AN IMPLEMENTATION OF ELECTRONIC SHOPPING CART TRANSACTION AND DISPLAY SYSTEM USING WIRELESS TECHNOLOGY POWERED BY IOT

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***Abstract:** In this paper this we will ensure customer easy, finance handling, overcome disadvantages of online shopping, increasing sales making both management and customer happy. This application will help avoid long queues and provide a hassle free checkout. It will not only reduce the amount of waiting time, but it will also reduce or eliminate the need for a cashier. We basically introducing project into two sub divisions to help both customers and management. We have two different methods of purchasing one kind is using trolley and other one through virtual cart. In a trolley section will be having a RFID reader will detect the products when they dropped inside a trolley, and also there will be few features like budget planner and displaying the number of product and total cost. When the trolley reaches billing area ZigBee will send entire details to main server and payment options chosen according to customer convenience. In a virtual cart section an android app is developed in such a way that customer does not needed to carry trolley he can just go to a store check the quality of products if he satisfies just order through mobile. In a similar way to trolley here also offers and budget planner will be displayed on mobile, once completion of all the purchases he can go to billing section where they deliver the products to the customer on his convenience pick up his purchase and drop them in trolley or he can just cart through mobile and avoid wait in the long queue to make payments. For offers using QR code scan through mobile phone and get different offers from each rack.*

Index Terms - Zigbee, RFID, QR Code, virtual cart, budget planner.

INTRODUCTION

This project presents a novel method of collaborating ease in smart shopping and the sense of security money wise as well as for customer satisfaction while doing shopping offline. This is implemented using an Android application. In Shopping mode, the customer needs to physically pick up his purchase and drop them in trolley or he can just cart through mobile and avoid wait in the long queue to make payments. The application mentioned here would read the RFID code(s) of the product(s) & add it to the shopping cart in the application. It provides methods to change the quantity of product/s purchased and edit the list. Along with this the customer would be informed about the on-going offers in the store. Payment can be according to customer convenience

III. OVERVIEW

In the first step of this project, a cart is designed to make shopping easy, this trolley can scan all the products which are dropped inside it with the help of an RFID readers and a light sensor is added to identify the un scanned products and also display the total cost of products, budget and in a billing section entire data is transferred through the ZigBee to billing section. A mobile application is developed to make shopping process easy. This application is designed in such a way that it holds information about all the products available in the shopping mall with price. As soon as the shopper opens the app, list of items with price gets displayed. The customer goes through the items and will select the desired items. After selecting, this application sorts the selected items and displays them and rest process work as same as in trolley at billing section.

IV. CONVENTIONAL METHODS

Conventional method is a tedious and time consuming job. Although the growing trend of online shopping has reduced. some load, there is still some difference in actually going to shops, and hand picking products to get the feel of their quality and features, that cannot be experienced online. Customers also feel wary to carry out online purchases due to fear of less secure transaction process that may lead to hacking of user's sensitive data, insecurity of credit/debit cards, unreliability or breach of privacy. The project aims at removing flaws of both kinds of shopping, and bridge the gap between physical and virtual world. In Conventional method, the customer has to wait in long queues at the cash counter. The cashier scans RFID for every individual product and then generates the bill. This consumes lot of time and energy of both the shopper as well as cashier. To overcome this flaw, the customer himself can scan the items and get the exact amount in trolley itself or it can also get done with the virtual cart.

V. MODERN TECHNOLOGY

In a modern technology there will be two alternative methods of shopping are introduced one is with a trolley and other with the help of android app known as virtual cart. In a trolley section will be having a RFID reader will detect the items when they dropped inside a trolley, a light sensor will detect the number of items, if they are not scanned it will indicate them through alarm, if the cart has unwanted product it can be taken out and the particular amount of that product is subtracted and also there will be few features like budget planner and displaying the number of product and total cost, if the budget exceeds to the limit what we fed to trolley it indicates, even the budget can be modified with the help of keypad present on trolley When the trolley reaches billing area ZigBee will send entire details to main server and payment options chosen according to customer convenience. In a virtual cart section an android app is developed in such a way that customer does not

needed to carry trolley he can just go to a store check the quality of products if he satisfies just order through mobile. In a similar way to trolley here also offers and budget planner will be displayed on mobile, once completion of all the purchases he can go to billing section where they deliver the products to the customer on his convenience.

The proto system aim is to eliminate all the inconveniences as possible from the systems and to make a system, which is consumer kindly, customer-friendly and high performing. The system's aim would be consumer convenience and an overall time efficiency and high performance. This goal could be achieved by using the Zigbee system implemented using RFID technology. Present scenario in shopping supermarkets are, time consumption is big problem at billing section. Consumers have no idea about the present day offers in supermarkets. Sometimes, shopping is done beyond the budget of the customer. So keeping all these in mind the system needs to be developed which provides customer an easy to use interface and also a way for the vendors to endorse more products alongside and achieve high profit. This could be achieved through the RFID technology, which is currently in its preliminary stages. At vendor side, GSM technology is implemented to know about the overall products/ high sold products in supermarkets at the end of day. By this vendor can stock the products early to supermarkets.

VI. PROPOSED SYSTEM

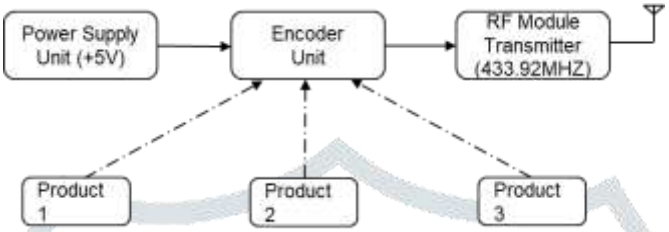

Figure1. Product section

Figure 1 shows the information about the product section, each product is having unique RFID Tags and they are encoded by an encoder which gives the information about the product when they dropped inside the trolley.

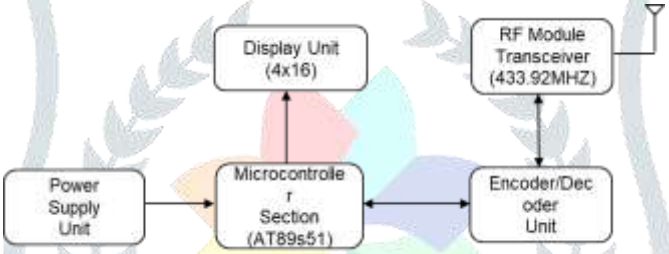

Figure2. Trolley section

Figure 2 shows the information about a trolley section with a power supply to give the necessary supply to microcontroller, each trolley will be having a RFID reader will detect the items when they dropped inside a trolley, a light sensor will detect the number of items, if they are not scanned it will indicate them through alarm, if the cart has unwanted product it can be taken out and the particular amount of that product is subtracted, addition and subtraction of products will be taken care by encoder and also there will be few features like budget planner and displaying the number of product and total cost, if the budget exceeds to the limit what we fed to trolley it indicates, even the budget can be modified with the help of keypad present on trolley When the trolley reaches billing area ZigBee will send entire details to main server by RF trans receiver and payment options chosen according to customer convenience.

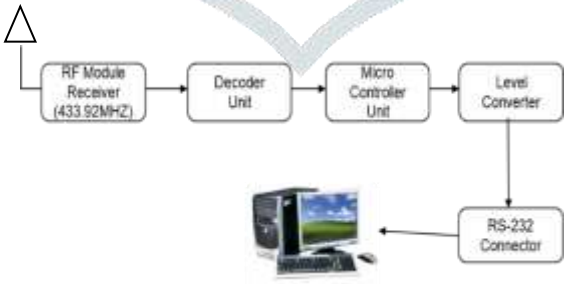

Figure 3. Billing section

Figure 3 shows the information about billing section the RF module will receive an entire details and the total billing details will be sent from ZigBee received here and decoder will decode the billing details and which is processed by microcontroller and fed into computer with the help of RS232 connector and processed for further payment convenience.

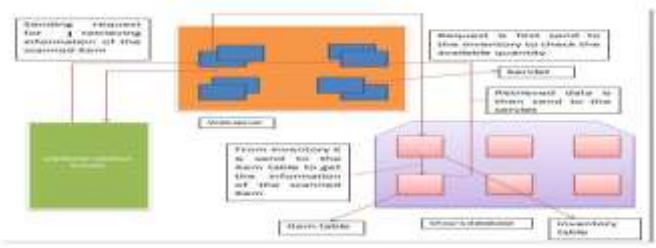

Figure 4.andriod application

Figure 4 shows the information about android app section an android app is developed in such a way that customer does not needed to carry trolley he can just go to a store check the quality of products if he satisfies just order through mobile. In a similar way to trolley here also offers and budget planner will be displayed on mobile, once completion of all the purchases he can go to billing section where they deliver the products to the customer on his convenience

VII. A.Possible outcome

-Since we are using RFID and microcontroller for real time tracking of particulars it is much ease to identify or track the particulars.
-Efficient for getting output in less time.
-Moderate cost utilization.
-Less human error occurrence chances

1.1. P89V51RD2*:*

The main centre part of the project is the microcontroller. Here we are using the 8051 based Philips P89V51RD2 microcontroller. The P89V51RD2 are 80C51 microcontrollers with 64kB flash and 1024 B of data RAM. A key feature of the P89V51RD2 is its X2 mode option. The design engineer can choose to run the application with the conventional 80C51 clock rate (12 clocks per machine cycle) or select the X2 mode (six clocks per machine cycle) to achieve twice the throughput at the same clock frequency. The flash program memory supports both parallel programming and in serial ISP. Parallel programming mode offers gang-programming at high speed, reducing programming costs and time to market. ISP allows a device to be reprogrammed in the end product under software control. The capability to field/update the application firmware makes a wide range of applications possible

1.2.RFID reader:

Radio frequency identification (RFID) technology is a wireless communication technology that enables users to uniquely identify tagged objects or people. RFID is rapidly becoming a cost-effective technology. The Department of Defence (DoD) to incorporate RFID technology into their supply chains. Although the foundation of the Radio Frequency Identification (RFID) technology was laid by past generations, only recent advances opened an expanding application range to its practical implementation in all perspectives.

RFID is only one of numerous technologies grouped under the term Automatic Identification (Auto ID), such as bar code, magnetic inks, optical character recognition, voice recognition, touch memory, smart cards, biometrics etc. Auto ID technologies are a new way of controlling information and material flow, especially suitable for large production networks.

The RFID technology is a means of gathering data about a certain item without the need of touching or seeing the data carrier, through the use of inductive coupling or electromagnetic waves is done. The data carrier is a microchip attached to an antenna (together called transponder or tag), the latter enabling the chip to transmit information to a reader (or transceiver) within a given range, which can forward the information to a host computer. The middleware (software for reading and writing tags) and the tag can be enhanced by data encryption for security-critical application at an extra cost, and anti-collision algorithms may be implemented for the tags if several of them are to be read simultaneously. One important feature enabling RFID for tracking objects is its capability to provide unique identification.

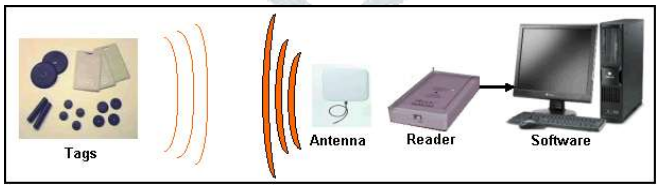

*Fig.1.2.1****:Basic block diagram of RFID***

B.Motivation

In future, we can add set of characters for selected products. Also, we can add motion gesture to do some critical action, such as like and dislike. For instance, User can give like.

VIII. FUTURE SCOPE

- Stock inventory management can also be done without using GSM by IOT.
- At shopping process all details of products purchased is directly stored in a cloud by which direct billing can be done.
- Enhancement can be done to increase wide range in supermarkets by using LAURA technology.

IX. RESULT

In result the representation of purchased products and payment process is done. Customer first takes trolley as enters into mall,And products purchased are monitored and amount is displayed in trolley itself which is fixed in trolley.

Result parameter

- Range
- The range of a system is the distance between the tag and the system to read.
- Total cost.
- The cost is display on display. Which in turn helps customer to shop according to their budget and preferences.
- Processing time
- Scanned products are processed fast without any delay.

Comparing existing system with the current technology, based on different parameters RFID is better. (Range, Total cost, Processing time and Status Scenario) where RFID having 1.5 cm, as well RFID cost is also cheaper. By the help of RFID the complete list of the products and their information in the cart are displayed. Automatic billing is done without wasting time at billing section and avoids standing in a long queue.

X. ADVANTAGES:

- This system helps in achieving a faster billing system.
- It helps buyer to know the bill details in advance so that they can plan accordingly in affordable prices.
- Intimates about the current offers present by showing a pop-up in trolley screen.
- Helps in business promotions for the supermarkets by gaining more customers providing quick service.
- Easy to use and does not need any special training. -Introduction of artificial intelligence increases profit for sellers

XI. CONCLUSION

As the demand for the mobile shopping is increasing the requirement of more secure, safe and reliable transaction is of utmost demand. Smart phones, that have become an important part of today's life, have reduced all the efforts that are required for shopping. Here customer satisfaction improved through virtual cart that is done with the help of android app. There are much advantages of it: first no need to stand in the queue for a long time in malls just for scanning the item, second there will be no scope for the frauds that happen in mobile shopping. And customer and management relationship will be improved, the items so far purchased by the customer will be maintained in the app that can be used by the customer in the next purchase. The transactions that will take place frequently with the shop's database will be made secured. This will ensure no modifications in the shop's database either by the customer or by any unauthorized user