AN INTELLIGENCE SUPER MART BILLLING SYSTEM

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Abstract- Currently embedded systems be mainly based on microcontroller's i.e. CPUs in the company of included reminiscence the same as well as tangential interface except ordinary microprocessors by means of external chips for memory and peripheral interface circuits are common, especially in technology may not only be useful for streamlining category and supply chains. Nowadays it is rare to see people getting keen in online shopping through e-commerce websites but still the shopping centers are popular. We come across many types of carts used for shopping in malls and shopping center. The major purpose of this effort is reducing delays in foremost supermarkets or shopping center via income of an electronic smart cart method which will introduce an cognitive approach to billing system during RFID technology. Zigbee is base scheduled an IEEE 802.15 ordinary. Zigbee devices a group of pass on data more than longer space by transient data through transitional devices to make more distances ones, create a interconnect network. Purchasing product during a RFID reader going on shopping cart, suggest while product information resolve be stored into EEPROM close to it and EEPROM data spirit send in the direction of central billing system throughout Zigbee module. The anticipated method will survive helpful for avoiding queues in shopping malls for billing. Hence the shopping becomes easy and enjoyable.

Index terms*: Product Identification Device EEPROM, RFID Reader, RFID Tag, Smart Shopping

I. INTRODUCTION

In this fast growing world, all are turning towards electronic based business transaction. Programmers build up software application each day within a sort to augment effectiveness and production in a combination of situation. A system is a approach of working, organizing or doing one or many tasks according in the direction of a permanent plan, program or set of laws. A system understands in which the entire their units collect and work in concert according toward the plan or program. An embedded system is one to facilitate have computer hardware through software embedded in it's as one of it's the majority of the essential component. It is a dedicated computer based system for an applications or product .It may be either an autonomous system or a small.

Zigbee is built on top of the IEEE 802.15.4 standard. Zigbee provide routing and multi-hop function to the small package based broadcasting protocol. Zigbee is small price and low motorized mesh set of connections extensively deployed for calculating and monitor application where it covers 10-100meters within range. This message system is less expensive than the other proprietary short range wireless antenna system as Bluetooth and Wi-Fi.

With the initiation of knowledge, it is recommended to offer the customers, the facility to connect the bank account details in their smart ID card online using the authorized. With the proposed system the existing old system such the same as the standing queues system and recharge their smart ID cart can be replaced with the smart RFID cart and any banking account transaction for the clients. To encourage people more often and on different occasions offers to need to be introduced which will increase the sale.

1.1 Problem Statement

Frequently, people encounter a problem of spending too much of their time waiting queues for billing their purchases in different shopping centers or supermarkets. Waiting in queues unenthusiastically affect human morale and possibly will cause misunderstandings' surrounded by people, for illustration, when somebody break the line and situate in frontage of other people. The proposed system project aims to eradicate this difficulty by introduce a intelligent billing methods, speeding up the payment process. Smart cart recharge process middle class people not

in use they don't have big amount money, so we are proposed with the any banking system to connect smart ID cart and speeding up the payment process.

1.2 Barcodes

Fig1. is an electronic piece of equipment that can interpret and yield in print barcode to a computer. Like a flatbed scanner consist of a brightness foundation, a lens and a brightness antenna translating visual impulses into electricalone. Additionally almost all barcode readers enclose decoder circuitry analyze the barcodes picture data provide by the sensor and sending the barcodes comfortable to the scanner output port.

Fig1. Barcode reader

The major problem with the accessible system of barcode billing is the reality that every product is scanned simply one at a time so that total scanning time grows gradually as soon as near is plenty of purchased products. The barcode scanner is limited by direct visual contact with the barcodes. Thus it cannot scan barcodes that reside out of its vision.

Therefore, people still have a propensity to line up in queues in front of Cashier's counter due to the inability of cashier's billing speed to catch up with the flow of new customers willing to check-out.

1.3 Benefits

In the neighborhood perception, this project grants obvious remuneration as it has the potential to decrease significantly the queuing time of customers and save much of pervious time of every individual shopper. For instance, according to research of British researchers, average queuing time in UK stores is 5 minutes 54 seconds, which is sufficient to miss most of the important activities such as airplane departure. On the other hand, in the market owners and stakeholders perspective, this system will be beneficial regarding attracting more customers, since their market will provide fast service and save shoppers time. Moreover, the new shopping experience and emerging technology attract more people, especially the young generation.

II. Related work

The related work in this paper has been inspired with the idea of Digital India Concept. In this section, the existing techniques for shopping have been discussed.

VarshaJalkote ..,[1], proposed a system futuristic trolley for smart billing with Amalgamation of RFID and ZIGBEE. In this system they have used microcontroller, the RFID reader reads the RFID tag number and compared with stored tag numbers if it is present, then the product cost is added to the total bill amount, and product details are displayed in LCD screen like product cost,Manufacturing year, brand name etc. if it is not in found in data base it will display product is not found or not present and this process will continue until theend of shopping. The output of this proposed system is better than existing technology but it certain limitations because of them, it cannot be used to keep the all Sales track and item availability at the shopping malls.

Rupalisawant ..,[2], proposed the concept of The RFID Based Smart Shopping Cart, BAR code technology is replaced with RFID technology which has the advantage over BAR code in terms like reducing time spent during customer shopping and reduces salesmen required in malls to assist product details to the customers

Rajukumar...,[3], proposed a system intelligent shopping cart, in this system RFID technology and microcontrollers are used. In this system for every product a RFID tag number is fixed, RFID tag is read by RFID reader, if the tag number is matched with the database the it displays product details tagged to that id.

UditaGangwal..,[4], proposed a system smart shopping cart for automated billing propose using wireless sensor networks. In this system the RFID reader is used to read the RFID tags. Microcontroller is used in this system for comparing RFID tag number with the database if the RFID tag number is present it displays product details and still the system has certain limitations as we cannot make system which are used for billing through credit cards and ATM card at trolley itself, and hence we can further reduce the overall billing time. We cannot create the web server in this microcontroller system, to access this information on web server to check any products details. The microcontroller used in the proposed paper has No HDMI port, direct interfacing of audio, LCD is not possible.

Vrindagupta..,[5], proposed a system as analytical model for automating purchases using RFID enabled shelf and cart. In this system they have used microcontroller and RFID technology for implementing the system. The RFID reader reads the RFID tag number and sends the information to microcontroller, inmicrocontroller this received RFID tag number is compared with the

database, if it is not present then product details are displayed and the product cost is added to the total bill amount.

III.   Hardware Implementation

The hardware modules for the device are attached to shopping cart of the supermarket. It consists of microcontroller, display unit, EEPROM, RFID reader, ZIGBEE transceiver and the battery power source. The battery power source is increases the mobility of the device.

3.1Microcontroller

The low power, high performance CMOS 8-bit microcontroller with 8KB of the ISP flash memory. The device uses Atmel high density, nonvolatile memory technology and is compatible with the industry standard 80C51 instruction set and pin out. On chip flash allows the program memory to be reprogrammed in system. This powerful microcontroller is suitable for many embedded control applications.

Fig2.AT89S52 Microcontroller

The fig2. provides the following standard features: 8K bytes of flash memory, 256 bytes of RAM and 32 Input/output lines. Watchdog timer, two data pointers, three 16-bit timer/counters, a six vector two level interrupt architecture, a full duplex serial port, on chip oscillator and clock circuitry. The designed with static logic for operations down to zero frequency and supports two software selectable power saving modes. The power down mode saves the RAM contents but freezes the oscillator, disabling all other chip functions until the next interrupt.

3.2RFID Technology

Radio Frequency Identification (RFID) is a wireless data capturing technique from a tagged item. An RFID system comprises a reader and transponder. A middleware is a bufferStage that encodes the data captured from the tagged identification codes. Radio transponders are high frequency electronic circuits that broadcast the attributes of item. This allows these items to be remote detected, identified and tracked. RFID fall into the specialized category of automatic

identification (Auto ID) that uses an electromagnetic signal to communicate between the reader and the transponder.
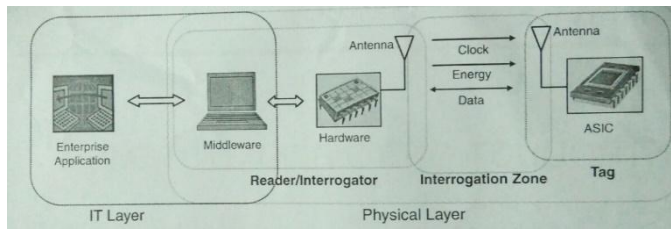

Fig3. Overview of generic RFID system

The Fig 3.Auto ID collects data related to objects and feeds that data into the database management system. There are different technologies such as Magnetic Ink Character

Recognition (MICR), Voice Recognition, Biometrics, Barcodes and RFID. Auto IDs are supposed to work without any human intervention, still technologies like biometrics, MICR, and optical barcodes require considerable human intervention for their operation. It uses wireless propagation of electromagnetic wave signals over a certain frequency spectrum.

One important feature enabling RFID for tracking objects its capability to provide unique identification. One of the possible approach to item identification is the EPC (Electronic Product Code), providing a standardized number in the EPC global Network is an Object Name Service (ONS) providing the adequate Internet addresses to access specific data. However, currently ONS cannot be used in a global environment.

3.3RFID Tags

The RFID tag is made up of three compositions such as antenna, encapsulation and transceiver. In RFID tags there are three types such as passive, semi passive and active tag. In passive tags also called 'pure passive', 'reflective' or 'beam powered. It obtains the operating from the reader. The reader sends electromagnetic waves that can be induce current in the tags antenna. The tag reflects the RF signal transmitted and adds information by modulating the reflected signal. In the proposed system we are using passive kind of RFID tag which will operate at very low frequency of 125 KHz. In semi passive tags are used as a battery to maintain memory in the tag or power the electronics that enable the tag to modulate the reflected signal. In active tags are powered by an internal battery used to run the microchips circuitry and broadcast a signal to the reader. Generally ensures a longer read range than passive tags. It is more expensive than passive tags (especial because usually are read/write). In active tags a battery source is required. In the passive

tags are not required. In the proposed system we are using passive tag will operate at very low frequency.

3.4 Wi-Fi Wireless Transmission

Another important technology used in smart card system is called Wi-Fi which is wireless data transmission technology based on IEEE 802.11 standard. It is transmit data signals in 2.4GHz or 5GHz. It allows for very high data rates. Wi-Fi is the currently most protocol for wireless connection and getting access to the internet. Today Wi-Fi hotspots can be found in about all chief construction in a elegant country. The smart carts work is use in this Wi-Fi technology for exchange of information read by RFID reader with the online cloud database which is some important data to be stored securely in the internet.. There are two methods of wireless signals used for communication between tag and reader. The methods are induction and propagation. Induction is closely proximity electromagnetic or induction field at near field. Generally use LF and HF frequency bands. The low frequency RFID tags

operate between 125 KHz and 134 KHz. These tags are mostly used for   animal tracking, for patients in hospitals, for vehicle immobilizer and so on. This is the most mature technology among RFID tags. The High frequency RFID tags operate at 13.56 MHz with similar power level globally fall under this category. These tags are used in maximum usage round the world currently. Another method is propagation it contains electromagnetic waves at far field. It operates in the UHF and microwaves frequency bands. Therefore the exchange of information between a smart cart and market Wi-Fi hotspot happens instantly.

3.5 RFID Readers

The RFID Reader which uses 5v power supply in this process.When RFID Reader is turned on then it electromagnetic signals to RFID tag. RFID reader classification by design and technologies are two methods read and read or write. Read tag only read data from the tags. It is usually a micro-controller-based unit with a wound output coil, peak detector hardware, comparators, and firmware designed to transmit energy to a tag and read information back from it by detecting the backscatter modulation. Read and write data on the tag. These signals are received by RFID tag and transmit RFID tag no to RFID reader.

3.6 Zigbee

ZIGBEE is the wireless language that everyday devices use to connect to one another. ZIGBEE is an IEEE 802.15.4 based specification for a suite of high level communication protocols used to create personal area networks with small, low power digital radios, such as for home automation, medical device data collection andother low power low bandwidth needs, designed for small scale projects which needs wireless connection. The devices can transmit data over long distances by passing data through a mesh network. The received RFID Tag number from ZIGBEE is also passed to server.This tag number is compared database if it ispresent in the database then product details like cost, manufacturing year and name oftheproduct is displayed and the end total bill information. The web portal is maintained at the server and being accessed from the cart.

IV.   Result analysis

Fig 4- RFID shopping cart kit

Fig 5- RFID reader

Fig 6- Overview of RFID kit

Fig 7- Displaying number of products and its total price

V. Conclusion

In this paper, we are implementing in a shopping mall to avoid wasting time by standing in queue to pay the bill .RFID reader is fixed in a trolley to read the data from the product. RFID tag is coded with the product in a shopping mall. If we take any product with RFID tag and it is scanned by the RFID reader. It automatically transforms the billing amount through ZIGBEE to personal server by wireless transmission. In the existing system, we have to recharge the amount what we are taken. But in proposed system, we directly connect to any bank and transform the billing amount to the server in ashopping mall. It gives the advantage of wasting time in standing queues and to get the products easily.

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