SMART TROLLEY SYSTEM FOR AUTOMATED BILLING USING RFID

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ABSTRACT

Now a days interest in shopping malls is widely increasing among people. People get daily necessities from shopping malls. There is an emerging demand for easy and quick payment of bills in shopping malls. Shoppers are frustrated at locating the items on the shopping list when shopping in shopping malls and when no assistance is available in shopping. To eliminate these problems, each product in the shopping mall will be provided with a RFID tag, to identify its type. Each shopping cart is implemented with a Product Identification Device (PID) that contains a microcontroller, an LCD, RFID reader and a transmitter. RFID reader will read the purchasing product information on the shopping cart and the information about the product is displayed on LCD which is interfaced to the microcontroller.

In this project, Ardiuno IDE microcontroller is attached to an RFID reader and a barcode reader. As the user puts items in the trolley the reader on the trolley reads the tag and sends a signal to the controller. The controller then stores it in the memory and compares it with product ID. If it matches, it shows the name of item on LCD and also total amount of items purchased. Once the shopping is finished, the customer will press a button on the trolley send the total amount spent on the products to the billing counter section using wireless communication module. In this project, there is a chance to revert back the product according to our need and budget. Once you take back product from the trolley, the same card will be again read by the RFID reader, then the controller will deduct the same amount associated to that product, from the net bill amount.

Index Terms:-Billing System, RFID , Ardiumo IDE,

1. INTRODUCTION

Mall and market is a big corner for customer to purchasing the daily requirement like branded food item, snacks, cloth materials, electric and electronic devices etc. Nowadays, a maximum numbers of shopping mall are available large as well as small in th e world. In holidays and weekend time we can see a huge rush at mall. The public was demand & spending more time in shopping mall.

After purchasing a long time, the customers waste of unnecessary time at the billing counter for billing the purchased item. Continuously improvement was compulsion in the common billing system to increase the quality of shopping experience to the customers. To overcome these problems and to change and improve the existing system, we have designed a SMART

SHOPPING TROLLEY. This can be done by simply attaching using RFID tags to the products and a RFID reader with a LCD display on the shopping trolley. In this system, customer will have to know the price of each and every item that is scanned in with help RFID and LCD, total price of the item will be displayed in LCD and also brief about the product. In this system will save time of customers and manpower required in mall. It is also used to reduce the employee work in the shopping mall. An innovative product with societal acceptance is the one that aids the comfort, convenience and efficiency in everyday life. Purchasing and shopping at big malls is becoming daily activity in metro cities. There will be rush at these malls on holidays and weekends. People purchase different items and put them in trolley. After completion of

purchases, one needs to go to billing counter for payments. At billing counter the cashier prepare the bill using bar code reader which is very time consuming process and results in long queue at billing counter.

2. LITERATURE SURVEY

Dr. Suryaprasad J[1] in "A Novel Low-Cost Intelligent Shopping Cart" proposed to develop a low-cost intelligent searching aid that assists the client to go looking and select product and inform the client on any special deals out there on the product as they move around within the shopping complex.

Amine Karmouche [2] in "Aisle-level Scanning for Pervasive RFID-based Shopping Applications" proposed to develop a system that's ready to scan dynamic and static products in the shopping space using RFID Reader antennas. Instead of conducting the RFID observations at the level of individual carts, aisle-level scanning is performed.

Satish Kamble [3] in "Developing a Multitasking Shopping Trolley Based on RFID Technology" proposed to develop a product to help someone in everyday searching in terms of reduced time spent while purchasing. The main aim of proposed system is to produce a technology oriented, low- cost, easily scalable, and rugged system for assisting shopping in person.

Mr. P. Chandrasekar [4] in "Smart Shopping Cart with Automatic billing System through RFID and " proposed to develop a cart with a Product Identification Device (PID) which will contain a microcontroller, a LCD, an RFID reader, EEPROM, module. Purchasing product information will be read through a RFID scanner on cart, meanwhile product information will be stored into EEPROM attached to it and this EEPROM information will be send to Central billing System through module. The central billing system gets the cart data and EEPROM information, it access the product database and calculates the total amount of purchasing for that particular cart.

3.METHODOLOGY

The proposed system in this will be implemented into two parts . First part is the initialization of the Ardiuno for the set up of RFID Reader . Second part is the tag detection of products by RFID Reader which are placed in the cart and sending of product information from cart to Central billing unit through . The overview working of this system is - This proposed system works as on customer getting into the mall she/he first takes a trolley. Every cart is connected with a RFID reader ,a microcontroller and LCD screen. When the customer starts dropping products into the trolley, tags will be read by the reader and the reader sends the information to the microcontroller. The

microcontroller compares the information with the data already stored in it. If the data matches then the cost of that product will be displayed on the LCD screen for user . If the user wish to remove any product from the cart then they can take away that product from trolley and cost of that particular product will be subtracted from the total amount instantaneously and after shopping the products data with total amount gets transmitted to the central billing system through . The RFID Reader will be placed in the mid position on the base/bottom inside the trolley. The cart is designed in such away that the outerpart of the trolley will be covered with RF(Radiofrequency) shielding in order to make sure that the RFID reader will not read any products associated with tags outside the cart. Figure 3.1 shows the block diagram of proposed system in which reader is connected to Ardiuno which in turns gets connected to LCD which then sends billing information to Central Billing unit
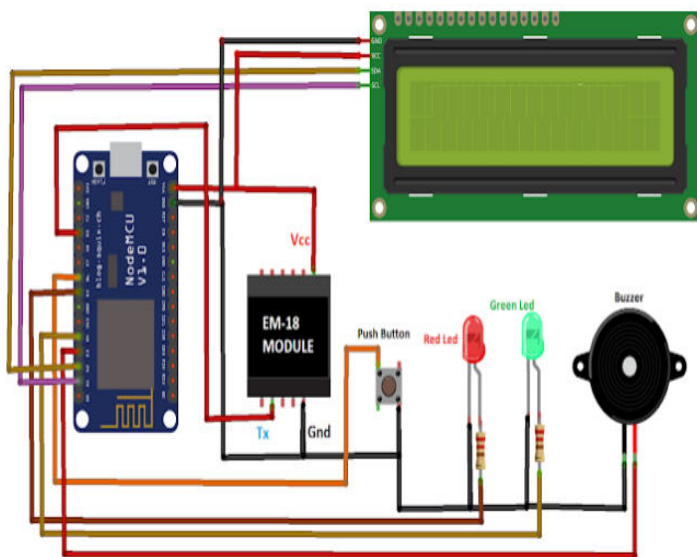
4.IMPLEMENTATION

start the proces Initialize the system Scan an item in RFID tagsCheck the RFID tag If the tag is registered or scanned, RFID reader can read the data related from memory Display the data and cost with help of LCD The item is added automatically the item cost also add and produce the total cost If any item is removed, the total cost is subtracted by the particular removed item and again the process will be continuing Send the total amount in the billing systeThe process is end
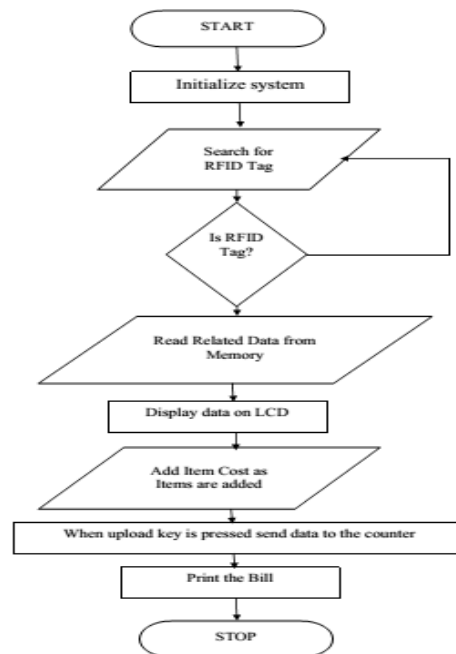

Figure 2 Flowchart of the system

Figure 1Circuit Diagram

All the items in the mall will be equipped with RFID cards. When person puts an item in the trolley, its card will be scanned by the RFID reader.Reader send this code to Arduino Uno which further reads item's name, cost & other details. Then it displays on LCD. The item details like name, price & total bill of things inserted in cart are displayed on liquid crystal display. As we put the items, the costs will get added to

total. Thus, the billing is done. Simultaneously all details are displayed on LCD. LCD used is 16x2 character alphanumeric type displays. And additionally if we would like to get rid of some inserted item, then that amount are mechanically subtracted from the entire amount and item removal message is displayed on LCD. We are planning to use RFID tags which has one hundred twenty five kHz passive sort tags. Transponder (tag) is attached to the object. An RFID tag consists of a very small microchip and antenna. RFID tags will are available in a large style of sizes, shapes, happens wirelessly and usually doesn't need a line of sight between the devices. An RFID Reader can read through most anything. The RFID Reader emits a low-power radio emission field that is employed to power up the tag therefore to pass on any data that's contained on the chip. LCD is interfaced with Arduino Uno. It is used to indicate clients the action taken by customer that's inserting of an item, removal of item, item's value and total request value of things in the trolley. At the billing Counter, the cashier counts the total number of items and collects cash and the total bill is provided to the customer.complete proposed automatic solar tracker

5. CONCLUSION

In this system, the implementation The Arduino Uno is used in this system with a minimum number of components The proposed model is easy to use, low-priced and does not require any special training. This model keeps an account and uses of the existing developments and various types of radio frequency identification and detection technologies which are used for item recognition, billing and inventory update. As the whole system is becoming smart, the requirement of manpower will decrease, thus benefiting the retailers. Theft in the mall will be controlled using this smart system, which further adds to the cost efficiency. The time efficiency will increase phenomenally since this system will eliminate the waiting queues. More customers can be served in same time thus benefiting the retailers and customers as well.. Model can be further extended, to prevent the loosing of the intelligent/smart shopping cart. It can be concluded that the initial cost of the model may be high but the in subsequent years the model will be beneficial as compared to the system using barcode or manual system.

Further, a more advanced micro controller, larger display module and a service to pay the bill within the cart by using swapping card can be used, thus providing the customers better services, improved consumer experience and improving time complexity to a great extent.

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