IOT BASED SMART TROLLEY WITH SMART CARD SHOPPING

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ABSTRACT

Large grocery shops at present days are used by billions of peoples to get their daily neccesity. Purchase is becoming a part of daily activity in modern cities. We can see huge rush at malls on holidays and weekends. The rush is even more when there are special offers and discount. People purchase different items and put them in trolley. After finished their purchase needs to pay the bill in billing counter.The bills are prepared by bar code reader which is a time consuming process and results in long queue at billing counters.The main aim is to develop a system which is used in shopping malls to solve the above mentioned challenge. The system will be placed in all the trolleys. It will consist of a RFID reader. All the products in the mall will be equipped with RFID tags. When the customer puts a products in the trolley, its code will be detected and the price of those products will stored in the memory. As we put the products, the costs will get added to total bill. Thus the billing will be done in the trolley itself. Item name,cost will be display on touch screen. Also the product's name and its cost can be announced using headset. At the billing Counter the total bill data will be transferred to PC by ZigBee Modules. In this project that the proposal of an architecture and solution of a innovative system for the acquisition of products in grocery shops (Intelligent Cart). The Intelligent Cart study an emerging mobile technologies and automatic identification technologies (such as RFID) as a way to improve the quality of services provided by retailers and to augment the consumer value thus allowing to save time and money.
KEYWORDS: *RFID tag and reader,Pic microcontroller,Wireless module,IOT technology,RF transmitter and receiver,IR sensor.*

I.   INTRODUCTION:

A people get their day to day necessities from the shopping malls such as food products, clothing, electrical appliances an so on.,. At present, a numbers of large as well as small shopping malls have increased around the globe due to increasing public demand & spending. 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. To overcome these problems and to improve the existing system, we have designed a RFID BASED SHOPPING CART. This can be done by simply attaching RFID tags to the products and a RFID reader with shopping trolley. This system helps the customer to know the information of the product such as price of every item which is scanned via RFID reader, total price of the item and also brief about the product. This system will save time of the customers and reduce the manual work in malls which is beneficial for the shop owners and also as user friendly to the customers.

EMBEDDED SYSTEM:

Embedded System is a combination of hardware and software used to achieve a single specific task. An embedded system is a microcontroller-based, software driven, reliable, real-time control system, autonomous, or human or network interactive, operating on diverse physical variables and in diverse environments and sold into a competitive and cost conscious market. An embedded system is not a computer system that is used primarily for processing, not a software system on PC or UNIX, not a traditional business or scientific application.High-end embedded & lower end embedded systems.

High-end embedded system - Generally 32, 64 Bit Controllers used with OS. Examples Personal Digital Assistant and Mobile phones etc.Lower end embedded systems - Generally 8,16 Bit Controllers

used with an minimal operating systems and hardware layout designed for the specific purpose. Examples Small controllers and devices in our

everyday life like Washing Machine, Microwave Ovens, where they are embedded.

INTERNET OF THINGS:

The term Internet of Things generally refers to scenarios where network connectivity and computing capability extends to objects, sensors and everyday items not normally considered computers, allowing these devices to generate, exchange and consume data with minimal human intervention. There is, however, no single, universal definition. The concept of combining computers, sensors, and networks to monitor and control devices has existed for decades. The recent confluence of several technology market trends, however, is bringing the Internet of Things closer to widespread reality. These include Ubiquitous Connectivity, Widespread Adoptionof IP-based Networking, Computing

Economics, Miniaturization, Advances in Data Analytics, and the Rise of Cloud Computing.

PIC16F877A MICROCONTROLLER

In this project we used PIC 16f877A microcontroller. For most applications, we will be able to find a device within the family that meets our specifications with a minimum of external devices, but which will make attaching external devices easier, both in terms of wiring and programming. For many microcontrollers, programmers can built simple budget, or even built in to the final application circuit eliminating the need for a separate circuit. Also simplifying this requirement is the availability of micro-controllers with SRAM and EEPROM for control store, which will allow program development without removing the microcontroller for the application circuit.

RFID TECHNOLOGY

Radio frequency (RF) technology is used in many different applications, such as television, radio, cellular phones, radar, and automatic identification systems. RFID stands for radio frequency identification and describes the use of radio frequency signals to provide automatic identification . Unlike the electronic article surveillance (EAS) systems used for theft detection, RFID provides a unique serial number for identification of an object . RFID is used in the Mobile Speedpass system to pay for gas without going into the store, in automobile immobilizer systems to prevent theft by uniquely identifying a

without stopping, in animal identification, in secure entry cards,secure access to buildings, and in the supply chain to manage the flow of pallets, cases, and items. RFID technology was invented in 1948, but it was not commercialized until the 1980s. One of its first known applications was during Second World War, when it was used by the British radar system to differentiate between friendly and enemy aircraft with attached radio transponder
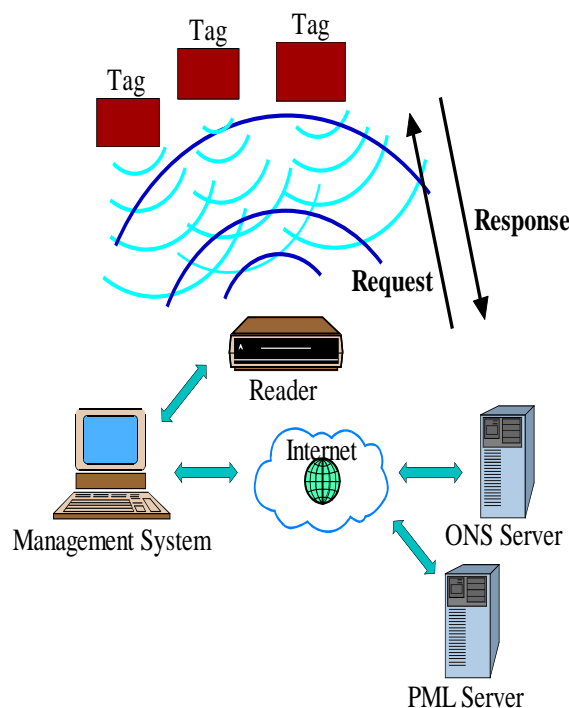

FIG-1 :RFID System

II   LITERATURE SURVEY

Galande Jayshree, Rutuja Gholap, Preeti Yadav in the year 2014 proposed RFID Based Automatic Billing Trolley. This paper proposed a system that will be placed in all the trolleys. It will consist of a RFID reader. All the products in the mall will be equipped with RFID those products will be stored in memory. As we put the products, the costs will get added to total bill. Thus the billing will be done in the trolley itself. Item name and its cost will be displayed on LCD. Also the products name and its cost can be announced using headset. At the billing counter the total bill data will be transferred to PC by wireless RF modules.

key with an embedded chip, in FastLane and E-Z Pass toll road systems to automatically pay tolls

Several previous studies have also discussed the development of marketing

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applications, including the study entitled "Design of EMarketing at PT. Rajawali Nusindo" [6] and "Design of Web-based Marketing Information Systems at BMT (Baitul Maal Wattamwil) Cita Sejahtera" [7]. The purpose of this system is a media campaign for the company. This system other than as a promotional media can also process ordering goods, ordering transaction processing, and display the status of the goods, as well as providing reports the purchase of a product level. However, there are still shortcomings in the system, especially in terms of marketing, which is a form of promotion that is carried out is limited to display only items available. There is no specific approach to attract potential buyers to purchase the product supplied. Limited mobility and lack of customer personalization

III EXISTING SYSTEM

In existing system,When a person goes for shopping mall then he take trolley and after complete shopping he has to pay bill on billing counter.Billing is done by using barcode reader.It is more time consume process.In Barcode technology,there is need to scan each and every item based on position of that barcode label attached to that item .It requires more human labour as they need to scan manually.It does not read from long distance.so our aim is to design automatic billing trolley which is based on RFID technology

IV PROPOSED SYSTEM

The main aim of this proposed project is to develop a system which is used to solve the problem in the conventional trolley method and also provide child missing alert in that trolley itself .In this system RFID reader will be placed in each and every trolley in the mall and all the products will be equipped with RFID tags. When a person puts any products in the trolley, it's code will be detected and price of those products will be stored in the memory ,its name and cost will be displayed on LCD and it will send to billing counter by wireless module. This trolley can be used to track the child 's location from the trolley when there is a big crowd in the mall. Which is possible by using RF transmitter and RF receiver. RF receiver is placed in corresponding trolley of the customers(parent's)and RF transmitter is given to their child .so if the child moves far from their trolley then immediately that trolley generates alert message for customer(parent's).

In this,IR sensor can be attached with the trolley to prevent the theft.Basically to ensure automation of the system, the scanner is connected to the base station located at the payment counter. When a customer scans a product all the information such as price and name of the product is displayed while the weight of the product is also stored in the database against all barcodes. Weight of products is an important factor to double check the identity of product to protect against discrepancy or dishonest activity. A load cell, which is basically a weight sensor, is located at the bottom of the Smart Trolley. The output of the load cell helps in decision making against abnormal activities. For example if the weight of the product measured by the load cell is not matching with the actual weight of the product then it is referred as a case of discrepancy at the base station.If any customer after purchasing the product changes his mind and wants to return the product, he just has to scan the product again.
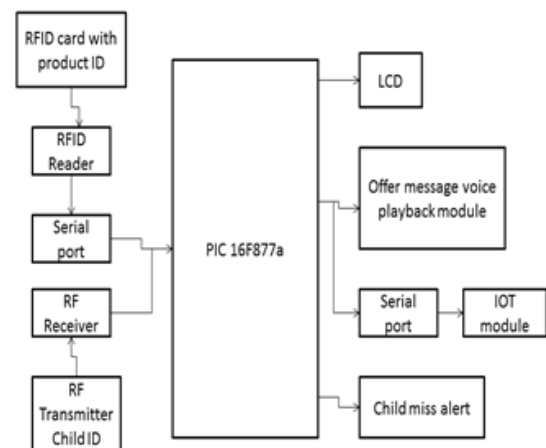

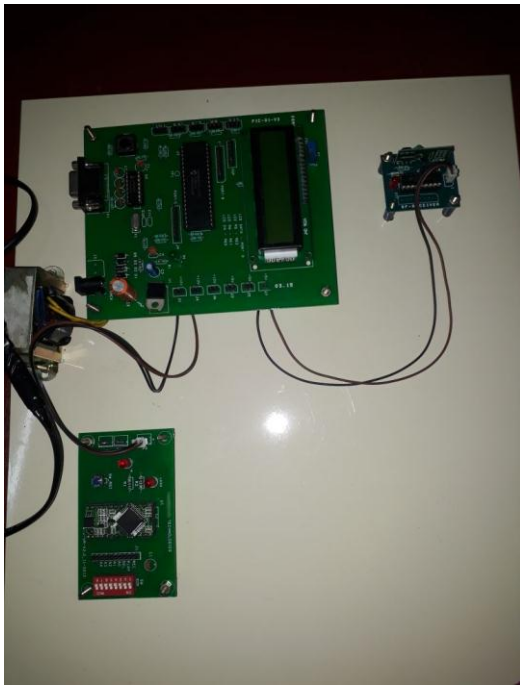**Fig-2:Operational diagram**

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FIG:HARDWARE

V SOFTWARE TOOLS

- Development tool – MPLAB IDE v7.42

- Hardware Compiler - HI-Tech PIC C

- Programmer - PIC Flash

- Hardware Simulation tool - Proteus v7.6Sp0

INTRODUCTION TO EMBEDDED 'C':

Ex: Hitec – c,

HI-TECH Software makes industrial-strength software development tools and C compilers that helps the software developers write compact, efficient embedded processor code. For over two decades HI-TECH Software has delivered the industry's most reliable embedded software development tools and compilers for writing efficiently and compact code to run on the most popular embedded processors.

HI-TECH PICC is a high-performance C compiler for the Microchip PIC micro 10/12/14/16/17 series of microcontrollers. HI-TECH PICC is an industrial-strength ANSI C compiler - not a subset implementation like some other PIC compilers. The PICC compiler implements full ISO/ANSI C, with the exception of recursion. All data types are supported including 24 and 32 bit IEEE standard floating point. HI-TECH

PICC makes full use of specific PIC features and using an intelligent optimizer, can generate high-quality code easily rivaling hand-written assembler. Automatic handling of page and bank selection frees the programmer from the trivial details of assembler code.

MPLAB INTEGRATION

MPLAB Integrated Development Environment (IDE) is a free, integrated toolset for the development of embedded applications employing Microchip's PIC micro and dsPIC microcontrollers. MPLAB IDE runs as a 32-bit application on MS Windows, is easy to use and includes a host of free software components for fast application development and super-charged debugging. MPLAB IDE also serves as a single, unified graphical user interface for additional Microchip and third party software and hardware development tools. Moving between tools is a snap, and upgrading from the free simulator to MPLAB ICD 2 or the MPLAB ICE emulator is done in a flash because MPLAB IDE has the same user interface for all tools.
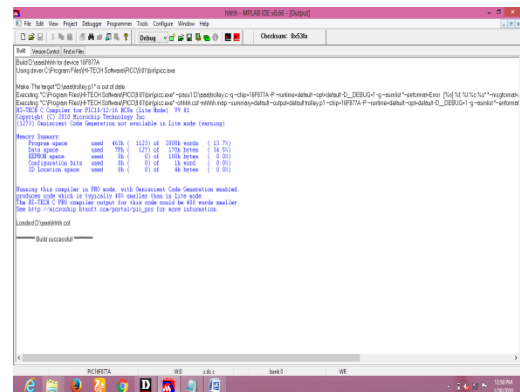

Fig:Coding Verified using MPLAB-IDE

VI CONCLUSION

In this paper ,We propose a secure smart shopping system utilized RFID technology.This trolley make it user friendly.Lcd display the name of product,weight,expiry date and cost of product for bilingl.Automatic billing is done in trolley so it save the time of customer and reduce rush at billing counter.Using of IOT will also helpful to owner for various purpose.

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