Abstract

This paper presents a novel method of collaborating ease in online shopping and the sense of security money wise as well as for customer satisfaction while doing shopping offline. This is implemented using a phone application and location beacon. In Offline mode, the customer needs to pick the product from racks, carry cash, credit/debit cards along with them and wait in the long queue to make payments. Items already placed in list of the application will be displayed on map of supermarket with shortest traced path. Users have to scan the barcode of the product before placing in trolley application mentioned here. 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 ongoing offers in the store. Payment can be according to customer convenience.

I. INTRODUCTION

From past 2 decades, use of mobile devices has greatly increased, that has led to ease of carrying out day to day activities. Nowadays, wireless networks have taken over the entire world. Business and financial transactions can now be done easily and securely, anywhere and anytime. Using Internet, connections can be established with any devices almost anywhere in the world and can share necessary information amongst them. The daunting tasks faced in daily lives can now be accomplished by few of clicks on our Smartphone.
1.1 Traditional Shopping

Traditional shopping 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. [4] 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 traditional shopping, the customer has to wait in long queues at the cash counter. The cashier scans barcode 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 barcode using his mobile while making purchase, retrieve essential details of all products from shop’s database and generate bill himself. This bill can be sent to the cashier’s computer using web service. Thus the user can make quick payment at the counter and leave the shop early.

1.2 Android

![Android Software Environment](image)

Figure 1: Android Software Environment

[6]Android is an operating system developed for smartphones and tablets. It is based on Linux kernel and uses Dalvik Virtual Machine (DVM) for executing Java byte code. Absence of GNU C Library and some functions differentiate it from being Pure Linux. Android’s source code is released by Google under open source licenses.

Some features of Android are:

- Highly customizable nature
- Reasonable Price
- High degree of ease due to presence of PC like apps.
- Hardware and Software features
- Full control over OS.

Android software environment consists of:

- Linux kernel
- Libraries and Dalvik Virtual Machine
- Application Framework
- Applications (built-in and custom)
1.3 Estimote Indoor Location

Building the next generation of context-aware mobile apps requires more than just iBeacon™ hardware. Developers need smarter software: tools that give them control over proximity and position within a given space, without unnecessary hassle. Estimote Indoor Location does just that. It makes it incredibly easy and quick to map any location. Once done, we can use this SDK to visualize approximate position within that space in real-time, in your own app. Indoor Location creates a rich canvas upon which to build powerful new mobile experiences, from in-venue analytics and proximity marketing to frictionless payments and personalized shopping.

II. LITERATURE SURVEY

The retail industry has been advocating “Smart Shopping” for many years by adopting various technologies to enhance the shopping experience at the retail environment. The vision of smart shopping promises is to provide on-the-spot information about various discounts, schemes, etc. at your fingertip.

The advantages of mobile commerce are:

- Cost savings
- New business opportunities
- Time saving
- Allow for considerable profit
- Improvement of Customer relations

While coming across various technologies such as Online Shopping, where items are purchased online through various websites, the drawbacks encountered were –

- Fraud
- Shipping cost
- Deprives our Tangibility
- Lack of Options

In traditional shopping method various difficulties faced are- • Long queues

- Huge waiting time
- Carrying heavy items home

This paper assumes that the application described would be a prototype that would shape the future & there still remains much to do in terms of development and improvement of the existing models. Applications created with ease of understanding and the design can be created and tailored to the shopping process to make it more effective and user friendly, thus making it easier & convenient for the users to do the entire shopping process with the use of this application.

Sanga son and Yongtae Shin proposed ‘shopping application using barcode scanning’. This paper intends trolley which is able to add products into mobile shopping cart by scanning the barcode through smartphone camera and places order in online store.
Megha R. Mane, Nilam G. Amane and Sunita D. Patil proposed ‘Electronic shopping using Barcode scanner’. This is equipped with Barcode Scanner for product identification and consistent wifi connection with shop’s server. It also has LCD display that informs customer about product prices, discounts offers and total bill.

Ramakanth Putta, Manoj Misra and Divya Kapoor proposed ‘Smart phone based indoor tracking using indoor maps’. Tracking targets user’s indoor location with sub meter accuracy using low cost system. This project uses inertial sensors, magnetic field maps and indoor maps in a particle filter based implementation to improve accuracy of localization and tracking. The best approach achieves a mean localization accuracy of 0.50m with standard deviation of 0.25 m.

### III. PROPOSED WORK

#### 3.1 Software

In the proposed work, the user will scan the item which he wants to purchase with the help of scanner provided by this app. After scanning of the item a web service will get called which will create a connection with the database of the shop. As the connection is established, the user is now synched with the database and information related to that item is provided to him. In this whole procedure the overall time of scanning of individual items is saved and thus reducing the time of the shopping. The assumptions for the app are-

- Shop has Wi-Fi facility
- User has installed the app

#### 3.2 Hardware

Mobile phone- smart phone having facility of bluetooth and running desired application

Bluetooth module- used to connect smart phone and microcontroller placed in Trolley

Microcontroller- assembling every component and form the desired output
• **Counter** - making the count of product placed in trolley IR sensors is used

• **Motor driver** - driver IC used for driving voltage to motor

• **Obstacle Detection** - senses the upcoming obstacle between the path

Sensor(ODS)

### IV. IMPLEMENTATION

#### 4.1 Hardware Implementation

To have a self sustaining and hasselfree shopping experience to the customer some external peripheral devices are implemented which improve the quality of service

![Image of hardware implementation](image)

Anti-theft Exit:

As the user finishes up with the shopping, the system cross examines the products picked by two methods:

1. Total number of product count in trolley should match with the total number of products counted by using ultrasonic sensor in the trolley.

2. A weighing machine is placed under the floor at exit point. As soon as trolley passes over it, the total weight of trolley is examined. This weight is cross checked with the total weight of products scanned. These weights will be approximately equal for correct shopping.

If both of the above conditions are satisfied the user gets to exit the supermart.

#### 4.2 Software Implementation
Aditya Pratap Singh, Belorkar Vishwjeet, Kumbhare Shweta Choudhari Rupali :: Smart Mart Implementation using a Phone Application and Location Beacon
V. CONCLUSION

As the demand for the online 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. With camera feature in it, the user can scan the barcode of the item to be purchased and then directly add it into the cart. There are two 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 online shopping. 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.

VI. REFERENCES


TO CITE THIS PAPER