Smart Trolley System Based on Android

Ms. Neha A Anpat  
UG Student  
Department of Information Technology  
NBN Sinhgad School of Engineering Ambegaon (bk), 411041

Ms. Karuna V Belgudri  
UG Student  
Department of Information Technology  
NBN Sinhgad School of Engineering Ambegaon (bk), 411041

Ms. Rutuja B Deshmukh  
UG Student  
Department of Information Technology  
NBN Sinhgad School of Engineering Ambegaon (bk), 411041

Ms. Mayuri K Shivshette  
UG Student  
Department of Information Technology  
NBN Sinhgad School of Engineering Ambegaon (bk), 411041

Mr. Yogesh J Pawar  
Assistant Professor  
Department of Information Technology  
NBN Sinhgad School of Engineering Ambegaon (bk), 411041

Abstract

E-commerce has become very popular because of recent development in wireless technology and newly invented communication technique. The recently developed technologies leads to comfort, convenience and efficiency in everyday life. In this project we are developing an application which is based on android. In this proposed system the customers have to scan barcode of every product with android mobile which they wish to purchase and drop into the shopping cart and then proceed to checkout at the billing counter. The billing process is quite tiresome and highly time consuming. We have proposed a “Smart Trolley System Based on Android” which aims to reduce and possibly eliminate the total waiting time of customers. Our proposed system takes 5 minutes, lower the total manpower requirement from billing counter and increase efficiency overall.

Keywords: Barcode, Smartphone, RFID, LCD

I. INTRODUCTION

An innovative product with societal acceptance is one of the that aids the comfort, convenience, and efficiency in everyday life. Purchasing and shopping at malls is becoming daily activity in cities. We can see big rush at these malls on holidays and weekends. People purchase different items and put them in a trolley, after completion of shopping, one need to go the billing counter for payment. At billing counter cashier prepare the bill using barcode reader, which is very time consuming process and results in long queue at billing counter. In this paper, we discuss a product "SMART TROLLEY SYSTEM BASED ON ANDROID" being developed to assist a person in every day shopping in terms of reduced time spent while purchasing. Low cost, easily scalable and robust system for assisting shopping to the customer. In modern era, when the customer want to purchase an item then customer has to click a picture of barcode. After scanning barcode we are using an algorithm called as RGB to Gray scale. After words then corresponding data regarding product will be displayed on customers smart phone screen. As we put the product the cost will get added to the total bill. Thus the billing will be done in application itself. At the billing counter the total bill data will be transferred to server side PC by proposed system. Static map given in the proposed system will locate the product present in the mall with sectional specification for the ease of customer. By using this system, customer can buy the large number of product in very less time with less efforts. At the billing counter computer can be easily interface for verification and bill printout.

II. RELATED WORK

In existing system, when a person goes for shopping in any mall then he take trolley and after complete shopping he has to go to counter for billing. Billing is done using barcode reader. It takes lots of time to complete the 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 manpower to scan the label manually. It is not possible to read the barcode from long distance. Environmental changes can damage the barcode. So our aim is to design automatic billing system which is based on RFID (Radio Frequency Identification) technology. In this system, items are attached with RFID tag. RFID tag will be read by RFID reader which is attached on trolley. Item information will be sent by reader to micro-controller then further information will be sent to central server using Zig-Bee micro-controller. Server will calculate the bill and it is displayed on LCD which is attached on trolley. So RFID tag can be read from long distance. Hence the time required for billing is less.
Hardware integration, software interface, wireless communication and network database are the four main elements used in this paper. A microprocessor with an LCD, a wireless card, barcode reader, and a portable battery are used in this design. The barcode reader will be used to scan the items, and the Wi-Fi card will be used to connect wirelessly to the store’s database. The device can be removed, so that it can be used from one cart to another. For ease of customer the design includes external speaker with voice prompt which is available on LCD screen. To keep small efforts in data addition some adequate measures are necessary to constantly increase wiring the sensors? Concerning the cost and complexity of a data acquisition system, a wireless sensor network seems to be a convenient option. For this function, wireless network standard ZigBee is appropriate. An RFID reader was also installed on the shopping cart to record product related events. [2]

In this paper, the system uses microcontroller, because microcontroller based system are less bulky and also easily transferable. Power requirement in this system is less. Hence the system is cost effective. It is easy to fit in robot as it requires less space and easy installation. Barcode scanner:-In barcode black and white strips are present. All light transmitted by transmitter are absorbed by black strips and are not reflected back. Light rays are reflected due to white strips. This is the basic principle of barcode scanner. At the transmitter section the control signals are transmitted using radio frequency. Control signals are serially transmitted. At receiver section these signals receive and decoded. [3]

Now days purchasing and shopping at big malls is becoming a daily activity. We can see huge rush at malls on holidays and weekends. The rush is even more when there are special offers and discount. After purchasing the particular product people put them in trolley. After total purchase one needs to go to billing counter for payments. At the billing counter the cashier prepare the bill using barcode reader which is a time consuming process and results in long queues at billing counters. Our aim is to develop a system that can be used in shopping malls to solve the above problem. 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 product is dropped in the trolley, detection of code will take place and the price of those products will be stored in memory. The cost will get added to total bill whenever the product is added to trolley. Hence the billing will be done in the trolley itself. Description of product 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 [4]

III. EXISTING SYSTEM

The system which is recently in work uses barcode method. The customer select the items he wants to purchase then he has to go to the billing counter, the employee of mall will scan the barcode present on every product of each customer. This makes other customers to wait in a queue for longer time, which makes the shopping process very time consuming and frustrating. On the days of special discount and weekend the mall has to increase billing counter to manage the increasing crowd from the billing queue. Nowadays when customer wants to buy product from discounted offer because of misunderstanding of offers given by the mall he will get confused at counting the total bill before he reaches to the billing counter. After decision of product which customer wants to buy he has to search for the product in the sectional arrangement of product provided by the mall. Sometimes it is impossible to know the sub categories of the product available in the mall.
IV. PROPOSED SYSTEM

A. Block Diagram

![System Block Diagram](image)

**Fig. 1: System Block Diagram**

B. System Architecture

![System Architecture](image)

**Fig. 2: System Architecture**

The Automated Shopping system integrates a Shopping application with two sets of barcode that is barcode scanner and barcode generator placed at two different checkpoints – the entry and exit points respectively. It facilitates the user to self-scan the barcode of the purchased products which he intends to purchase. A wireless smart-phone makes note of all the scanned commodities of the particular application and is linked with the mall's backend database which contains details of the products.
such as Cost Price, Available Stock, discounts and description of product, etc. The scanned products are automatically billed in the wireless smart device for their purchases, the total bill will be displayed on users smartphone thereby significantly reducing turnaround time and transmitted to the mall's central Billing program. This allows users to take out all their products which they scan, to the billing counter after that cashier will verify the bill and billing process will be done in short span of time, and the remaining thing is just to collect the product and proceed to the checkout point.

**C. Flowchart**

![Flowchart of System](image)

**D. Algorithm**

1) Step1: Start
2) Step 2: Login
3) Step 3: Add List
4) Step 4: Scan Barcode
5) Step 5: After scanning ,fetch product details from database
6) Step 6: Display product details on screen
7) Step 7: Add product cost as product is added
8) Step 8: If product is removed display message "ADD" or "REMOVE"
9) Step 9: If product is removed update list and show the reduced bill on screen and if not bill will be same
10) Step 10: Submit data to mall server
11) Step 11: Bill generation
12) Step 12: Stop
E. System Flow

1) Customer login.
2) Add list to the system.
3) Customer has to scan the barcode of each product he wants to buy, by clicking picture of barcode through his smartphone.
4) When barcode of product is scanned it fetches product’s name, cost and other details from the database and details are displayed on the screen.
5) If user wants to remove any of the product from the list then he has to select the product and press the remove button, then his list will get automatically updated and product gets removed and the cost will get displayed on the screen and also this changes will be monitored by the mall server.
6) When this process gets completed customer has to submit final data to the mall server.
7) Bill will get printed and copy will be sent to customer.

V. CONCLUSION AND FUTURE SCOPE

This system is most certainly a definite necessity for the retail marketing industry to step up their portfolios and cope up with the advancement in technology. It also saves time and manpower. The Smart System was designed to function as a mobile self-checkout system providing users the flexibility to make transactions from it within the retail store. It is designed to be highly efficient and fully synchronised with the retailer’s current system.

The transaction and billing system can be linked with bank account of individual user and the system can be further designed to search products in mall and guide the user accordingly to the position of the exact product.

REFERENCES