

Smart Trolley for Shopping Malls

Swagata Desai¹ Samiksha Nalawade² Mane Rohini³ Prof. Poonam Yewale⁴

^{1,2,3,4}Department of Electrical & Electronics Engineering

^{1,2,3,4}Keystone School of Engineering, Pune, India

Abstract— The new modern technology has increased the standard of living for the humans. Every one of us craves for a quality of product everything we use in our daily lives. So, this has resulted in a large number of crowds at shopping malls which have to lead to long lines at the billing counter because the cashier has to scan every product item and then enter it into the billing record. The prevailing billing system is a bit time-consuming process. So, we thought of inventing a remedial electronic product to catch-up with this problem. We call it "Smart Trolley for Shopping Malls using pic 18F458". This is based on the pic microcontroller fitted with an LCD and BARCODE scanner on a trolley and a wireless network to work even at long distance due to its wide range. The brief description of its operation is, when you pick a product from the mall and drop it into the trolley, the RFID scanner scans the product's unique code and its price. And it gets displayed on the LCD screen. So after a customer has finished with the shopping has to visit the counter and pay the bill as displayed on the LCD screen fitted on the trolley. This will save a lot of the time that was earlier being consumed to scan each item.

Key words: Smart Trolley, Digital Trolley, Pic 18f458, Zigbee, Barcode, Instant Billing

I. INTRODUCTION

Now a day's maximum operation is based on the automation but then for billing we have to stand in long queue where automation is not there in billing system. Based on automatic barcode scanning method we can reduce the waiting time for billing the products and reduce the manpower. Day by day we try to reduce the man work but for scanning and billing process still us depending on the man power. The objective of the project is to design a smart trolley which will assist the customers in shopping by automating the billing process on the trolley itself which can easily be used by common people. The system should also keep a check upon total number of purchased and billed items in order to avoid wrong billing. The customers should drop every product which they wish to purchase into the shopping trolley and then proceed to checkout at the billing counter. The billing process is quite tedious and highly time consuming and has created the need for shops to employ more and more human resource in the billing section, and yet waiting time remains considerably high. This project is designed to reduce and possibly eliminate the total waiting time of customers, lower the total manpower requirement and expenses for markets and increase efficiency overall.

II. LITERATURE REVIEW

Mohit Kumar, Jaspreet Singh[1] This product is basically an embedded system that uses arm7 lpc2148 microcontroller. The motive of smart and quick billing is accomplished by interfacing RFID and ZIGBEE module with the microcontroller. Janhavi Iyer, Harshad Dhabu[2] The advent of wireless technology along with other communication

techniques has helped in making electronic commerce very popular. A modern futuristic product is the one that aids the comfort, convenience and, efficiency in everyday life. In this project, we discuss an innovative concept of RFID Based Smart Shopping and Billing trolley System. The main aim is to provide a technology-oriented, low-cost, easily scalable, and rugged system for aiding shopping in person. Anjali Verma, Dr. Namit Gupta[3] The proposed research evaluates various strategies to assist shopping for a consumer to reduce the shopping time in the mall at the same time provides equal opportunity to aid the store management by providing real-time updates on the inventory. Galande Jayshree, Rutuja Gholap[4] Our aim is to design a system that can be used in shopping malls. The system will be placed on all the trolleys in the mall. It will consist of an RFID reader and ZigBee. All the products in the mall will be equipped with RFID tags. When a person puts anyone products in the trolley, its code will be detected and the price of those products will be stored in memory. As we put the products in the trolley, the costs will get added to total bill. Thus the billing will be done in the trolley itself. Item name and its cost also will be displayed on the LCD. The products name and its cost can be announced using a headset. At the billing Counter, the total bill data of all trolley will be transferred to PC by wireless RF modules. Udita Gangwal, Sanchita Roy[5] In this paper, we describe the implementation of a reliable, fair and cost-efficient Smart Shopping Cart using Wireless Sensor Networks. Such a system is suitable for use in places such as supermarkets, shopping mall where it can help in reducing manpower and in creating a better shopping experience for its customers. Instead of waiting in a long queue for checking-out their shopped items, the system helps in automating the billing process. Along with this ability, the system design also ensures detection of cases of deception invoked by dishonest customers, which makes the smart system fair and attractive to the buyers and also for sellers. The results are encouraging and with the use of repeaters at appropriate locations inside the supermarkets, our approach illustrates itself to be conceivable for use outside the laboratory, in a real-world deployment. Mr. Mayur Subhash Chaudhari[6] This paper looks into the use of an interactive bracelet that communicates with the RFID system by mean of a database application. This paper focuses on the RFID technology, and different ways of its usage for security in areas like shopping malls, employee and student's identification, patient details monitoring system.

III. EXISTING SYSTEM

The Currently available method in shopping malls is the barcode method. The cashier scans the product through the barcode scanner and gives us the total bill. But this becomes a slow process when lots of products are to be scanned which eventually results in long queues, making the billing process slow. While doing a survey we found that most of

the people prefer to leave the shopping mall instead of waiting in long queues to buy the products. To solve the problems previously identified, recent years have seen the appearance of several technological solutions for hypermarket assistance. All such solutions share the same objectives: save consumers time and money and help the retailers to win loyal clients.

IV. PROBLEMS ASSOCIATED WITH EXISTING SYSTEM

Today purchasing various items in malls or supermarkets require a trolley. Product procurement represents a complex process. The customer has to pull the trolley from rack to rack for collecting items and simultaneously customer has to perform estimated expense computation. At the end, a customer has to wait in the long queue for billing and payment.

V. REVIEW ON DIFFERENT TECHNOLOGY

[5] Smart trolley with instant billing to ease Queues at shopping malls using Arm7 lpc2148: a review:- The modern technology has increased the standard of living for the humans. Every one of us craves for a quality in everything we use in our daily life. So, this has resulted in large crowds at shopping malls which have to lead to long lines at the billing counter because the cashier has to scan every product item on barcode scanner and then enter it into the billing record. The prevailing billing system is a bit time-consuming process. So, we thought of inventing a remedial electronic product to catch-up with this problem. We call it "Smart Trolley with Instant Billing to Ease Queues at Shopping Malls using ARM7 LPC2148: A Review". This is based on arm7 microcontroller fitted with an LCD and RFID scanner and a wireless ZigBee. The LCD used is a 16x2 and ZigBee modules make the wireless network to work even at long distance due to its wide range. The brief description of its operation is, when you pick a product and drop it into the trolley, the RFID scanner scans the product's unique code and its price. And it gets displayed on the LCD screen. So after the customer has finished with the shopping customer has to visit the counter and pay the bill as displayed on the LCD screen fitted on the trolley. This will save or reduce the time that was earlier being consumed to scan each item.

[6] Smart Trolley System for Automated Billing using RFID and ZIGBEE:- In our Futuristic Billing Trolley System environment, each product will have the passive Radio Frequency ID tag which is bearing a unique Electronic Product Code. This Electronic Product Code provides the information about the product i.e. its name and cost. When the customer puts the product in the Smart Trolley, the RF-ID scans the tag and the Electronic Product Code number is generated that is previously known by RFID reader. Radio Frequency ID reader passes the Electronic Product Code to the microcontroller 89S52 where the controller compares the Electronic Product Code with the database of the system having various products. After that, the name and price of the product obtained by the controller gets displayed on the LCD display of the Smart Trolley, where the user can see all the product information. The microcontroller 89S52 also passes the data obtained from

the database to the ZigBee transmitter from where the data is wirelessly transmitted to the billing counter computer. The computer receives this data through ZigBee receiver using Max 232 interface. Thus the final information of all products with the bill is transmitted to a computer with the help of serial communication.

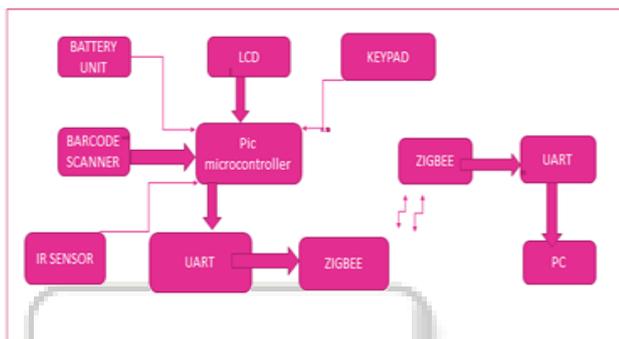
[7] RFID based Smart Multitasking Shopping Trolley System:- The characteristic of an innovative product is measured on the parameter of how much it adds comfort, ease and proficiency to the everyday life at the same time having value addition on the social aspects. The trend of purchasing the smallest of the good from a shopping mall is observed quit casual nowadays as seen in the regular advertisements of different cost-effective purchases of daily utility goods by different shopping destinations. This strategy and trend have pulled masses towards the shopping mall. After the purchase of the variety of items, the customers will have to stand in long queues for bill payments as the billing counters are very limited as compared to the number of shopping items on board. To increase the pace of a billing process, Radio Frequency ID technology has been used significantly since long, thus providing many new services and convenience in the retail environment. The RFID technology provides reading the code (RFID tag) at the cashier end to quickly count the number of items purchased, thus saving time to stand in long queue. In the proposed review paper, different techniques used to design the RFID based smart multitasking shopping trolley are compared and contrasted. One which makes use of RF module protocol. [8] RFID Based Automatic Billing Trolley:- In Shopping mall where people get their daily necessities ranging from food products, clothing, electrical appliances, footwear etc. Now day's numbers of shopping malls have increased throughout the globe due to increasing public demand. Sometimes customers have problems due to the incomplete information about the product on sale and waste of many time at the billing counters for billing. Continuous improvement is necessary in the traditional billing system to improve the quality of shopping experience to the customers. To overcome these problems stated above and to improve the existing system, they have designed a SMART TROLLEY based on RFID. This can be done by attaching RFID tags to all products and an RFID reader with an LCD display on the shopping trolley. With this system customer will have the information about the price of every item that is scanned in, the total cost of the items. This system will reduce the time of customers and manpower required in malls and cost associated with the product.

In this project, we have used Transceiver type RF module. Transmitter modules are implemented with the microcontroller which will provide data that can be transmitted to the module.

VI. PROPOSED METHODOLOGY

Now day's people spend much of time unnecessarily in shopping malls for billing. Some of the product such that grocery items packed without price tag so people do not know that related product price. To overcome these problems we can use BARCODE based shopping system using the smart trolley. Here microcontroller is used to

display the product price and total bill in the LCD display. In the existing system, the cashier scans the product through the barcode scanner and gives the total bill. But this becomes a slow process when lots of products are to be scanned which eventually results in long queues at billing counter, making the billing process slow. While doing a survey we found that most of the people prefer to leave the shopping mall instead of waiting in long queues for billing to buy few products. To solve the problems previously identified, recent years have seen the appearance of several technological solutions for hypermarket assistance. All such solutions share the same objectives: save consumers time. RFID and barcodes are both similar in that they are data collection technologies, meaning they automate the process of collecting data. However, they also differ significantly in many areas



The main aim of project is to provide a technology oriented, low-cost and provide an easy shopping facility to customers. The developed system comprises of the pic microcontroller, 16x2 LCD display unit, barcode scanner, ZIGBEE transceiver and a battery power source. All the items in the mall will be equipped with BARCODE tags. When person want to start shopping it has to select the start button. When person wants puts an item in the trolley, it have to scan item by the barcode scanner which is interfaced with microcontroller. scanner send barcode of that item to microcontroller, after matching code with codes stored in memory, microcontroller reads item's name, cost etc. After scanning the costs will get added to total bill .Thus the billing will be done at the trolley itself .When we want to take any item, that item name on keypad .after entering name of that item on LCD display shows the position of that item in mall. The LCD is used to display item names, item cost etc. Whenever a product is purchased it automatically checks for the expiry date. So it helps us to remove the expired product. If the customer need to 'cancel' a selected product, it can be accessed through scanning the product two times. After completing the shopping, the customer has to select the "Finish" button. This enables the total bill being generated. When customer enters finish button then zigbee transmitter sends the total bill and trolley number to the zigbee receiver which is at billing counter .Then at receiver side on pc all trolley numbers and bill will be display.

VII. ALGORITHM

- 1) Select the start button on shopping trolley.
- 2) Take the items and scan the barcode on items at barcode scanner.

- 3) The buzzer and led will on after successfully scanning of each item.
- 4) Put the items in trolley.
- 5) For searching any item in mall enter the name of that item on keypad.
- 6) For deleting any item from trolley scan that item two times.
- 7) After completing the shopping press the finish button.
- 8) Then LCD display total bill.
- 9) At receiver side total bill and trolley number will be display.
- 10) you have to pay there

VIII. CONCLUSION

By means of this paper, we intend to simplify the billing process, make it swift & increasing the security using Barcode technique. This will take the overall shopping experience to a different level. Different parameters such as the system parameters of smart trolley like products name, products price, product weight etc. Are continuously display Thus with the help of the conclusion we can say that

- 1) Automatic billing of products by using barcode technique will be a more viable option in the future that saves the time of the customer.
- 2) The system based on barcode technique is efficient, compact and shows promising performance.

REFERENCES

- [1] Udita Gangwal, Sanchita Roy, Jyotsna Bapat, Smart Shopping Cart For Automated Billing Purpose Using Wireless Sensor Networks, ICCMIT7026.
- [2] J.S.Awati, S.B.Awati, Smart TrolleyIn Mega Mall, IJETAE-0312-82
- [3] Raju Kumar, K.Gopalakrishna, K.Ramesha, Intelligent Shopping Cart, ISSN: 2319-5967
- [4] Smart Shopping Cart With Automatic Billing System through RFID AND Zigbee,[ICICES.2014.7033996.IEEE]
- [5] Mohit Kumar, Jaspreet Singh, Anju, Varun Sanduja (2015) "Smart trolley with instant billing to ease Queues at shopping malls using Arm7 lpc2148: a review" International Journal of Advanced Research in Computer and Communication Engineering (Vol. 4, Issue 8, August 2015)
- [6] Janhavi Iyer, Harshad Dhabu, Sudeep K. Mohanty (2015) "Smart Trolley System for Automated Billing using RFID and ZIGBEE" International Journal of Emerging Technology and Advanced Engineering (Volume 5, Issue 10, October 2015)
- [7] Anjali Verma, Dr. Namit Gupta (2015) "RFID based Smart Multitasking Shopping Trolley System" International Journal for Scientific Research & Development (Vol. 3, Issue 06, 2015)
- [8] Galande Jayshree, Rutuja Gholap, Preeti Yadav (2014) "RFID Based Automatic Billing Trolley"