RESEARCH ARTICLE OPEN ACCESS

Automated Billing Cart

Muhib A. Lambay[1] , Abhishek Shinde[2] , Anupam Tiwari[3] , Vicky Sharma[4]
Assistant Professor [1], UG Students [2], [3] & [-4]
Department of Computer Engineering
Theem College of Engineering
University of Mumbai, Boisar
Maharashtra - India

ABSTRACT

When we go for shopping we usually select the required products and add them into the shopping cart. But when it comes to the final bill payment there are no adequate counters in the mall that can handle all the customers. Also scanning each and every product of all the customer becomes a huge task and leads to large queue formation. Due to this our valuable time is wasted, so by keeping this in mind, we have modified a cart which will contain a barcode scanner by which the customer can scan the product and automatically the product id, product name, quantity and other details are stored in the Wamp database which will be fetched and displayed on the android app. Scanner will keep the track of products added to the cart. Each cart has some unique ID, an android application will use this ID so that the database can be accessed by the user through Wi-Fi module. The mall's computer will display all the list of product added to the cart and the final bill will be generated. This application is based on android platform as most of the people use android phones.

Keywords :- Shopping Cart, Android Application, Wamp Server, Wi-Fi module.

I. INTRODUCTION

Shopping means a group of people uniting at one place for buying the products. The shopping format has been changed over the recent years. In older days, the seller use to take their products and roam here and there selling those products but now this scenario has been changed. Thus later the concept of shopping grew greatly in business. Market is growing day by day, everyone wants to save their time and gain profit while shopping.

Mankind always invented things according to their needs. As time passed human being became more demanding. In olden days there used to be some shops but as time passed by, some businessman started investing their money in market; they started the business of selling and buying the products. Hence the concept of mall came into pictures and in 1970's barcode technology came into existence. All such advancements need to be made to make the existing system faster and efficient with the help of barcode technology also the industrial work has been reduced. When products are moved from one place to other place the barcode technology helps to take inventory management in better way. After successful use of barcode, company started using barcode on products as well because after using the barcode it became easy to maintain product information in database more effectively.

In 21st century different types of malls and supermarkets came into existence where people went to buy products and also to carry those products in the mall was tedious hence the concept of trolley/cart was invented. Consumer used this cart to add products and checkout through casher.

Types of shopping

- Physical Shopping
- Online Shopping

Physical Shopping

Physical shopping means consumer goes physically into malls for buying products. In physical shopping both the buyer and seller are practically present. Our aim is to modify the existing cart so that time is reduced during shopping. Our proposed system is based on following four different technologies.

- Barcode technology
- WI-FI module for communication
- Android application
- Database at accountant

Online Shopping

Online Shopping means consumer buys products via internet, through call or through some application by just clicking. In online shopping both buyer and seller are not interacting physically. From buying the products to paying the bill everything is online. But online shopping does have some limitations hence maximum people prefer physical shopping.

II. LITERATURE SURVEY

The goal of literature survey is to establish the significance of the general field of study then identify a place where a new contribution could be made. The aim of this survey is to critically evaluate the different methodologies used in the field so as to identify the correct approach for investigating the research question. This includes various papers where new concept and techniques are constantly introduced it is therefore, of interest to analyse the recent trends of this literature. Therefore we have given priority to analyse the literature of the few recent years on the basis of various technologies used. This confirms that the research on the project illustrated is still a growing field, but has reached some maturity.

A. Automated Shopping Trolley using R Pie Embedded Chip

In this an automated shopping trolley is a smart trolley which integrates a raspberry pie embedded chip with two bar code scanner and a battery kit to allow user to self-checkout at super markets. "Intelligent shopping basket" which has a goal to reduce and possibly eliminate the total waiting time of customer. In a world where technology is replacing the ways everyday activity, the future of the retail industry also lies in more and more on automated devices[3].

B. Arduino Based Smart Cart

This is based on the arduino based smart cart. This cart uses RFID technology and arduino. The RFID technology is used for shopping and payment, AVR for peripheral interfacing and record management. This particular system will help the malls to see rise in their purchase and sales along with the customer's records [4].

C. Smart Trolley System using zig-bee

This is based on the "zig-bee" technology which is very advanced technology. Every time the mart customers has to take the trolley and roam here there for collecting the items which takes a lot of time. After collecting all the shopping stuff the customer has to wait in the queue for payment at the accountant section. Due to large queue time is wasted, to overcome this they have developed an smart way of shopping. In this particular technology RFID tag is used by replacing the barcode form the product. The trolley will consist of a RFID reader, LCD screen and the zig-bee module. When a person put any product in the trolley it will scan the product and price and the brand of the product. The addition of price of the entire product will be added to generate the bill. This bill is stored in the microcontroller memory, which then transfers to main computer through zig-bee module [5].

D. The RFID Based Smart Shopping Cart

This is based on the RFID based smart shopping cart. After the wireless technology came into existence, the e-commerce started growing in a faster manner. [4] The growth of e-commerce provides convenience, comfort and efficiency into day-to-day life of customer. In this, they have discussed the concept of RFID which is very new concept. The whole shopping cart is based on the RFID technology. The main goal of this technology is to reduce the long queue at the billing canter. The main focus is to provide assistance in everyday shopping in terms of reducing time. In the RFID based technology the RFID tags was used for maintain the entire database and billing process [1].

E. Analytical Model for Automating Purchases using RFID-enabled Shelf and Cart

RFID (Radio Frequency Identification) technology provides different kind of services and facilities in the business environment. In this the first shelf transistorized with the weight-sensing mat which is integrated with a RFID reader. The second instance is to design a shopping cart which has a tag and a weight-sensing tool, integrated with the RFID reader that can verify the purchase of the items as the items are dropped into the cart. It directly communicates with the database through the server for the purpose of generating bills. Customer prevails the benefits of this particular system as the long queue has been reduced and time efficiency is improved. This system helps retailers to get more additional product details into their mart and track the entire inventory of the mart [6].

III. PROPOSED ARCHITECTURE

Our proposed system creates an automated central bill system for supermarket and shopping malls. Using ABC (automated billing cart), customers do not have to wait in the queue at the billing counter. The system is designed such that products information is transferred to central billing system where customer can pay their bills easily. The system helps in the storage management with an efficient processing of the inventory on every purchase of an item. The smart shopping cart has the potential to make the shopping experience faster and easier. The main objective of this system is to reduce and eliminate time taken at the billing in super markets. This is done by designing an intelligent shopping cart which uses barcode scanner to allow users to self-checkout and increase productivity time. This system contains a barcode scanner which is mounted on the cart. The details about the products that are available in the mall are already stored in their database server.

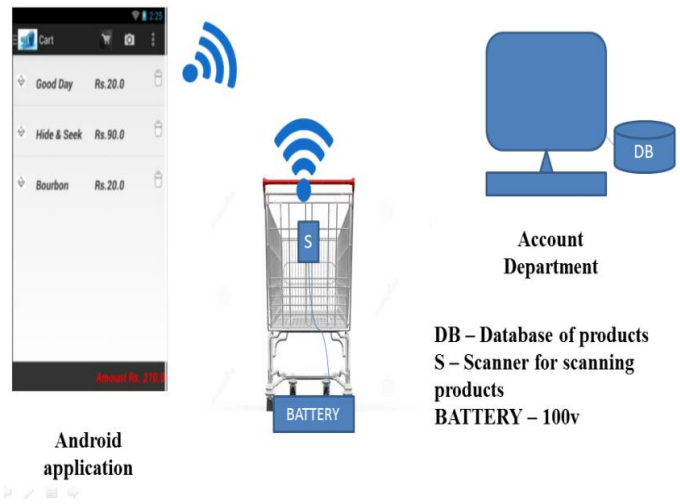


Fig. 1 Architecture of system

Working

A wireless smart-device (scanner) track the records of all the products that are brought i.e. an android application and the accountant system are linked with scanner. The smart cart can be implemented in the following way in the store.

Stage I

Stocks from various suppliers arrive at the store. Products are added to the stock and are registered by using the product registration form, which has detailed information about the product like product_id, product_name, product_price, product_quantity, Brand name etc.

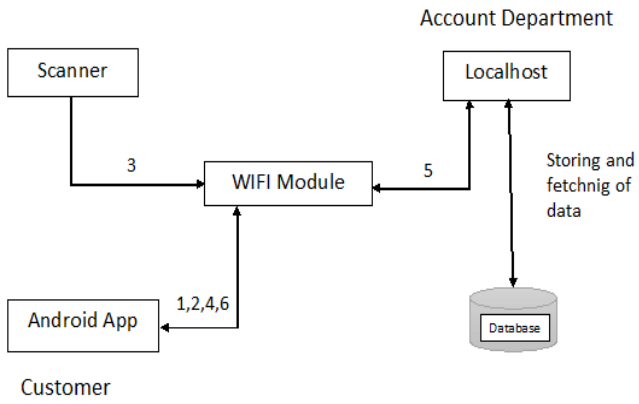
Stage II

The customer arrives at the store. There can be two cases:

- If a new customer arrives to the store then he will move to the user registration counter. User will be registered first then he/she can take the smart cart and start shopping.
- If he/she is an old customer then he/she don't need to register again, they can directly start shopping by smart cart and entering its unique cart identity number into the mobile application.

Stage III

When the customer has done with the shopping, he/she will move forward along with the cart to the billing counter. Accountant does the authentication of the customer by entering the unique cart number and verifies the products that he has brought. A billing detail of the purchased products is automatically transferred to the server. The bill is computed and customer is provided with a facility to remove undesired products.



1. Register and login using mall wi-fi.
2. Unique id is generated for shopping.
3. Start shopping and scanning products.
4. Once the shopping is over go to the bill section.
5. Pay bill and collect the recept.
6. Logout.

Fig.2 Block Diagram

Hardware Requirements:

- Accountant system (PC).
- Android Mobile.
- Scanner.
- Wi-Fi module.

Software Requirements:

- Android Studio.
- My SQL, PHP.
- Wamp server.

IV. CONCLUSIONS

The project successfully demonstrates the possibility of using wireless network as an efficient way for shopping which automates the entire billing procedure. The system is thus highly reliable, fair and time efficient. It is reliable and fair because of the effectiveness of wireless network combined with efficient use of technology. The system is also energy constraint as it uses a passive mechanism. The decision making process is done locally within the cart, thereby eliminating an overhead to the communication between the

nodes. Also, the application does not make use of complex routing mechanisms or uncast transmissions, thus making the implementation simple and fulfilling the aim of minimizing the long queue at billing section.

FUTURE SCOPE

The movement of the cart can be made automatic by making use of sensors. In this way there is no need to pull heavy cart. Cart with LCD screens can be built which displays discount offers and total counting of the products then and there automatically. Also the LCD can be provided with a layout of the shopping market through which the customer can get the exact information of the products present at different places. Thus increasing the user friendliness. The communication medium can be replaced with Li-Fi which covers a large area for transmission of information, making it more efficient.

REFERENCES

[1] Ms. RupaliSawant, Kripa Krishnan, Shweta Bhokre, PriyankaBhosale, The RFID Based Smart Shopping Cart, March-April, 2015.

[2] UditaGangwal, Sanchita Roy, JyotsnaBapat, Smart Shopping Cart for Automated Billing Purpose using Wireless Sensor Networks, 2013.

[3] S. Sainath, K. Surender, V. VikramArvind, J. Thangakumar, Automated Shopping Trolley for Super Market Billing System, (ICCCMIT-2014).

[4] Ashmeet Kaur, AvniGarg, Abhishek Verma, Akshay Bansal, Arvinder Singh, Arduino based shopping cart.

[5] JanhaviIyer, HarshadDhabu, Sudeep K. Mohanty, Smart Trolley System for Automated Billing using zigbee, October 2015.

[6] Vrinda Gupta, NiharikaGarg, Analytical Model for Automating Purchases using RFID-enabled Shelf and Cart,2014.