is for the customer future reference. To find the place of the product in the shopping mall the smart app called Bluetooth terminal HC-05 is used.

II. REVIEW OF LITERATURE

[1] In this paper they develop the automatic human and line following shopping trolley with the smart shopping system. A line following shopping trolley was installed by portable robot and it also helps the user to find the item location that the plant to purchase in the mall.

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[2] In this paper, ground breaking concept of RFID based smart shopping cart in the field of retail merchandise. This problem was solved by replacing the ubiquitous universal product code (upc) bar code by smart label know as radio frequency identification tag. This idea help as to solve the time spending and eliminating the daily hassle of locating the right product and standing in long lines.

[3] This paper develop a smart shopping cart system that will track the purchasing product and also online transaction for billing using RFID and Zigbee . This system also gives the suggestion for buying the product based on the customer purchasing history from the centralized system.

[4] This paper consists of 4 key modules (i) Product Detection (PD) (ii) Product Recommendation (PR) (iii) Budget Setting (BS) and (iv) Automatic Billing (AB). PD is used to detect the product placed in shopping cart using RFID technology, meanwhile PR facilitates providing relevant product information and ongoing offers. BS helps to set the budget if purchase cost reaches the budget value a buzzer buzzes. AB generates the bill as the cart reaches the billing counter server through RF communication. These 4 modules are integrated into an embedded system and are tested to satisfy the functionality.

[5] In this paper they proposed about the smart shopping cart. This help them for tracking the details of the product and the purchased product are updated in the online for billing this process was done by the RFID. By the user purchasing history it will provide the suggestions for the product to buy.

[6] Human-Following Mobile Robot in a Distribute Intelligent Sensor Network proposed Kazuyuki. M., Lee, J-H.and Hideki solves that the robots that will be needed in the near future are human-friendly robots that are able to coexist with humans and support humans effectively.

[7] In this paper, RFID equipped shelves and shopping carts for automating purchases in stores is presented. The aim of this paper is to reduce the long queues in the billing section. The first instance, the shelf is transistorized with a weight-sensing mat which is integrated with a RIFD reader, thus making a shelf smart. The second instance illustrates a shopping cart, equipped with a tag and a weight-sensing matt integrated with a RIFD reader that can verify the purchase of the items as the items are dropped into the cart.

[8] In this paper, the aim of the system is to deliver the urgent notification to the students at their respective locations. This system is also able to display personalized information based on the students' preferences and current location when accessing the system. The background of the study, the design approaches for this system and the preliminary evaluation of the prototype are presented in this paper.

[9] The more innovative projects are welcome by the shopkeeper to reduce the man power and time consumption. The aim of the innovative projects is to reduce the time for the billing even one or two products has to wait in a queue for the billing. The customers have to add the products after a short scan in trolley and when done the finalized amount will be displayed in the trolley. Customer could either pay their bill by their ATM cards or through pre-recharged customer card provided by the shop.

III. EXISTINGSYSTEM

In the existing system we use the shopping cards which help them to solve the problem and also provide a better shopping experience. In this system we use the app which mainly helps for navigation of the item's location and automatic billing for their product that they purchased. This app was communicated by the device called Bluetooth. The function of the app is to establish a connection between the user and smart card. The app and card were connected by the Bluetooth. The app has the Android operating system so it runs on all the smart phones. The app has different pages; each page has a specific purpose. On opening of the app to allow the permission for the app to access the Bluetooth from the mobile. It displays whether Bluetooth is on or not. In the first page the user connects the app to the shopping card. The message indicates the status of the connection. When the connection is successful, it reaches the second page; if not, it shows that the connection fails and an error message will appear. The second page shows the central location of the app and also shows different options like navigation, billing, map, status etc. Each and every option has a specific button. The map consists of the layout of the supermarket. By this map they find the location of the items in the store. The item in the shopping mall and the position of the item will be changed frequently; it was updated in the map. Additionally, it provides the feedback and the shopping experience in the app. For the navigation, the navigation button is on the user is taken to a page which shows two options named as 'manual' and 'fixed'. Each of these options has different pages. The manual page contains five buttons namely front, back, left, right, stop. By using the option the cart can be moved in the corresponding direction. In the fixed section consists of map and each section was numbered separately. During shopping the customer chooses the number from the drop down menu. By choosing their desired destination the application sends a message about the chosen location to the cart and the cart moves automatically based on the data given. After the purchasing of the product the billing has to be done. For that billing system gets on, it contains a separate page. The page contains the list of items purchased by the customer. The Arduino software is used for read and write the data. The name and cost of the product are added when the customer scans the product in the reader. In the existing system we find the solution for locating products in the supermarket without any assistance and also a specific map helps them to locate the product in the store. The automatic scanner is used to scan the items put in the shopping cart and the cost of the item can be viewed; this helps them to track their expenditure.

IV. PROPOSEDSYSTEM

In the proposed system we implemented a new technology; this technology makes the customer's life easier and efficient. The human being spends a substantial quantity of time in purchasing. Shopping is considered as a simple process but during shopping more difficulties are faced by the customer. This influenced us to construct an

revolutionary not only make the buying efficient however also enjoyable and convenient to the customers. In this paper we proposed that finding the expire date, manufacturing date of the product. If the product was expire it alter the customer through the buzzer sound. The buzzer was fixed in the trolley used by the customer. The trolley is first connected with the mobile application of the customer. The trolley and customer was connected by the device or the application called Bluetooth. After that the customer can start their shopping by scanning the products in RFID reader which is fixed in the trolley .The RFID reader which reads the tags on the product and list of the scanned products. The scanned products will be displayed in the display fixed in the trolley. The display not only show the list of product purchased it also shows the manufacture and expire date of the product and total amount of the purchased product. During the purchasing of the product we get many offers and discount in the product like buy one get one, combo offers etc. such type of offers are also programmed in the smart trolley when we purchase these kind of product it shown in the display of the trolley automatically. Smart app is used for finding the place of the product. The app is named as Bluetooth terminal HC-05 it is shown in the Fig1. Billing is done by the smart card, product purchased by the customer automatically send to the billing section and updated in the cloud channel. In the cloud channel the customer purchased item will be stored and it help them for their review. The data updated in the cloud is also send to the seller server it is shown in the Fig2.The amount paid by the customer is verified by the SMS and the message also send to the shopping mall sever.

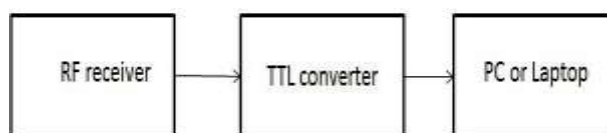


Fig1



Fig2

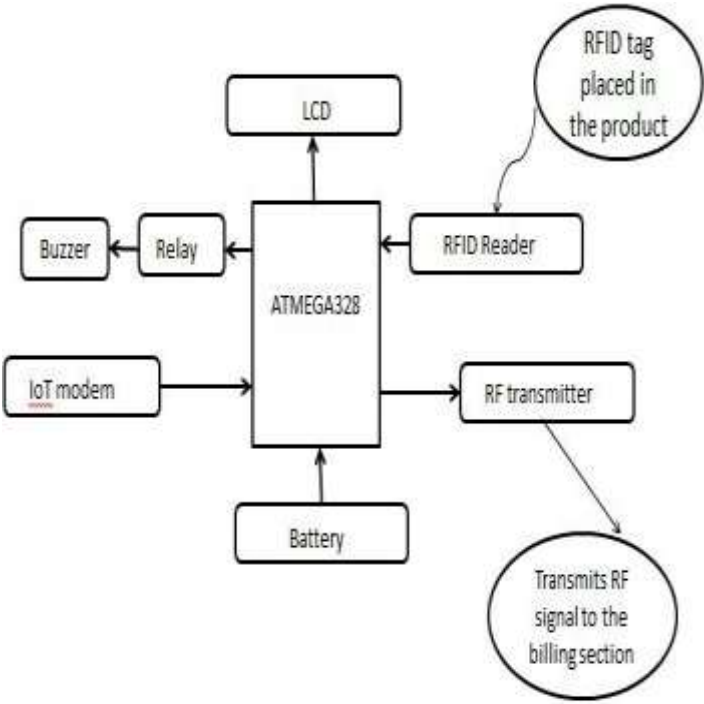


Fig3

Fig 4

Working



The above Fig 3 is the block diagram of smart trolley. The block consists of ATMEGA328 microcontroller, RFIDreader, RF transmitter , Buzzer , Relay , LCD display , IOT modem , Battery. The RFID reader is provided in the trolley, the purchased product consists of RFID tag each and every product was scanned in the RFID reader and it was transmitted to the billing section through the RF transmitter. The RF receiver is present in the billing section which collect the data from the transmitter. When the product get expire the relay get operates and buzzer gets turn on. The IOT modem is used for updating the product details in the cloud channel. The LCD display is used for display the expire date, manufacturing date, total cost of the purchased product it is shown inFig5&Fig6



Fig 5



Fig 6

ATMEGA328: The ATMEGA328 is Arduino Uno based microcontroller board. It has 14pins of digital input and output pins. The microcontroller is the main circuit of transmitting and receiving the data and also it controls the overall process. The pin diagram of ATMEGA328 is shown in fig 7

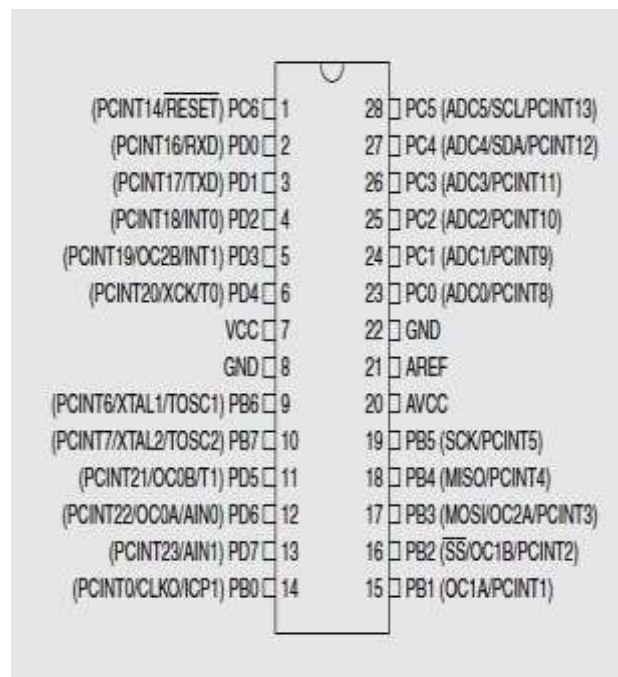


Fig 7

RFID

The RFID is a highly integrated card reader. This card reader is used in the project to scan the products. This reader can communicate directly to the CPU board by connecting to the SPI protocol. This module uses the 3.3v power supply. This reader is low cost and reliable.

RFID Tags

The RFID tag is used for identifying the name of the product when the tag was scanned by the reader. It shows the name of the product and the details of the product. This tag processes and stores the information and also it is used for transmitting and receiving the signal.

RF Module

RF module consists of RF transmitter and RF receiver. It is used to transmit and receive the radio signal and it is a small electronic circuit. It selects one out of a number of carrier frequencies.

RFID Scanner

The scanner scans the RFID tag which is attached to the product. After scanning the details of the product like name of the product, price etc. are displayed on the screen which is mounted on the trolley.

TTL Converter

TTL converter acts as an intermediate between the receiver and the laptop. It receives the logical signal from the

receiver and converts the logical signals to display by the converter.

Display Screen

It shows details of the scanned product in the software application. It displays whole product list purchased by the customer and its total billing amount. The number, characters and graphics are display in the LCD display. The LCD display interfaced with the I/O port of the microcontroller. In the display it display the cost of the product, name of the product, manufacturing date, expire date of the product, total cost of purchasing these all display when the product scan in the RFID scanner

V. CONCLUSION

In this paper we design a Smart Trolley by using the RFID System. By this system the customer are no need to wait for long time in queue . This paper also make the shopping in the smart way and easier. In this paper we have implemented a technique for finding the Expire date of the product and providing the app which help them to finding the place of the product. This technique help them to reduce their time and make their shopping in smart way. In the trolley we fix the display which help the people to know the data (item, cost of the item). The data are continuously stored in cloud channel. Especially in the course of weekends or gala's season, there may be no time wastage in waiting in the queue. The customer can dobilling directly through the application or even at the billing counter. So, supermarkets or hypermarkets can use this concept, so one can entice a more range of clients and also the purchasing made easy for the customers.

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