IOT Based Intelligent Trolley for Shopping Mall

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Abstract - **Now a day's shopping at big malls is a daily activity in metro cities. One can see huge rush at malls on holidays and on special discounts days. People purchase different items and put them in trolley & go to billing counter for payments. At the billing counter the cashier prepare the bill using bar code reader. Aim of this task is to develop a system that can be used solve the above mentioned challenge. The system with RFID tags will be placed in all the trolleys. All the products in the mall will be equipped with RFID tags. When a person puts any products in the trolley, its code will be detected and the price of those products will be stored in memory, its name and cost will be displayed on LCD and will be sent to billing Counter by wireless modules. Also this whole information will be send through Ethernet module to internet. Also we use ESP method which is helpful to owner.**

Keywords-**Shopping malls, RFID tag, RFID reader, ESP module, LCD display, IOT, ESP, Trolley.**

Abbreviations-
LCD: Liquid Crystal Diode
ARM: Advanced risk machine
RFID: Radio frequency identification

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I. INTRODUCTION

Shopping mall is a place where people get their daily necessities ranging from food products, clothing, electrical appliances etc. Sometimes customers have problems regarding the incomplete information about the product on sale and waste of unnecessary time at the billing counters. Continuous improvement is required in the traditional billing system to improve the quality of shopping experience to the customers [3].Now day's numbers of large as well as small shopping malls has increased throughout the global due to increasing public demand & spending. At the time of festivals, special discounts, holidays, etc. there is a huge rush in shopping malls. The use barcode reading technique in such situations always results in waste time since customer has to wait till whole items get scanned. These advantages can be avoided by using IOT based intelligent trolley proposed in this paper [1]. This system uses RFID technique instead of barcode. Proposed system uses separate RFID reader for each trolley and RFID Tag for each product. When customer buys any product RFID reader reads the tag which is present on the product. The cost of product and the total bill of shopping items can be displayed on 16*2 LCD.

IOT based intelligent trolley presented here is easy to use and does not requires the special training to customers. RFID technique has many advantages over barcode systems. RFID reader reads the tag from a distance of 300 feet whereas barcode can read the information at distance not greater than 15 feet. Also the barcode need one site of propagation. Reading frequency of barcode reads is only two tags whereas reading frequency of RFID is 40 tags [5]. So the use of RFID is more useful than traditional barcode reading technique. Here use of RFID is helpful for customer. Then what about owner? As each one of us is aware that single owner can have ownership of more than 2or3 malls or in each mall many sections are available, then how someone make control over it. Solution to above mentioned challenge is the use of ESP module. It will reduce the required hardware and also gives the real time information about commercial activity in all malls from any location.

Using this system, customer will have the information about price of every item that are scanned in, total price of the item and also brief about the product. So use of this IOT based intelligent trolley for shopping malls is helpful for customer as well as owners [6].

II. PROBLEM STATEMENT

At the time of festival or special offers there is huge rush in mall. Customers waste their lots of time at the billing counter. To overcome this disadvantage the technique develop is based on RFID. In IOT based trolley for shopping mall customer done automatic billing. And this is helpful for economic and efficient shopping. Also by using the concept of IOT this technique is helpful to owner also. Owner can observe real time business done in shopping mall from any place.
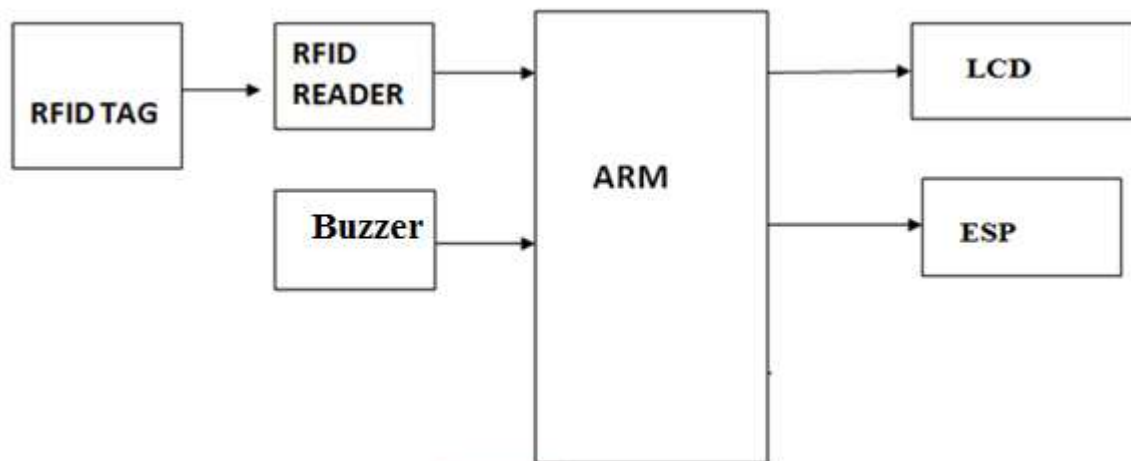
III. PROPOSED BLOCK DIAGRAM

Fig 1: Block diagram of Transmitter of IOT based intelligent trolley for shopping mall
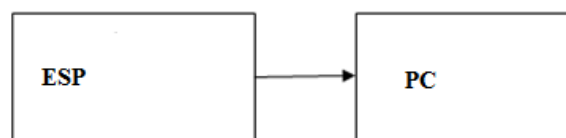

Fig 2: Block diagram of Receiver of IOT based intelligent trolley for shopping mall

IV. OPERATION OF WORKING

This IOT based Trolley has following applications:

1) Automatic billing at shopping mall 2) Helps to owners.

It has two sections transmitter section and receiver sections. First initialize the power of kit then it is ready to use for customer. If customer wants to purchase any product then he/she has to put the product in the trolley. As soon as the product falls in the trolley the RFID reader read the RFID Tag place on the product. This RFID reader is connected to the microprocessor. Microprocessor crosschecks the information get from RFID reader and information in the memory of microprocessor. If the information get match then the cost of product, name of product and the total bill display on the LCD. If user wants to remove any product then he/she simply remove that product from the trolley then LCD again display the name of product, cost of product and the total bill.

Trolley is provided with ESP which has same functions as ZIGBEE and ETHERNET. ESP transfer the information to the main server which is in the range. This main server has its own cloud from that owner can access the information from anywhere and anytime with the help of user ID and password. This is the concept of Internet of thing (IOT).

IV. ADVANTAGES

1.Does not need any special training.

2. Customer can get throughout information at the time of shopping.

3.Can guess exact amount at the time of shopping.

4. Save time

5.More efficient because use of RFID

6.Reduce rush at billing counter.

7.Freeing staffs from repetitive checkout scanning

VI. APPLICATIONS
1) Shopping mall
It is use in shopping mall for automatic billing.
2) Use as common observatory system for owner as he/she can observe billing of all mall from anywhere.

VII. CONCLUSION
The use of LCD in this trolley make it user friendly. LCD display the name of product, cost of product and total bill. Automatic billing is done in trolley so it save the time of customer and reduce the rush at billing counter. It also reduce the man power. Because of the use of IOT it will also helpful to owner.

References
[1]. EktaMaini, JyotiSheltar, "Wireless Intelligent Billing Trolley for malls",International Journal of Scientific Engineering &Technology volume No.3 Issue No. 9, 1175-1178. 1 sept 2014.
[2]. SatishKambale, "Developing a multitasking shopping Trolley Based on RFID Technology", IJSCE ISSN: 2231-2307, volume-3, Issu-6, January 2014. pp: 179-183.
[3]. VaditaGangwal, "Smart Shopping cart For Automated Billing using Wireless sensor N/W", International Institute Of informational Technology. pp:168-172.
[4]. Vinutha M.L,"Shopping and automated using RFID Technology", International Journal of electronics and communication engineering and technology ,volume No.5, Issue 8, August (2014), pp: 132-138.
[5]. HirenJethava,"Electronic shopping cart facility for blind people using USB firmware", International journal of Emerging Technology and Advanced engineering, volume 4, Issu6, (January 2014) pp:647-651.
[6]. Nisha Ashok Somani,"ZIGBEE: A low power wireless technology for industrial applications", International Journal of control theory and computer modeling, volume no.2,May 2012 pp: 27-33.
[7]. AniketWani,"RFID Based Intelligent Trolley system using ZIGBEE", International Journal of Engineering & computer science, volume No.4. Issue 3, March 2014. pp: 10886-10889.
[8]. VarshaJalkote,"Futuristic Trolley for Intelligent billing with Amalgamation and RFID & ZIGBEE", ICRTET 2013, pp: 18-22.
[9]. Ms.RupaliSawant ,"The radio based smart shopping cart",International Journal of Research and General science , volume 3,Issue 2,march-april 2015,pp:275-277.
[10]. Ms.Vrinda,"Novel model for Automatic Purchases using Intelligent cart ",IOSR-JCE,volume no:16,Issue 1.pp:23-30.