



International Journal of Advance Engineering and Research Development

Volume 3, Issue 4, April -2016

MULTIPURPOSE SHOPPING TROLLEY

Gandhi Dhvani¹, Merchant Khushbu², Prof. Bhargav Patel³

^{1,2,3}Electronics And Communication Dept., Madhuben & Bhanubhai Women's Institute Of Engineering
For Studies & Research In Computer And Communication Technology, New V.V. Nagar, Anand

Abstract: The main aim of science is always to make our life easy. A product with societal acceptance is the one that proposes the comfort convenience and efficiency in our life. Shopping in today's life is becoming an increasingly interactive experience. We observed that the main cause of long queue at the billing counter is not the crowd but the time spent in scanning each and every item. In this paper we discuss an innovative concept to implement an intelligent multipurpose shopping and billing trolley.

Keywords: Arduino Mega, GSM, Bluetooth Transceiver (HC-05), Scanner

I. INTRODUCTION

Shopping mall is a place where people get their various daily necessary ITEMS ranging from food products, clothing, electrical appliances etc. As we know that nowadays numbers of large as well as small shopping malls has increased throughout the global as the public demand is also increased.. Sometimes customers do face the problems regarding the 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. There are certain systems developed to make the process easy for customers and to avoid the frustration at the end of shopping experience. Some uses RFID tags to their product and there are some products which uses self checkout points and so on.

Microcontroller based design is the most happening field in electronics. Nowadays in shopping mall for purchasing variety of items we required trolley either it is for daily grocery shopping or for clothes or any other electrical or electronic product. As we now that there is a huge crowd in shopping malls in metro cities especially on holidays and weekends. Every time customer has to do calculation of those items and need to compare it with his budget in pocket. After that At the cash counter billing process is very time consuming and customers feels very frustrated as they have to wait in the queue for their final step of the shopping that is billing process. So, to avoid headache like waiting in billing queue, thinking about budget. We are introducing new concept that is "MULTIPURPOSE SHOPPING TROLLEY" that reduces time spent while purchasing and having a peaceful shopping experience.

II. GENERAL OVERVIEW OF PROPOSED SYSTEM:

In this system we are developing a shopping trolley that helps customer to save their time and give them a worryless shopping experience. here we are going to use barcode tags as they are available on every small item packets. The heart of our system is arduino mega board. We have done all the interfacing using this board. We have had an LCD on the trolley itself which shows the scanned item and total amount. We have used GSM board so that when a person completes his/her shopping the total cost has been send to their respective mobiles and there is no need for them to save the bills for any purpose.

In this we are using a barcode tags to perform the idea of our project .Barcodes have been in existence for many years and are still in use and have been used by departmental stores and supermarkets. The system displays the name of the product and cost.

2.1 Why we choose barcodes?

As we know that today there are so many systems that use RFID for shopping trolley. But here we are using barcodes tags. If compared, RFID technology is found to be more comprehensive than barcode technology. It is possible to read RFID tags from a greater distance but still we are choosing barcode tags for the system. The main reason behind choosing the barcode tags instead of RFID tags are barcodes tags are available on all the various items available on the shopping malls. It is not possible for us to use barcode tags for all the items as there are so many small items available in malls. Also, RFID tags are much costlier than the barcode tags. There for we are designing a system which uses the same barcode techniques which reduces the cost of the system.

2.2 BLOCK DAIGRAM:

As seen from the block diagram we have used arduino mega 2560 board. Here all the interfacing are done using this board. We have connected barcode scanner to the board which scans data and give it to the arduino. We have also used an LCD which displays scanned data on it and also the total costing here we have used two switches one for if in case canceling any item and the other to indicate that the shopping is done and it sends total costing to pc through Bluetooth. We have GSM which sends total cost to customer’s handset. We have a door on our trolley which is controlled by the dc motor.

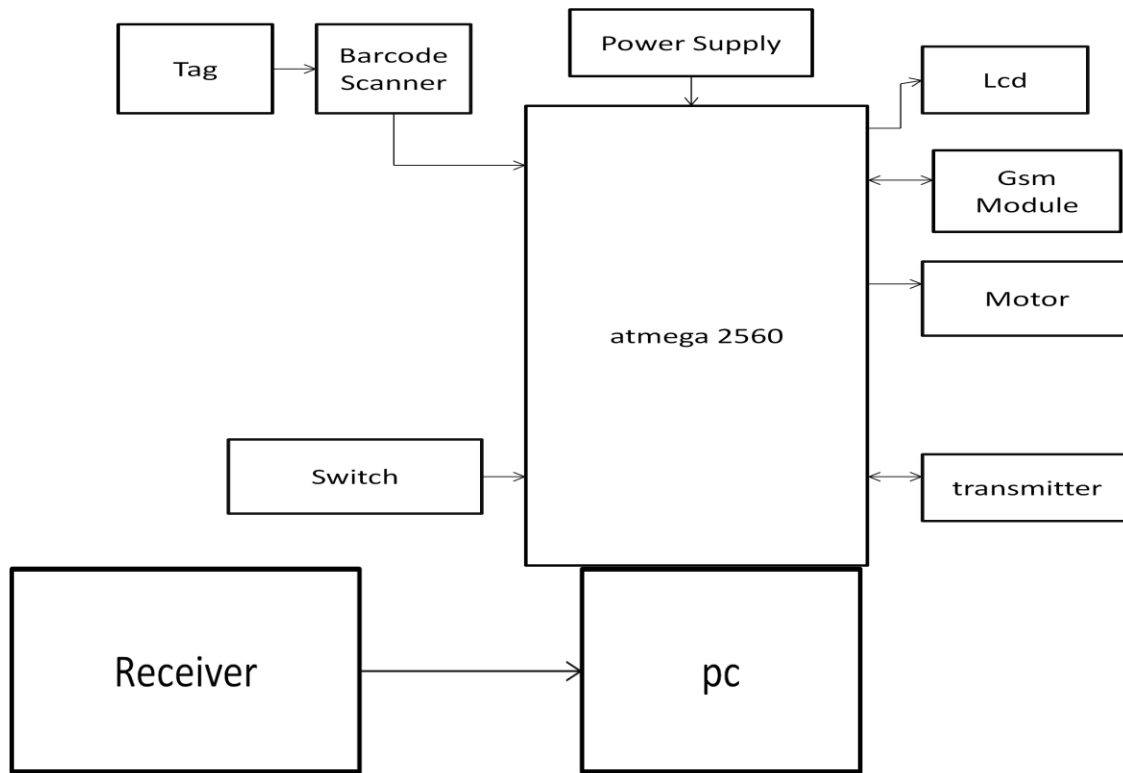
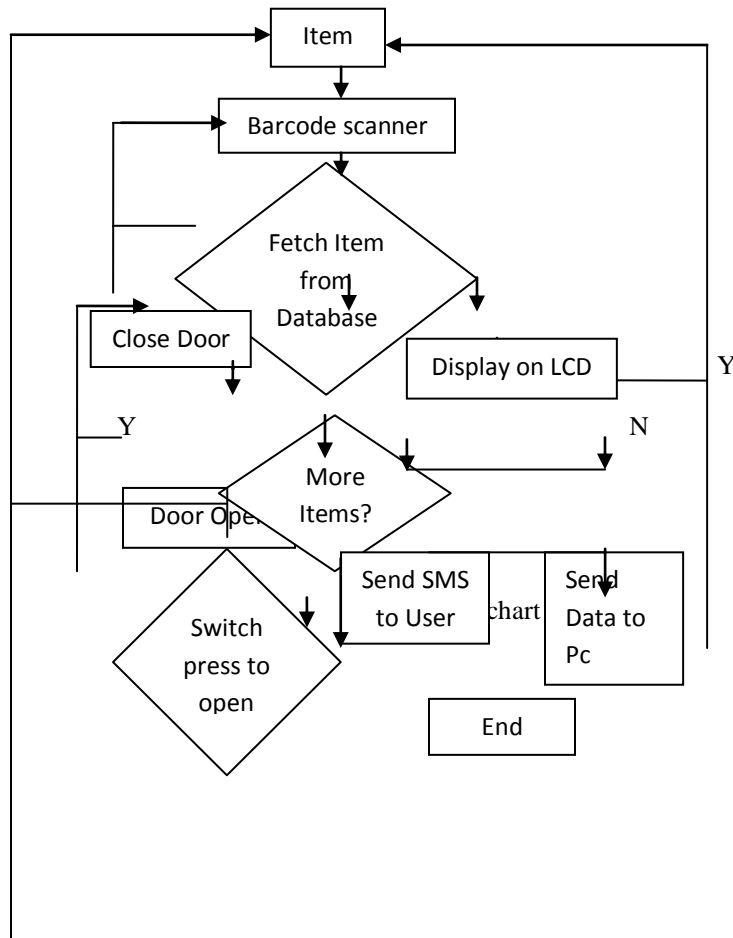


Fig.1 (a) Transmission side

Fig.1 (b) Reception side

1. Microcontroller: we have used the arduino Mega 2560. It is a microcontroller board based on the ATmega2560. It has 54 digital input/output pins (of which 15 can be used as PWM outputs), 16 analog inputs, 4 UARTs (hardware serial ports), a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. Arduino is interfaced with barcode scanner, switch, GSM, motor, LCD and transreceiver
2. Barcode Reader: It is a low cost, mid-range, imager, Reads from contact up to 125mm.It reads all commonly used barcode symbolologies.
3. LCD: 16*2 LCD is used. It can display 16 characters per line and there are 2 such lines
4. Switch: A simple button switch is interfaced with the microcontroller
5. Motor: a dc motor o 100 torque
6. GSM: SIM 900 is used. This modem is being able to operate in 850, 900, 1800, 1900 MHz bands
7. Transreceiver: here we have used HC-05 Bluetooth module as transreceiver.

2.3 Flowchart:



2.4 System flow:

1. All the items in the mall will be equipped with barcode tags. When person scans an item, its code will be detected by barcode reader which is interfaced with controller. After receiving the tag code it gives interrupt to the controller.
2. Reader send this code to controller, after matching code with codes stored in memory, controller reads item's name, cost & other details. Then it displays on LCD. The item details like name, cost & total bill of items inserted in trolley are displayed on LCD.
3. When item is scanned the door opens up and it allows the customer to put items in trolley. After few milliseconds it gets close automatically.
4. As we put the items, the costs will get added to total. Thus the billing is done at the trolley itself. Simultaneously all details are displayed on LCD. And also if we want to remove some inserted item then we press the cancel switch and remove a particular item. That item's cost gets subtracted from total bill.
5. Another switch is used to indicate that purchasing is over and to proceed for the paying.
6. At the billing Counter the total bill data will be transferred to PC by Bluetooth transceiver interfaced with controller, it receives billing data & gives it to the PC. This data contains all details of purchased items with total bill of items. It shows name of every item, its corresponding cost and the total bill of all products.
8. The data send by transceiver contains all details of the items purchased i.e. name of the item, it's price etc.

10. once the customer completes his/her shopping the total billing cost is also sent on customers mobile so that they don't need to take care of the billing for any future use.

III. HARDWARE and SOFTWARE IMPLEMENTATION

3.1. Hardware Implementation:

Here we have interfaced LCD, Barcode Scanner, Bluetooth Module, Switch and GSM with Arduino board.

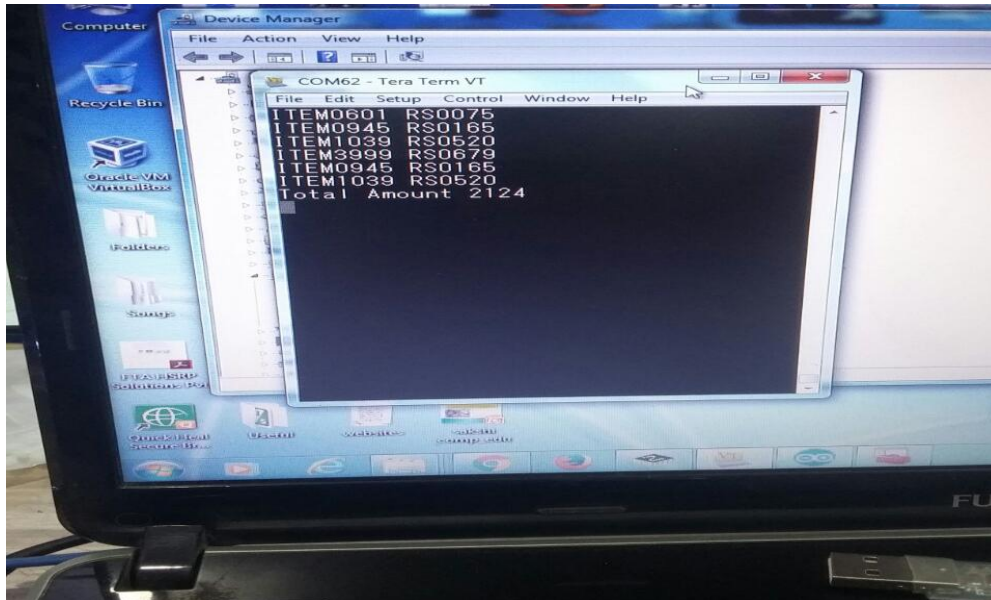


Fig.3 Total cost display in tera-term software

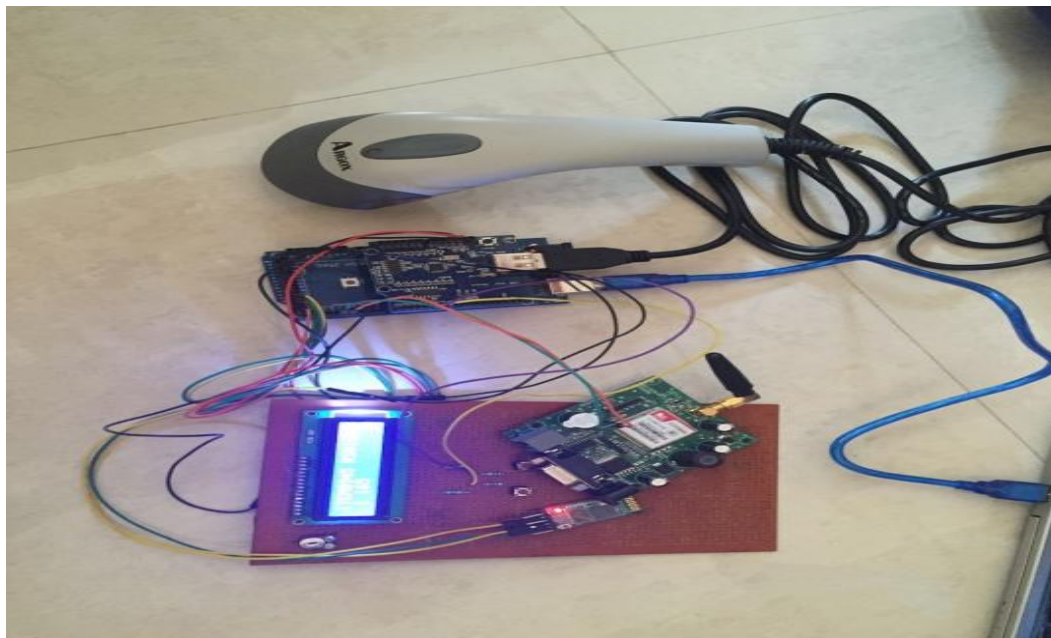


Fig.4 (a) barcode scanning

Fig.4 (b) hardware on trolley

3.2. Software Implementation

3.3.1 Arduino software:

A program or code written for Arduino is called a sketch. Arduino programs are written in C or C++. The Arduino IDE comes with a software library called “Wiring” from the original Wiring project, which makes many common input/output operations much easier.

3.3.2 Proteus software:

Proteus software is used for the graphical representation of circuit as well as simulation for the interfacing of electronic components.

Advantages:

- Time saving
- Easy to use
- no need to save bills
- low chance of miss management
- less crowd at billing counter

Applications:

The main application of this system is at shopping malls to reduce the billing time and enhancing the shopping experience.

Future scope:

1. With adding EDC on trolley we can also add payment system on trolley directly.
2. With certain modifications it can be used to track items in mall.

Conclusion:

Concluding this paper, we would like to highlight that we drew the inspiration and idea of this paper after observing large queues at the sales and billing counters at the Retail market. While working on this paper we learnt substantially arduino technology. This system would help in cost saving. It would reduce the required no of salesmen. Thus it is truly time saving method and guarantees the less time consumption out of all present billing methods.

Reference:

- I. Aniket Wani¹, Krutika Thakur², Nikhil Vaze³, Meeta Vadhel⁴, Prof. Rupali Advirkar⁵ Dept. of Electronics & Telecommunication KJSIEIT Mumbai, India
"RFID Based Intelligent Trolley System using Zigbee" published in: International Journal of Engineering and Computer Science ISSN: 2319-7242 Volume 4 Issue 3 March 2015, Page No. 10886-10889
- II. T.Shanmugapriyan PG Scholar-Master of Engineering in Pervasive Computing Technologies, Kings College of Engg., Punalkulam, India "Smart Cart to Recognize Objects Based on User Intention" published in: International Journal of Advanced Research in Computer and Communication Engineering Vol. 2, Issue 5, May 2013
- III. Ekta Maini, Jyoti Shettar DSCE,Bangalore, India "Wireless Intelligent Billing Trolley for Malls." Published in: International Journal of Scientific Engineering and Technology Volume No.3 Issue No.9, pp : 1175-1178
- IV. Satish Kamble, Sachin Meshram, Rahul Thokal, Roshan Gakre "Developing a Multitasking Shopping Trolley Based On RFID Technology" published in: International Journal of Soft Computing and Engineering (IJSCE) ISSN: 2231-2307, Volume-3, Issue-6, January 2014
- V. S. Sainath, K. Surender, V. Vikram Arvind Final Year, Department of Computer Science and Engineering Hindustan University Chennai, India J. Thangakumar, Ph.D. Assistant Professor, Department of Computer Science Hindustan University, Chennai," Automated Shopping Trolley for Super Market Billing System" India International Journal of Computer Applications (0975 – 8887) International Conference on Communication, Computing and Information Technology (ICCCMIT-2014)

Datasheets:

- [1] Atmega 2560 online available at
<http://www.alldatasheet.com/datasheet-pdf/pdf/107092/ATMEL/ATMEGA2560.html>
- [2] HC-05 online available at
http://www.robotshop.com/media/files/pdf/rb-ite-12-bluetooth_hc05.pdf
- [3] GSM online available at
<http://www.datasheetspdf.com/datasheet/SIM900.html>

Websites:

- [1] <https://www.youtube.com/watch?v=aw5Ijo3wGRA>
- [2] www.ijscce.org/attachments/File/v3i6/F2040013614.pdf.