



No queue billing purchase system

M. Senthil Kumar¹, S. Kalaimathi², G. Karthik Rajan³, S. Kathiravan⁴, M. Kavipriya⁵

Assistant Professor, Dept of EEE, K.S.R College of Engineering, Namakkal, Tamil nadu, India¹.

UG students, Dept of EEE, K.S.R College of Engineering, Namakkal, Tamil nadu, India^{2,3,4,5}.

Abstract : Shopping is an activity in which a customer browser the available goods and services presented by one or more retailers with the intent to purchase a suitable selection of them. As the result, there will be huge rush in the shopping malls during weekend and holidays. People will purchase different items, soon after completion of purchase they have to wait in the billing counter for long time. As the Cashier has to scan each item individually which consumes more time for billing. Above problems can be rectified by using Arduino based smart cart shopping System which it consists of Arduino board, RFID reader, IR module, Zigbee module and Load cell were fixed in the cart itself. RFID reader is used to scan the RFID tags in each products. The IR module and Load cell are used to prevent the malpractice, which during scanning process the IR signal turned off with respective delay of time and simultaneously weight of the product is also measured by the load cell. If there is more weight in the cart when compared with total scanned products weight, then alarm arises via buzzer.

By using Zigbee, which connect and gather the information about purchased items from the main server during the shopping. Additionally, scanned items weight will be measured by using Load cell. Finally total price of purchase items will be displayed in cart itself. In this Billing performed automatically by gathering data from the server.

Keywords: Arduino, IR module, Load Cell, RFID, Zigbee module.

INTRODUCTION

Shopping has not only become as a fascinating one, but also turned as hobby for many people. As the result

there will be a huge rush in the shopping mall during the weekend and holidays. So the customers will waste more time by standing in queue near billing counter, as the cashier has to scan each and every product in the cart which will consume more time for billing. To rectify this problem we have designed 'SMART SHOPPING CART' here RFID reader is fixed in the cart itself so that when the customer place the selected product in the cart the information of the product is obtained by the RFID tag attached in the respective product when scanned while placing. The load cell gets the continuous feedback of the weight of the total selected product, if the weight rises than the selected products there will be an alarm via buzzer. The IR module is used to prevent the adding of an product without scanning, the IR gets turned off for some delay time when the signal is read by the RFID. Otherwise the IR will be enabled all the time if the customer try to add an product to the cart without scanning the IR gets interrupted and alarm rises. Finally the list of total products in the cart is transmitted to the billing counter via Zigbee module and automatic billing is performed, so the customer can pay the bill amount and make a time travel.

LITERATURE SURVEY

Ruinian Li in "IOT Applications on Secure Smart Shopping System"[1] proposed to develop a smart shopping trolley and Shelves using RFID and IOT. To check whether all the items in the cart has been scanned for secured shopping.

Zubin Thomas in “Automatic Billing System using Li-Fi Module”[2] proposed to develop a smart shopping experience for the customer by using li-fi transmitter in every product to scan them while placing in the trolley.

Saral Nigam in “IOT Based Intelligent Billboard Using Data Mining”[3] proposed to network of physical objects embedded with the sensors and network connection, software and mechanical components which provides these object to ability to collect exchange and process data through the Internet of Things.

J.C. Narayana Swamy in “Smart RFID based Interactive Kiosk Cart Using Wireless Sensor Node” proposed to built a smart interactive cart for scanning the products and locating the products in the super market.

EXISTING SYSTEM

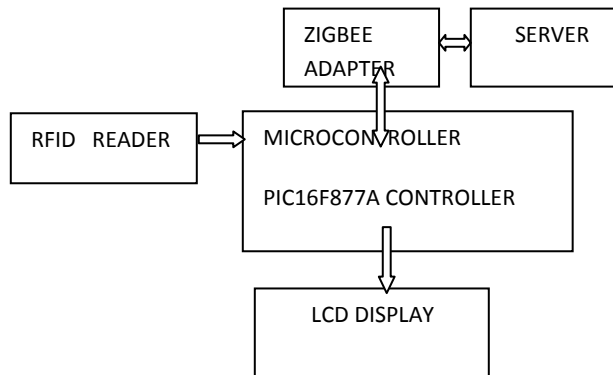


Fig 1. Block Diagram of Existing Model

The existing system performs the billing with RFID Reader which reads the RFID tag fixed in individual products. The RFID reader is fixed in the cart so that RFID tag fixed products is scanned while placing them in cart. The PIC controller is used to perform computation process and communicate to the central server via Zigbee adapter so the billing is performed instantaneously and automatically. And also displays the current selected product cost and total cost of purchased or selected products.

The main disadvantage of this method is there is no process for identification or indication of malpractice. The customer can even add an item to the cart without scanning or scan one product and place the other product in the cart. Essentially there must be a system

present for the identification of malpractice so this existing model is not much reliable.

PROPOSED SYSTEM

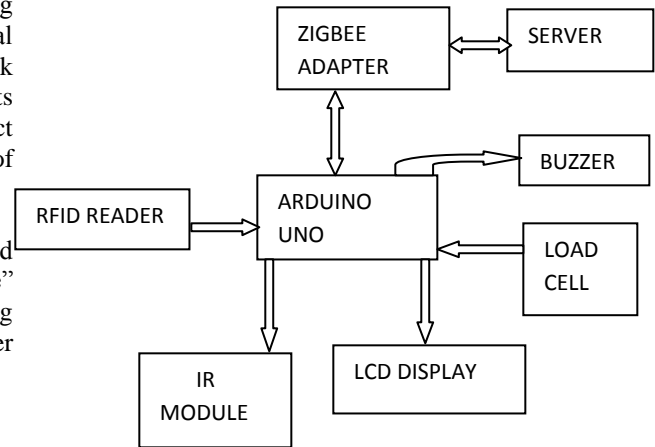


Fig 2. Block Diagram of Proposed Model

In the proposed system, the load cell is implemented to detect the malpractice. The load cell gives the feedback continuously to the arduino to verify the total loaded weight in cart with the actual weight of the scanned products. If the weight is verified with no mismatch the total cost of the selected products will be displayed in the LCD Display and updated to the server to perform billing, perhaps if the mismatch of weight is found the alarm arises in indication of adding of wrong or unscanned product.

In addition to that IR Module is provided in the cart. So when the product with certain weight which can be detected by the load cell is scanned by the RFID Reader then the IR Signal turns off for certain time period to place the selected product. If small weighted products for example like scale or pencil which can not be measured by the load cell then the IR signal will not turn off which can be placed in the reserved area in the cart for light weighted products. And also if the customer tries to add a product without scanning the alarm arises.

Adding or removing of a product is made reliable through this model, if the same scanned RFID Tag is read for the second time the product will be removed from the selected products list and weight after removal of the product is updated to the arduino and selected products list is also updated after removing of certain

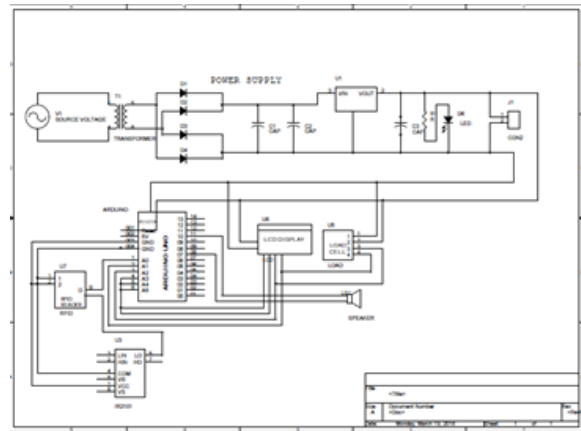
products for central automated billing. Arduino is used for better computational process.

SYSTEM MODEL

Objective :

- ✓ To reduce rush shopping at big malls during weekend and holidays, by developing a low cost intelligent shopping trolley.
- ✓ To avoid adding of products without scanning.
- ✓ To reduce queue for billing hence real customer satisfaction.

tag information and display the related results on the LCD Display. These steps are repeated till the customer finishes his shopping. The status of the product is also updated instantaneously. To perform automatic billing so eventually the customer need not to wait for scanning the products, they can pay the money and move on.



Smart Cart Server

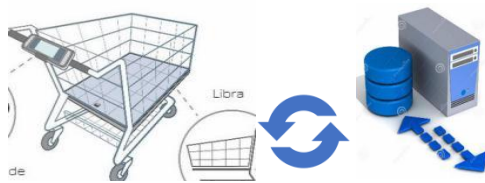


Fig 3. System Model

SYSTEM WORKING

When the customer enters the shopping mall, he/she will receive a trolley on which there will be a RFID Reader, LCD Display. The customer can use the smart trolley for shopping. Whenever the customer places the product into the trolley, the RFID Reader will read the

CONCLUSION

The Smart Shopping cart application creates an automated billing system for supermarkets and malls. Customers need not to wait for a long time near cash counters for their bill payment. Since their purchased product information is transferred to central billing system. Customers can pay their bill amount through credit/debit cards as well. The system product is highly dependable, authentic, trustworthy, and time-efficient. There will be reduction in theft. Also, the system is very time-efficient.

FUTURE SCOPE

The proposed smart shopping trolley system intends to assist shopping in-person which will minimize the considerable amount of time spent in shopping as well as to time required in locating the desired product with ease. The customer just needs to type the name of the product he wants to search, and the cart will automatically guide him/her to the products/locations.

REFERENCES

- [1] Ruinian Li, Tianyi Song, Nicholas Capurso, Jinguo Yu, Jason Couture and Xiuzhen Cheng- "IOT Applications on Secure Smart Shopping System" IEEE Internet of Things Journal (Published in Future Issue) 2017.
- [2] Zubin Thomas, Nikil Kumar and D. Jyothi Preshiya - "Automatic Billing System using Li-Fi Module" International Conference on Communication and Signal Processing, April 6-8, 2016.
- [3] Saral Nigam, Shikha Asthana, Punit Gupta - "IOT Based Intelligent Billboard Using Data Mining" International Conference on Innovation and Challenges in Cyber Security (ICICCS 2016), 2016.
- [4] Narayana Swamy J C, D Seshachalam, D Seshachalam - "Smart RFID based Interactive Kiosk Cart Using Wireless Sensor Node" International Conference on Computational Systems and Information Systems for Sustainable Solutions, 2016.
- [5] Komal Ambekar, Vinayak Dhole, Supriya Sharma, Tushar Wadekar - "Smart Shopping Trolley Using RFID" International Journal of Advanced Research in Computer Engineering and Technologies(IJARCET) Volume 4 Issue 10, October 2015.
- [6] Fathima Jabeen, Karishma R, Sindhu Adinarayana, Sudhir Rao ,Vaishnav Ram Savarni K R, Varsha G.Bhat, Vinay K Bharad Waj - "A Novel Video Processing Based Cost Effective Smart Trolley System for Supermarkets Using FPGA" International Conference on Communication, Information & Computing Technology(ICCICT) 16-17, January 2015.
- [7] Suryaprasad J, Praveen Kumar B, Roopa D Arjuin A K - "A Novel Low Cost Intelligent Shopping Cart" IEEE International Conference on Networked Embedded System for Enterprise applications, NESEA , December 8-9 ,2011.
- [8] Zeeshan Ali, Reena Sonkuare - "RFID Based Smart Shopping and Billing" International Journal of Advanced Research in Computer and Communication Engineering volume 2,Issue 12, December 2013.
- [9] Galande Jayshree, Rutuja Gholap, Preeti Yadav - "RFID Based Automatic Billing Trolley" International Journal of Emerging Technology and Advanced Engineering , Volume 4,Issue 8 March 2014.
- [10] Raajukumar, K Gopala Krishna, K Ramesha - "Intelligent Shopping Cart" International Journal of Engineering Science and Innovative Technology (IJESIT), Volume 2,Issue 4 July 2013.
- [11] Swatizope, Maruti Limkar - "RFID Based Bill Generation and Payment Through Mobile" International Journal of Computer Science and Network (IJCSN), Volume 1,Issue 3 June 2012.
- [12] Satish Kamble , Sachin Meshram , Rahul Chokal, Roshan Crakre - "Developing a Multitasking Shopping Trolley Based on RFID Technology" International Journal of Soft Computing and Engineering (IJSCE) ISSN:2231-2307, Volume 3,Issue 6 January 2014.
- [13] Awati J , Awati S -"Smart Trolley in Mega Mall" International Journal of Emerging Technology and Advanced Engineering , Volume 2,Issue 3 March 2012.
- [14] Chandrasekar P, Sangeetha M S T -"Smart Shopping Cart With Automatic Billing System Through RFID and Zigbee" International Journal of Emerging Technology and Advanced Engineering , 27-28 February 2014.
- [15] Kalyani Dawkhar, Shraddha Dhomase, Samraddhi Mahabaleshwarkar -"Electronic Shopping Cart for Effective Shopping Based on RFID" International Journal of Innovation Research in Electrical and Electronics, Instrumentation and Control Engineering , Volume 3,Issue 1 January 2015.