

“A New Technology of Smart Shopping Cart using RFID and ZIGBEE”

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Abstract—Now a days it is common to see people getting enthusiast in online shopping through e-commerce websites but still the shopping centers are popular. We come across many types of carts used for shopping in malls and shopping centers. We are proposing smart shopping cart which uses the RFID and ZIGBEE technology to identify the products details and sends the data wirelessly to the receiver. We propose to have facility to browse the available products list on-screen in the display connected to the microcontroller which is situated in smart cart. The cart is interacting with the Main Server and it will have the facility to generate the bill for all the products added into the cart. The proposed system will be helpful for avoiding queues in shopping malls for billing. With the proposed design conventional queue system for billing generation and hence the shopping becomes easy and enjoyable.

Keywords— IR Sensor; ZIGBEE; RFID Reader; RFID Tags; smart cart.

I. INTRODUCTION

Frequently, people encounter a problem of spending too much of their time waiting in queues for billing their purchases in different shopping centers or supermarkets. Waiting in-queues negatively affects human morale and may cause misunderstandings or conflict amongst people, for instance, when someone breaks the line and stands in front of other people. The proposed project aims to eliminate this problem by introducing a novel alternative to traditional billing methods, speeding up the payment process.

A. Generic Approaches (Present Status)

AVR Microcontroller was developed in the year 1996 by Atmel Corporation. This is highly specialized field that has the power of integrating thousands of transistors on single silicon chip. Nowadays, in mall for purchasing variety of items it requires trolley. Every time customer has to pull the trolley from rack to rack for collecting items and at the same time customer has to do calculation of those items and need to compare it with his budget in pocket. After this procedure, customer has to wait in queue for billing. So, to avoid headache like -Pulling trolley, waiting in billing queue, thinking about budget. We are introducing new concept that is “A New Technology of Smart Shopping Cart Using RFID and ZIGBEE.”

C. Smart Cart Description

The smart card uses a serial interface and receives its power from sources like a card reader. a smart card is like a chip card. It is a plastic card that contains an embedded computer chip-either a memory or microcontroller type that store and transacts data. This data usually associated either value, processed within the card's chip. The card data is transacted via a reader that is part of computing

system. In the proposed model, the smart card provides a predefined code and balance amounts. Every card has some unique code store in its EEPROM also known as firmware, which is an integrated programmed with specific data when it is manufactured.

D. Smart shopping Cart

The smart shopping systems usually require other auxiliary wireless communication systems but the proposed system we are using called as ZIGBEE wireless communication.(especially low-cost) to perform indoor positioning and product information broadcasting Thus, the dual-antenna RFID reader is adopted in the developed SSC to identify the items in the cart (internal antenna) and out of the cart (external antenna).

A customer when purchases item after swiping card the prize and number of item are read by the RFID reader and the number of items purchased are already entered in to the cart before reaching up to the counter. There will be elimination of queue.

E. Elimination

Another important technology used in Smart Cart system is called ZIGBEE wireless communication, which is one measure to reduce the waiting time of customer's is to introduce an intelligent billing system using electronic Smart Cart as an alternative to existing barcode system. Smart cart shown in Fig. allows a customer to manually perform billing without relying on cashier by means of swiping the RFID tags over RFID reader. Unlike barcode system, smart cart does not need any visual contact with barcodes which may get distorted in real life situations. All data about purchased products and user account data are stored in a cloud database in the Internet. Then, smart cart shows this information to customers on its display. A customer can delete an item from the list whenever he or she wishes. If the customer decides to finish purchasing, just a single

button press is required to upload all purchased product data and their total cost to cloud database. Once all payment data is uploaded to the web, total cost is withdrawn from the registered account cash of the customer. All purchased products are deleted from the cloud database and the customer can freely pass the anti-theft gate with the purchased products.

II.LITERATURE SURVEY

During survey we found that most of the people avoid of waiting in long queues to buy a few products actually they leave shopping mall. People find it difficult to locate the product they wanted to buy, after selecting product they need to stand in a long queue for billing and payment. To overcome the problems which are identified, recent years have seen the appearance of several technological solutions for hypermarket assistance. All such solutions share the same objectives: save consumer’s time and money, help the retailers to win loyal clients.

One system is designed i.e. the Web shopping cart system as a typical client-server application on the Web. Then they clarified several problems on the implementation of the Web shopping cart system, which are peculiar to the Web. In order to solve the problems, proposed a new mechanism that can manage user sessions with high reliability and safety. It is compared the Web shopping cart system implemented using the proposed mechanism with the one developed by the conventional methods.

One more system is proposed, an automatic embedded software generation framework that can create and evolve ZIGBEE applications. The framework consists of two major modules, pattern extraction and code generation. Pattern extraction and development are designed to provide ZIGBEE application with model reuse and modification. SysML serves as a medium between pattern development and code generation. A smart shopping cart application has been implemented using this pattern based software framework.

Mr. P. Chandrasekhar Assistant Proffessor[1], proposed the concept of RFID Reader is stand by Radio-frequency identification .It is use of radio wave to read and capture information store on a tag attached to micro-controller. When the shopper drops any product s in the card then the RFID Reader reads the tag .Shopping trolley is equipped with proposed model with RFID Reader on front panel .An RFID tag is attached to each product in shopping center. After selecting a product , person has to drop the product in trolley. When the product is dropped the RFID Reader scan the RFID tag on product without requirement of line of sight communication

Galande Jayshree et al. [2], proposed a system as Automatic Billing Trolley based on RFID technology. In this system shopper will have the details about price of every item that are scanned and total price of the items. This system will save time of customers and reduces the employees required in the mall. BAR code technology is replaced by fixing RFID tags to the products and a RFID reader with a LCD in the shopping trolley.

2. Microcontroller

Ms .T. Sangeetha [3] It proposed the concept of a single on chip computer which includes number of peripherals like RAM, EEPROM, Timers etc. required to perform some predefined task.

AVR Microcontroller :- It was developed in the year 1996 by Atmel corporation .The architecture of AVR was developed by Alf-Egil Bogen and Vegard Wollan.

3. LCD Display

J.S.Awati1, S.B.Awati2[4] Proposed the concept of LCD display used here is 16*2 LCD(Liquid Crystal Display);this means 16 characters per line by 2 lines .A very popular standard exists which allows us to communicate with the vast majority of LCDs regardless of their manufacturer .The standard is referred to as HD44780U,which refers to the controller chip which receives data from an external source and communicates directly with the LCD .The 44780 standard requires 3 control lines as well as either 4 or 8 I/O lines for the data bus .Here we are using 8-bit mode of LCD , i.e using 8-bit data bus.

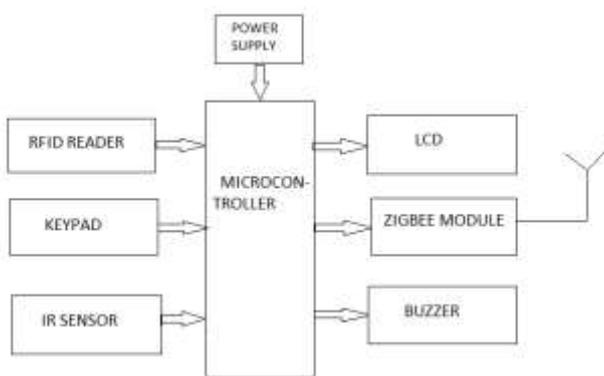


Fig.1.Transmitter



Fig.3. LCD display as Rs.1 and Total Price



Fig.4. LCD display as warning remove product



Fig.2.Receiver

1. RFID Reader

4. ZIGBEE

Chihhsiong Shih, Bwo-Cheng Liang, Cheng-Zu Lin [5] proposed the concept of ZIGBEE

application design pattern ,automatic code generation, and architecture model mapping ,to aim at required tools for automated layout of ZIGBEE embedded software. ZIGBEE application normally interfaces with different peripheral devices such as sensors and controllers. A ZIGBEE Reader node and a master Reader node responsible for communication to the location server.



Fig.5. ZIGBEE (Internal)



Fig.6.ZIGBEE(External)

5. IR SENSOR

According to Tarun Agarwal, [8] the concept of infrared sensor circuit is one of the basic a popular sensor module in an electronic device this sensor is analogous to human's visionary senses, which can be used to detect obstacles and it is one of the common application in real time .The frequency range of infrared is higher than microwave and lesser than visible light. Some important specifications of infrared receivers are detectivity and noise equivalent power.

IR Sensor can detect the motion and measure the heat of an object. It is popular sensor module in an electronic device which can be used to common applications in real time and detect obstacles. It is use in various sensor based project and measure the temperature.

III. CONCLUSION

This new technology develops a smart shopping cart which can be applied for supermarkets and malls. The user interface provides whole information to promote the shopping service for customers. During purchasing if the extra item is inserted then by pressing the return key customer can put it back. After finishing the shopping it is necessary to press the button then the detail information is transferred through the ZIGBEE towards the billing system. In addition, the billing facility can avoid queue in the check-out process so that the

better shopping experience for customers can be created. If without swiping the card, the item enters in the trolley by unknown person or by mistake then immediately the buzzer works. Further extension of this pattern can be done for other ZIGBEE applications such as patient localization in a hospital environment, item retrieval in large scale storage ware house, and green energy applications.

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