

RFID Based Astute Clientage Curricle

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ABSTRACT: Shopping is an inspired routine of every individual's leisure. Our project is to make the shopping more easy and interactive process. The shopper has to membership himself to any shopping malls where each member is given an RFID card. The shopper can login his account of the mall's database and enter the shopping list. The employees of the mall shall process our lists on basis of the item availability, shop number etc. Once the customer enters the mall and takes a shopping cart; he has to use his RFID card to access the cart. The display in the cart shall give the route details and the items details as served the mall. Whenever an item is dropped into the cart, the RF tag in the item taken shall be read automatically by the reader in the cart and gets billed in the customer's account. By the end of the purchase, the grand total of all the items taken shall be checked and delivered. The cart is again put back to position for the other users.

Keywords: Smart cart, intelligent shopping cart

1 INTRODUCTION

RFID technology offers the ability to provide many new services and conveniences in the retail environment. Smart shopping cart with electronic displays, in communication with a retail computer system, can display a map associated with a shopping list downloaded by a shopper to identify a route to obtain the desired items. The smart cart, also equipped with RFID tags, can also verify the purchase of the items as they are placed in the cart and, if desired, communicate with a billing system to communicate with a billing system to automatically bill the shopper for the purchases. RFID technology begins to become more ubiquitous. In general, these concepts can be described in the context of guided shopping experiences for consumers, enhanced by the information flow enabled with RFID technology and other electronic systems. RFID reader and LCD monitor attached to provide guidance on location of products on store, information about individuals' products, and information about sale events on a real-time basis to consumers. A smart cart secures mobility of consumers and accelerates their purchasing.

1.1 EMBEDDED SYSTEMS

We are living in an embedded world. We are surrounded by many products and your daily life largely depends on proper functioning of these gadgets. Home automation uses wired- and wireless-networking that can be used to control lights, climate, security, audio/visual, surveillance, etc., all of which use embedded devices for sensing and controlling. Embedded systems carry out a specific work for which they are designed.

2 PROPOSED SYSTEM

2.1 Flow Diagram

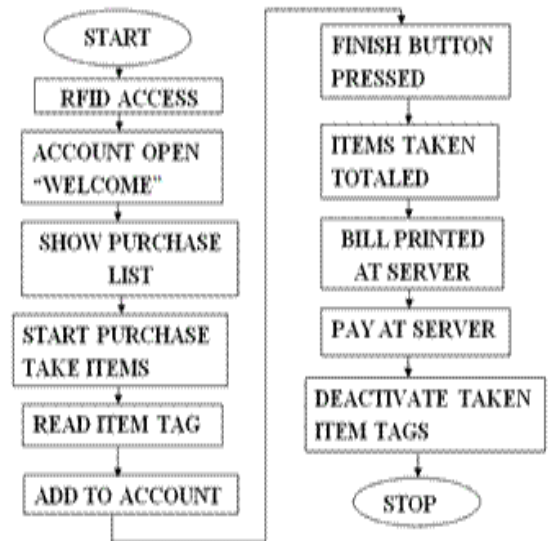


Figure1. Flow diagram

The above flow chart shows the entire algorithm of shopping. When the customer visits the mall, he take access over a cart with the RFID card that he has, his account opens and the purchase list along with the location & item details shall be displayed in the cart. As the user takes each item and drops into the cart, it is read by the RF reader in the cart for the RF tag in the item taken. The cost of the item taken is billed to the user's account and at the end of shopping; the user gets the grand total. After paying, the RF tags of the purchased item are deactivated thus, making easy the shopping process.

2.2 Block Diagram

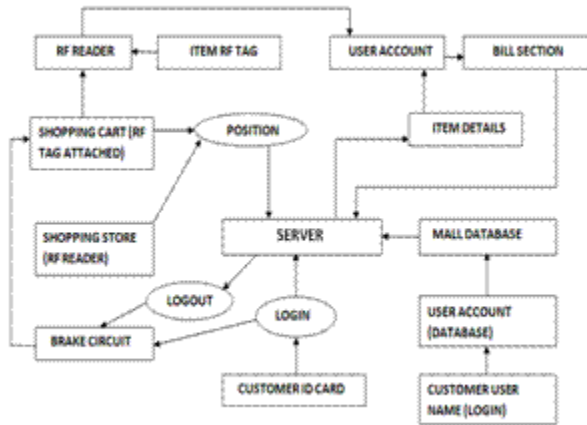


Figure2. Block diagram

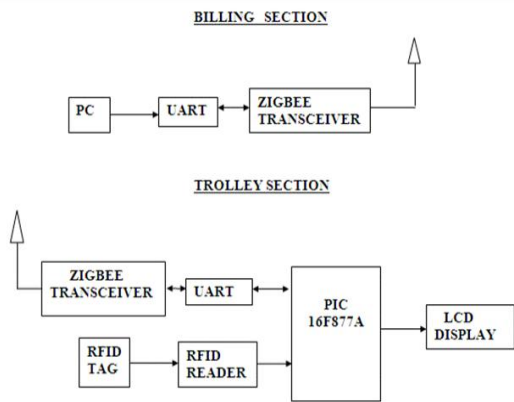


Fig.1 explains the process of shopping as proposed in our project has a server at the mall which manages the functions of the customers. The customers who register themselves at the mall shall be given with a RFID card and a login account. The user can login to the mall server and make entry of their purchase list. The employees of the mall shall process the data on aspects of item availability, shop number, shop name, floor number. When the customer visits the mall, he can gain access over a cart using his RFID card. The brakes of the cart release once it realizes an RFID card. The cart shall hold a display which shall access the processed purchase list from the server. The items as taken and dropped into the cart shall be read with a RF reader for the RF tag attached to every item. The cost of each item taken shall be billed to the customer's account and a grand total can be seen in the display.

2.3 Project Objectives

- To understand and study wireless system Radio Frequency (RF) in transmitting and receiving using RFID reader.
- To calculate the total value of the groceries buy.
- To work independently on a project starting from planning, designing and complete a project.
- To be familiar with troubleshooting a basic circuit.

2.4 Advantages

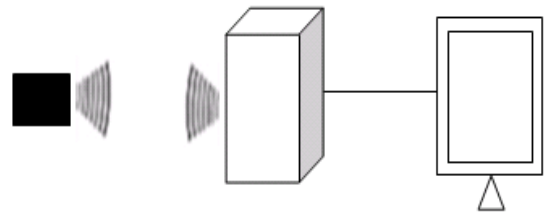
- Low power consumption
- It provides the easy access in the shopping.
- It reduces the shopping time.
- The total amount is calculated in the micro controller so we can avoid the man made error.

3 RFID SYSTEM

3.1 COMPONENTS OF RFID SYSTEM

A basic RFID system consists of three components: [8]

- An antenna or coil
- A transceiver (with decoder)
- A transponder (RF tag) electronically programmed with unique information



TRANSPONDER READER/ANTENNA SERVER

- The antenna emits radio signals to activate the tag and to read and write data to it.
- The reader emits radio waves in ranges of anywhere from one inch to 100 feet or more, depending upon its power output and the radio frequency used. When an RFID tag passes through the electromagnetic zone, it detects the reader's activation signal.
- The reader decodes the data encoded in the tag's integrated circuit (silicon chip) and the data is passed to the host computer for processing.
- The purpose of an RFID system is to enable data to be transmitted by a portable device, called a tag, which is read by an RFID reader and processed according to the needs of a particular application. The data transmitted by the tag may provide identification or location information, or specifics about the product tagged, such as price, color, date of purchase, etc.

3.2 TYPES OF RFID

RFID systems are typically classified according to the functionality[6]

1. **Passive Tags:** Such tags require no power source or battery within tags. The tag uses the energy of the radio wave to power its operation. This is the least expensive tag. Passive tag RFID systems are the prevalent types.
2. **Semi-passive tags:** Such tags rely on a battery built into the tag to achieve better performance. These batteries power the internal circuits of tags during communication.
3. **Active tags:** These systems use batteries for the entire operation, and can therefore generate radio waves even in the absence of an RFID reader.

4 EXPERIMENTAL RESULTS

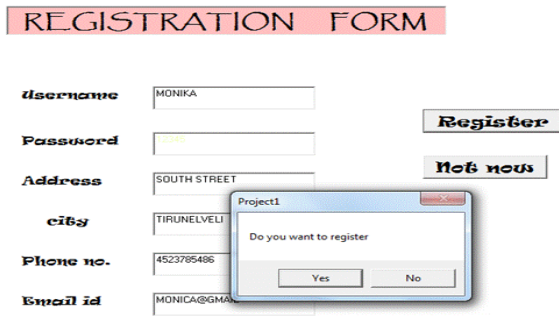


Figure 4. Registration form



Figure 5. Login form

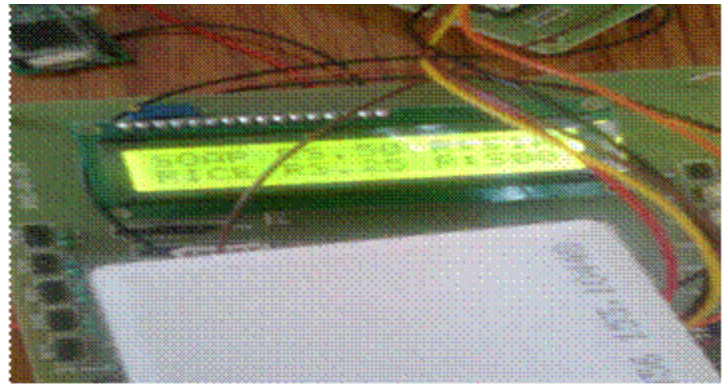


Figure 8. Selected items displayed in cart

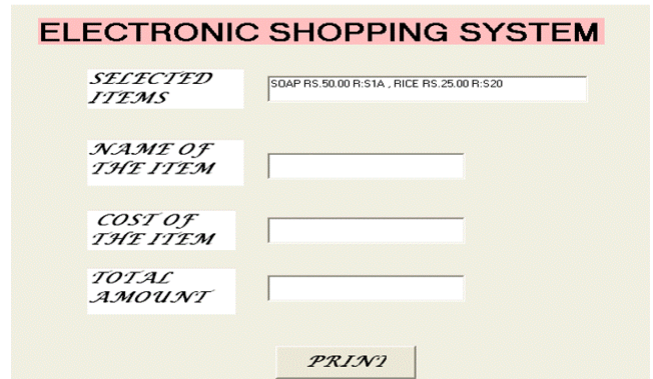


Figure 9. Selected items displayed in billing section



Figure 6. Selection of items



Figure 10. Details of rice displayed in cart



Figure 7. Confirmation of products

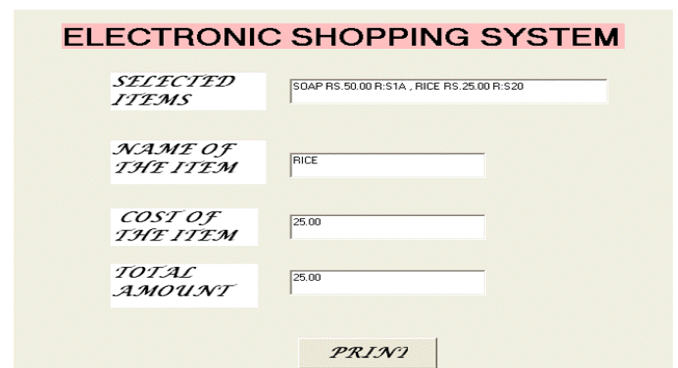


Figure 11. Details displayed in server



Figure12 . Details of soap and the total amount displayed

ELECTRONIC SHOPPING SYSTEM	
SELECTED ITEMS	SOAP RS. 50.00 R: S1A , RICE RS. 25.00 R: S20
NAME OF THE ITEM	SOAP
COST OF THE ITEM	50.00
TOTAL AMOUNT	75.00
PRINT	

Figure 13. Total amount displayed in the server

5 CONCLUSION

Finally we conclude that, the product was displayed on the LCD and the location of the product was also displayed. The total amount of the product was displayed and the grand amount was send to the billing. The wireless transmission of the grand amount was done using the Zigbee transceiver. In future our project can be extended by using the graphical display. And further, the trolley could be designed, in such-a-way that the items could be picked-up by itself.

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7 REFERENCES

- [1]. John B.Peatman,(2005)'Design with pic microcontroller',Pearson Edition,pp 206-214.
- [2]. Kenneth .J.Hintz, and Daniel Tabak,(2005)'Microcontrollers Architecture,Implementation and progamming'TATA MCGRAW HILL Edition,pp 427-445,478-490
- [3]. Rajkamal,(2005)'Microcontroller Architecture Programming interfacing and system design',Pearson Edition,pp 332-352.

- [4]. Steven Holzner,(1998)'Visual Basic 6.0 programming',Dreamtech Press,pp 421-425,839-848
- [5]. Wayne.S.Freeze'Visual Basic With ActiveX',Galgotia Publications Pvt Ltd.,pp 255-258
- [6]. Wireless Shopping Cart Using RFID Systems (Reference paper)
- [7]. www.ssecganesh.blogspot.in/2008/05/features-of-rfid.html
- [8]. www.made-in-china.com/showroom/vchip2010/product-detailYeTnuqhJYWVZ
- [9]. www.engineersgarage.com/electronic-components/16x2-lcd-module-datasheet
- [10]. www.engineersgarage.com/electroniccomponents
- [11]. <http://astronomyradio.blogspot.in/>
- [12]. www.lammertbies.nl/comm/cable/RS-232.html
- [13]. www.freebsd.org/doc/en/articles/serial-uart.html
- [14]. <http://radiosffrequency.blogspot.in/>
- [15]. Future Store Picking System Using RFID and USN technique (2009 IEEE) Predicting Missing Items in Shopping Cart (IEEE transactions on knowledge and data engineering, Vol. 21, No.7, July 2009).
- [16]. Sensing Anh-Tuan Do, Shoushun Chen, Zhi-Hui Kong, and Kiat Seng Yeo,' A High Speed Low Power CAM With a Parity Bit and Power-Gated ML ', IEEE Transaction January 2013.
- [17]. Yen-Jen Chang, Member, IEEE, Kun-Lin Tsai, Member, IEEE, and Hsiang-Jen Tsai,(IEEE 2013), 'Low Leakage TCAM For IP Lookup Using Two-Side Self-Gating', IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS—I: REGULAR PAPERS, VOL. 60, NO. 6, JUNE 2013.
- [18]. Scott Beamer, Mehmet Akgul, University of California, Berkeley,' Design of a Low Power Content Addressable Memory (CAM)' May 7, 2009.
- [19]. Pedro Reviriego, Salvatore Pontarelli, Juan Antonio Maestro, and Marco Ottavi (IEEE 2013),' Reducing the Cost of Implementing Error Correction Codes in Content Addressable Memories', IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS—II: EXPRESS BRIEFS, VOL. 60, NO. 7, JULY 2013