

# INTELLIGENT SHOPPING DEVICE WITH AUTOMATIC BILLING SYSTEM USING RFID

<sup>1</sup>Mrs.A.P.Rathkanthiwar, <sup>2</sup>Babli Umate <sup>3</sup>Shivani Pote, <sup>4</sup>Shalakha Baghel, <sup>5</sup>Sakshi Rahate

Associate Professor <sup>1</sup> Student<sup>2,3,4,5.</sup>

Electronics and Telecommunication Department<sup>1,2,3,4,5.</sup>

Priyadarshini College of Engineering, Nagpur, MH. India.

**Abstract :** *The most valuable thing in today's world is time, people are referring those things which consumes less time. Billing in Shopping mall takes lot of time. Billing of products from mall is quite difficult because it takes more time as people have to wait for a long time in a queue for billing. Looking at the advancement in technology, we came up with an innovative idea of Shopping Cart for Automatic Billing in Supermarket. This work consists of RFID reader, motion detector sensor, liquid crystal display, push buttons, switches. For using smart trolley functions, user has to press start button. When a user put some product in trolley then its code will be detected using RFID reader and cost of a product added to the list. In case, if user wants to remove some product then user has to press the remove switch . At last, counter with least number of queues will be detected and displayed on the cart LCD. The central billing system gets the cart information and EEPROM data, it access the product database and calculates the total amount of purchasing for that particular cart. Main aim of this paper is to provide an automatic billing to avoid queue in malls and super markets.*

**Index:-**Terms RFID, RFID Module, automatic billing, shopping trolley, sensors

## I. INTRODUCTION

In the modern world, every supermarket and hypermarkets employ shopping baskets and shopping trolleys in order to aid customers to select and store the products which they intend to purchase. The customers have to drop every product which they wish to purchase into the shopping cart and then proceed to checkout at the billing counter. The billing process is quite tedious and highly time consuming and has created the need for shops to employ more and more human resource in the billing section, and yet waiting time remains considerably high. In this paper, we seem it fit to propose the "Intelligent Shopping Cart/Trolley for Automatic Billing in Supermarket." which aims to reduce, and possibly eliminate the total waiting time of customers, lower the total manpower requirement and expenses for markets and increase efficiency overall. In a world where technology is replacing the ways we pursue everyday activity, the future of the retail industry also lies in more and more automated devices. The emergence of technologies such as radio frequency identification device (RFID) and wireless network makes the traditional retail processes faster, transparent and efficient. The technology represent to retails and opportunity to reduce costs and to improve services, allowing attaining clients quickly, precisely and supplying personalized services. The advances manufacturing, distribution and information combined with the urbanization of modern society and social demographical challenges created the so called new consumer. The consumer has a deeper understanding in comparing product costs ; is more versatile in brand preferences ; shows little loyalty to retailers has great expectations in services and client regard; is self sufficient and is more demanding towards supplied information. There was clear control transference from the manufacturers and retailers to the consumer. Strong competition between larger retail changes caused the minimization of profit margins as a form of keeping aggressive prices and winning more clients. Today, this is no longer enough. One has to bet on offer differentiation and in the adoption of client retention strategies through the strengthening of the relation with the consumer, allowing adequate answers to the clients' needs through personalize service and promotion plans that augment their satisfaction and, most importantly, their enthusiasm. RFID tag, or simply "tags", is small transponders that respond to queries from a reader by wirelessly transmitting a serial number or similar identifier. They are heavily used to track items in production environments and to label items in supermarkets. They are usually thought of as an advanced barcode. However, their possible area of use is much larger. Few new applications that are possible using RFID technology are locating lost items, tracking moving objects, and others. RFID tags are expected to proliferate into the billions over the next few years and yet, they are simply treated the the same way as barcodes without considering the impact that this advanced technology has on privacy. This paper presents possible exploits of RFID systems and some proposed solutions as well. RFID is the special type wireless card which has inbuilt the embedded chip along with loop antenna. The inbuilt embedded chip represents the 12 digit card number.

## 2. OBJECTIVE

The main objective of this work is to reduce and eliminate time taken in billing counter in super markets by designing an Intelligent Shopping Basket which uses RFID Reader to allow users to self-checkout and increase productivity time.

## 3. METHODOLOGY

The automated shopping cart system integrates a shopping cart (trolley) with RFID reader placed checkpoints. It facilitates the user to self-read the RFID cards of the purchased products which he/she intends to purchase.

A wireless smart-device makes note of all the scanned commodities of the particular trolley (with allotment number) ; and is linked with the supermarket's backend database which contains details of the products such as name of product, weight of the product, cost price, etc. The scanned products are automatically billed in the wireless smart device for their purchases, and transmitted to the shop's central billing program. This significantly reduces turnaround time. Also, by this mechanism, the time consuming work of scanning and billing every single product at the cash counter can be avoided.

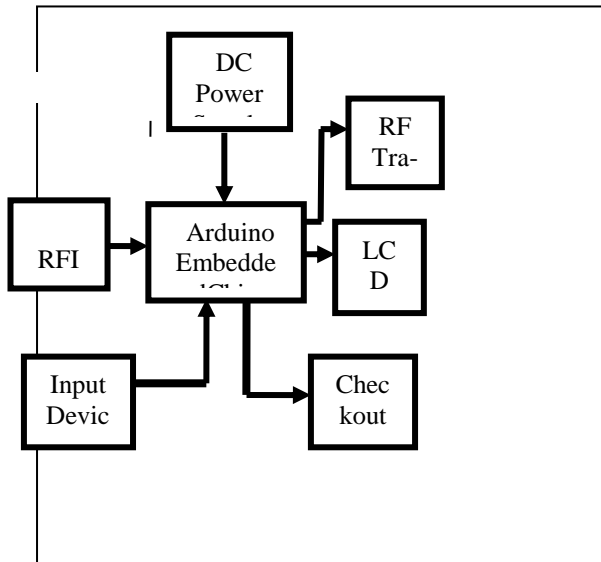
**4. BLOCK DIAGRAM:**

Figure :- 1. Transmitter section

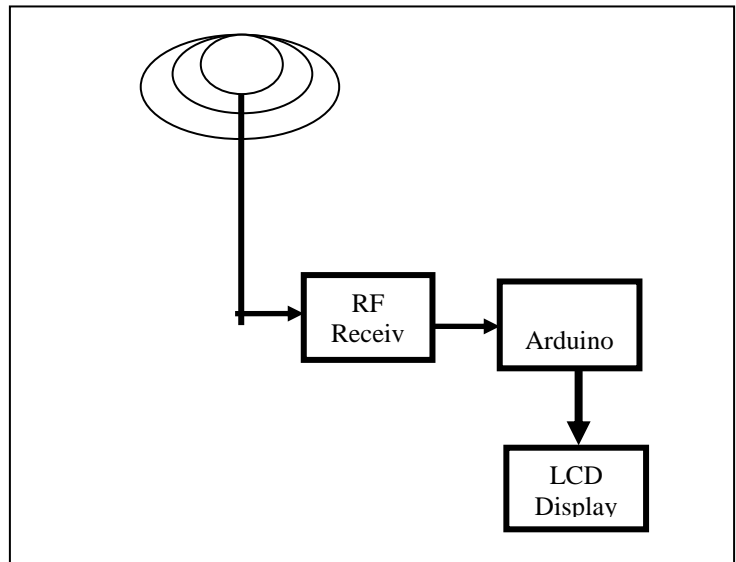


Figure :- 2. Receiver section

**5. Working of Model**

When the customer purchase a product, she/he first scans the RF tag of the product using the RFID reader and then places it into the trolley. While the customer is scanning the RF tag of the product, a price of the product is taken and stored in the system's memory. Information stored in system's memory, then cost, name of respective product gets displayed on the LCD. Counting is mainly done for security purpose. If in case while wandering round the mall someone removes the RFID tag and puts the product in trolley then counting the no of items helps to get information of items purchased. Thus counting is done but there is no addition of cost respective product in bill. This shows the increase in number of products but not increase in bill. After completion of shopping, a key is pressed indicating final billing of all the products. Thus the final information of all products is transmitted to a computer with the help of serial communication & the final billing is done by VB software on computer. There is a barcode system in our project. It is impossible to stick the RFID tag to some product like coconut, vegetables etc. Hence in such cases conventional scanning of barcode is more sophisticated than RFID technique. Much like tuning in to the favorite radio station, RFID tags and readers must be tuned into the same frequency to enable communications. RFID systems can use a variety of frequencies to communicate, but because radio waves work and act differently at different frequencies, a frequency for a specific RFID system is often dependent on its application. High frequency RFID systems (850 MHz to 950 MHz and 2.3 GHz to 2.5 GHz) offer transmission ranges of more than 90 feet, although wavelengths in the 2.3 GHz range are absorbed by water, which includes the human body and therefore has limitations.

**6. SOFTWARE USED**

- ARDUINO 1.6.9

**7. ADVANTAGES**

- Reduces manpower required in billing section. This can reduce the expenses incurred by the management.
- Users can be aware of the total bill amount during the time of purchase.
- Reduces time spent at billing counter and Increases customer satisfaction.

**8. DISADVANTAGES**

- Requires constant battery backup. This requires constant care as customers tend to get upset when they find their trolley runs out of power during the middle of their shopping routine.

**9. RESULTS**

When the customer enters the mall they will receives the trolley. The trolley is embedded with the system of RFID reader. when the customer wants to purchase a product they will show that product in front of RFID reader, the products has attached RFID card, the LCD display will shows the information of that product i.e. the name, weight and price of that product. when customer wants to finish purchasing they will press the checkout button. the same information will be displayed on the receiver side. Then the Customer will take the receipt. and hence there will be elimination of queue.

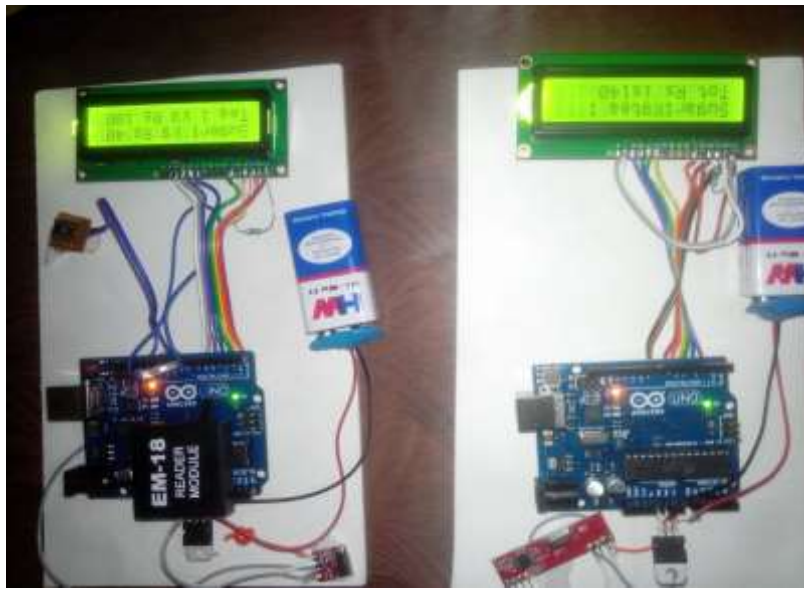


Figure: 3 Final Output

**10. FUTURE SCOPE:**

1. Unwanted products can be removed .
2. Customers can do billing itself.
3. To overcome the battery problem we can use low power consumption of RF module

**11. CONCLUSION**

Taking into account the changing trend in retail shopping, we came to a conclusion that the Intelligent Shopping Basket is most certainly a definite necessity for the retail marketing industry to step up their portfolios, cope up with the advancement in technology and save time and manpower.

**12. REFERENCES:**

- [1] Ankit Anil Agarwal, Saurabh Kumar Sultania, Gourav Jaiswal and Prateek Jain on “RFID Based Automatic Shopping Cart” in Control Theory and Informatics ; ISSN 2224-5774 (print) ISSN 2225-0492 (online), Vol 1, No.1, 2011
- [2] H. Karl and A. Willig, “Protocols and Architectures for Wireless Sensor Networks,” Chichester, England, 2005.
- [3] J.Awati and S.Awati, “Smart Trolley in Mega Mall,” in International Journal of Emerging Technology and Advanced Engineering Website: www.ijetae.com (ISSN 2250-2459, Volume 2, Issue 3, March 2012)
- [4] Satish Kamble, Sachin Meshram, Rahul Thokal, Roshan Gakre on “Developing a Multitasking Shopping Trolley Based On RFID Technology” in International Journal of Soft Computing and Engineering (IJSCE) ISSN: 22312307, Volume-3, Issue-6, January 2014
- [5] Raju Kumar, K. Gopalakrishna, K. Ramesha on “Intelligent Shopping Cart” in International Journal of Engineering Science and Innovative Technology (IJESIT) Volume 2, Issue 4, July 2013