

SMART TROLLEY SYSTEM

Kushagra Kashyap¹, Aashutosh Tiwari², Abhishek Chaturvedi³, Nishant Ranjan⁴, Priyadarshi Singh⁵,

Prof. Krutika Bang⁶

D.Y. Patil College of Engineering, Akurdi^{1,2,3,4,5}

Abstract: - The advent of wireless technology along with the other communication techniques help in making e-commerce very popular. 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 System. The main goal is to provide a technology oriented, low-cost, easily scalable, and rugged system for aiding shopping in person. The smart shopping trolley will help shorten the checkout lines thereby helping the customers at retail stores. The System consists of an RFID based trolley which communicates with the billing counter wirelessly using a ZigBee Transmitter (nrf24L01). Each trolley will consist of a similar type of hardware with unique trolley address. The developed system comprises of User Interface and Display Unit (UIDU) and Billing and Inventory Management Unit (BIMU). The customers will be able to scan the items themselves and the LCD screen on the shopping cart will keep updating the total. The billing counter can at any point of time inquire about the current items present in the trolley. This will turn out to be very beneficial for the retail stores as more people will enjoy the shopping experience and come more often to shop.

Keywords: - RFID, UIDU, Smart Trolley

I INTRODUCTION

Now a days interest in shopping malls is widely increasing among people. People get daily necessities from shopping malls. There is an emerging demand for easy and quick payment of bills in shopping malls. Shoppers are frustrated at locating the items on the shopping list when shopping in shopping malls and when no assistance is available in shopping. To eliminate these problems, each product in the shopping mall will be provided with a RFID tag, to identify its type. Each shopping cart is implemented with a Product Identification Device (PID) that contains a microcontroller, an LCD, RFID reader and a ZIGBEE transmitter. RFID reader will read the purchasing product information on the shopping cart and the information about the product is displayed on LCD which is interfaced to the microcontroller. At the billing counter, the total bill will be transferred to PC at the counter side by using ZIGBEE module.

In the proposed system, we are using the RFID reader at the trolley side and every product in the supermarket has its unique RFID tag with unique ID. Once the customer drops a certain product in the trolley, then the tag attached to that product was read by the RFID reader and sent to the controller. The controller counts the product value and displays its value on the LCD screen of the trolley. Like that we can add any number of products of our need and check the total bill on the LCD screen. After completion of the shopping, one should press the upload button at the trolley side to send the bill amount to the counter section over the ZIGBEE communication module. The bill amount was received by the ZIGBEE receiver and send to the PC to display in the Hyper Terminal.

II LITERATURE SURVEY

RFID and barcodes are similar in that they are both data collection technologies, which means they automate the process of data collection. However, they also differ significantly in many areas. If compared, RFID technology is found to be simpler than the barcode technology. Barcode scanner requires line of sight whereas RFID can be read without the line of sight. It is possible to scan RFID tags from a larger distance. An RFID reader can gain the information of the tag from a distance of about 300 feet, whereas barcode technology cannot be scanned from a distance of more than 15 feet. Barcode coded items can only be read individually whereas multiple tags can be read by RFID reader simultaneously.

RFID technology is better than barcode technology in terms of speed. RFID tags can be read much faster than the barcode tags. As it requires a direct line of sight, barcode reading is comparatively slower than the RFID tag reading. A barcode reader takes about one second to successfully interpret two tags, whereas in the same time the RFID reader can interpret around 40 tags. RFID tags are well protected and implanted inside the product, and thus they are not subjected to too many wears and tears. The barcode requires a direct line of sight to the printed barcode, because of which the barcode has to be printed on the outer side of product, thus subjected to huge amounts of wears and tears. It is also limited to re-utilization of the barcodes. As barcode lacks with the read and write facility, it is not possible to add to the information that is already existing on it. The main advantage of using the RFID tags is that rewriting on RFID tags is possible.

The utility of trolley will be first one of its kind for

AND ENGINEERING TRENDS

commercial use. This device records the data of different products with the help of the suitable sensors like RFID Tags. This recorded data helps the shop owner with the detailed analysis of shopping by the customer & their preferences through computer; printout of the same can be obtained. In Automatic trolley, there is no need to pull heavy trolley, wait in billing queue and thinking about budget. The microcontroller based trolley will automatically follow the customer. And also it maintains safe distance between the customer and itself. It gives number of products in trolley and the total cost of the products on the spot.

III PROPOSED WORK

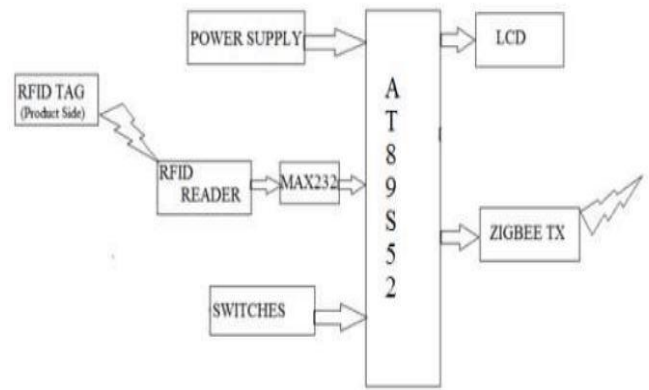
In the proposed system, we are using the RFID reader at the trolley side and every product in the supermarket has its unique RFID tag with unique ID. Once the customer drops a certain product in the trolley, then the tag attached to that product was read by the RFID reader and sent to the controller. The controller counts the product value and displays its value on the LCD screen of the trolley. Like that we can add any number of products of our need and check the total bill on the LCD screen. After completion of the shopping, one should press the upload button at the trolley side to send the bill amount to the counter section over the ZIGBEE communication module. The bill amount was received by the ZIGBEE receiver and send to the PC .In the beginning, when the kit is switched on by providing the power supply to the kit, the below images are seen which show “WELCOME “on the LCD screen of the device. When an RFID tag is scanned by the RFID reader, the images as shown below are displayed along with the details of the name of the product, weight of the product, cost of the product and the total billing amount,. After completion of the shopping, press the shopping completed button. The image as shown below is seen and the information is sent to the PC using ZIGBEE technology. The items with their individual costs and the total cost is displayed on the PC as shown in the below image.

Hardware Implementation of the Project

The design and working with the help of the block diagram. We explain the features, timer programming, serial communication, interrupts of 8051 microcontroller.

Block Diagram of the Project and its Description

The block diagram of the design is as shown in Figure. It consists of a power supply unit, microcontroller, Zigbee, RFID and MAX232 and LCD. The brief description of each unit is explained as follows.

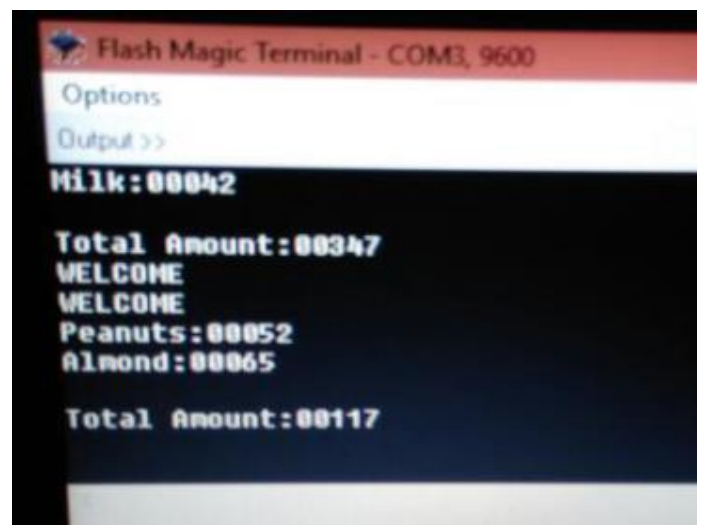


The output images can be seen as shown below.

1. In the beginning, when the kit is switched on by providing the power supply to the kit, the below images are seen which show “WELCOME” on the LCD screen of the device.



When an RFID tag is scanned by the RFID reader, the images as shown below are displayed along with the details of the name of the product, weight of the product, cost of the product and the total billing amount.



Output Terminal

ADVANTAGES

1. Easy to use and reduces man power.
2. Safe, secured and needs low power.
3. It is echo friendly; with this we can eliminate usage of paper.
4. It very attractive and eye catching.
5. Easy to shop
6. Easy to use
7. Flexible.

IV CONCLUSIONS

The intended objectives were successfully achieved in the prototype model developed. The developed product is easy to use, economical and does not require any special training. This project simplifies the billing process, makes it swift & DYP COE, AKURDI 45 Department of InfoTech

TE Seminar SMART TROLLEY SYSTEM increases the security using RFID technique. This will take the overall shopping experience to a different level.

REFERENCES

- [1] Morris, T. H., Thornton, Z., & Turnipseed, I. 1] www.schneiderelectric.com.hk/resources/access/text/rfidreader
- [2] <http://archive.computerhistory.org/resources/accessOral> History Panel, retrieved 2011 June 28 page 4
- [3] Microchip PIC16C84, a reprogrammable EEPROM-based 8-bit microcontroller 1993
- [4] 8052 microcontrollers: an applications-based introduction
- [5] BBC, (2003), Supermarket Tries Out Smart Tagging, BBC News, www.bbc.co.uk, 16 January
- [6] www.schneiderelectric.com.hk/.../Sympholux_Shopping_Ma
- [7] RFID JOURNAL, 2002-2007, REFFERD 6.8.2007, <http://www.rfidjournal.com>
- [8] <http://www.vbtutor.net/vb6/vbtutor.html> visual basic6 tutorial