Smart Shopping Application using NFC

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Abstract - *This paper presents an alternative method of doing shopping easily as well as providing security money wise for customer satisfaction. This is implemented using android which supports NFC. In traditional way customer needs to physically purchase his product, carry cash or card along with them and wait in long queue for making payment. The application would read the product id of the product assigned in the NFC and add it to the cart in the application. The quantity of product can also be changed so the list can be edited. E-wallet facility will be given for making payment. It will also provide OTP to the customer for secure money transactions.*

Key Words: Android, NFC, E-wallet, OTP, Card.

1. INTRODUCTION

Mobile commerce is the buying and selling of goods and service through mobile phones and tablets. It has become new generation's e-commerce M-commerce enables doing transactions via digital means: Financial and business transactions can be done easily with security anywhere and anytime. The intimidating task of daily life can now be perpetrated by few clicks on our smart phone.

1.1 Traditional System

   Traditional system is a time consuming job. Sometimes the mode of payment is not accepted in traditional system customers have to wait in long queue for payment purpose at cash counter. This consumes lot of time and energy of both cashier and customer. Online shopping seems to provide extra convenience while traditional shopping provides greater comfort factor. Online shopping is not always safe to make an order online you have to expose personal data and credit card information hackers can access personal information easily through online transaction and steal it for unauthorized deals. The project aims at removing inadequacy of both traditional and online shopping.

   The waiting in long queue at the cash counter can be overcome, the customer can scan the NFC card attached to the product using his mobile phone and while purchasing get essential details of products and generate bill by themselves. The bill will be sent to cashier's computer using web service. The security and safety of user's information can be entertained by providing OTP on customer's mobile phone. The user can make quick payment and leave the shop early.

1.2 Android

   Android is a software stack for mobile devices that includes an operating system, middleware and key applications. Android is a software platform and operating system for mobile devices based on the Linux operating system and developed by Google and the Open Handset Alliance.

Some features of android are:

- Multilanguage support and Multitasking
- Bluetooth, Wi-Fi, GPRS technology
- Media support for common audio, video, external storage and image formats.
- Messaging: SMS, MMS
- Wireless app downloads, automation, custom Home Screens, Widgets and Alternate Keyboards.

1.3 Near Field Communication (NFC)

   NFC or Near Field Communication is a short range high frequency wireless communication technology. NFC is mainly aimed for mobile or handheld devices. NFC is an extension of Radio frequency identification or RFID technology. Its working distance is up to 10 cm. It operates within the globally available and unlicensed radio frequency band of 13.56 MHz, with a bandwidth of 14 kHz. It allows communication between two powered (active) devices and non self-powered (passive) devices for simplified transactions and data exchange.

Fig-1: Applications of NFC

2. LITERATURE SURVEY

From last few years, the industries have been adapting to "Smart Shopping" by using latest technologies to enhance shopping experience. The advantages of mobile commerce are:

1. Customer gratification
2. Cost effective
3. Time savings
4. Greater business opportunities
5. Enhancement of customer relations

When customers purchased products through online websites, they experienced various drawbacks:

1. Fraudulence
2. Cost of shipping
3. Availability of less options

In conventional shopping method various issues faced are:

1. Long queues
2. Tremendous waiting time

Survey was conducted at three shops:

1. D-Mart
2. Big Bazaar
3. Reliance fresh

This paper concludes that application would create a prototype that would shape the future but still there remains much to do development and improvement of existing models.

3. PROPOSED SYSTEM

In the proposed method customer will do the shopping with NFC enabled mobile phone. The customer should scan the products which he wants to purchase by tapping the mobile phone on NFC card attached to the product. The connection will be established with the database of the shop and the information related to the product will get displayed on the application customer is able to do payment through his mobile phone without waiting at the cash counter for the proposed system to be in effective the necessary assumptions are:

· Internet facility in the shop
· App installed on customer's mobile phone

The performance parameters for whole procedure are time spent in the mall, correctness and accuracy of product information and speed of internet in mall.

3.1 Web Service

Web service is used for connectivity any device with any other device with active internet. HTTP protocol is used for communication. In this proposed method web service is needed to establish communication between mobile

phones and mall's database to get information of product, customer details and payment details.
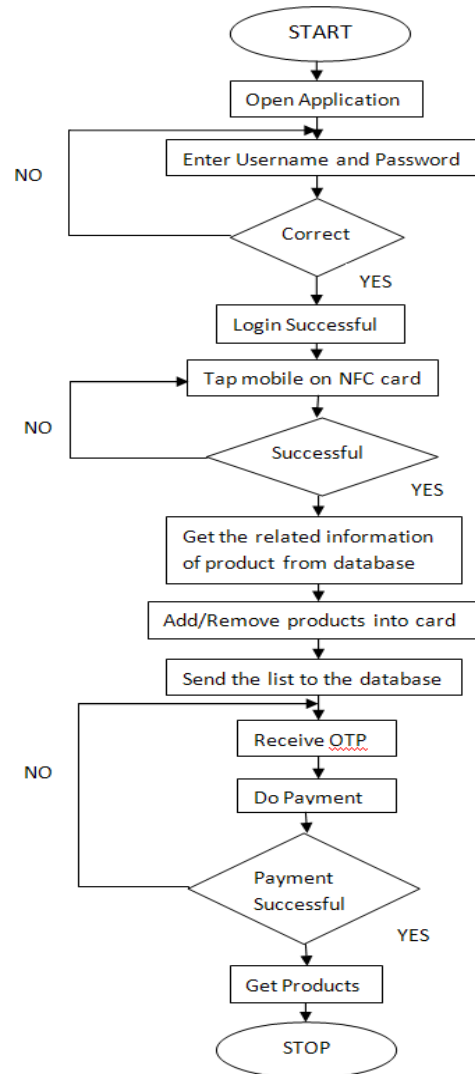

Fig -2: Flow Chart

3.2 Database

The system's database consists of following tables:

· Product: It provides detail information about its product id, product name, mfg date, exp date, price, etc.

· Admin: This table will have information about admin id, admin name and login id.

· Customer: This table maintains customer id, customer name, their email id and mobile no.

· Store: This table maintains store id, store location, product id and product name.

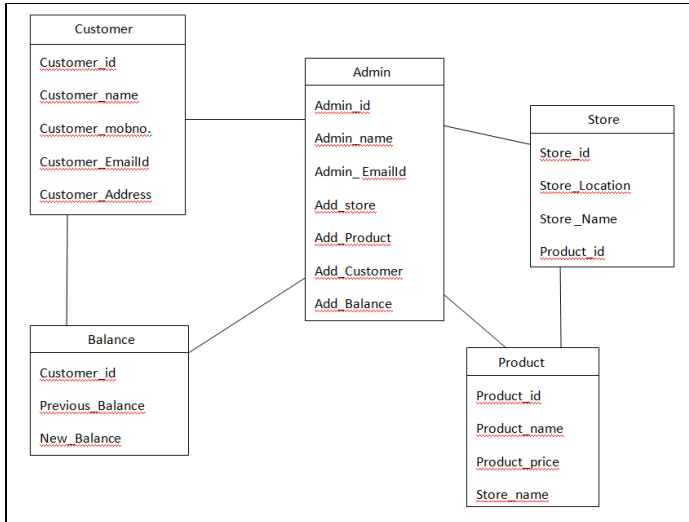· Balance: It provides information about previous balance and updated balance of customers.

Fig -3: Schema of the Database

Working of the Project:

· Customer will open application when reached at mall.

· Malls will be having products with attached NFC card.

· For purchasing the product customers will tap on the NFC card placed on the product with their mobile phone.

· The details of the product will be displayed on customer's mobile phone.

· The customer will enter the quantity they want to purchase and can also view list of all products with price that have added in cart.

· The customer will make the payment by e-wallet.

· Order will receive at admin side and then he will deliver product manually.

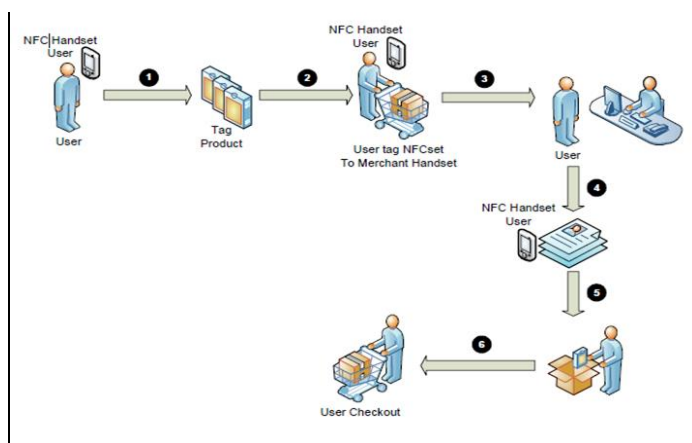· Admin will also recharge customer's account as per their request.

Fig -4: Working of the project

4. IMPLEMENTATION DETAILS

4.1 Application Features

Smart Shopping app has following features:

· Reduces scanning time
· Personalization of items
· Maintains History of purchased products
· Provides information regarding Discounts and Offers

4.2 Technologies used

Hardware Requirements:

· Intel processor i3 and above
· 4 GB RAM
· NFC card
· Android mobile that supports NFC

Software Requirements:

· Android Studio 2.3.3
· Windows Operating System
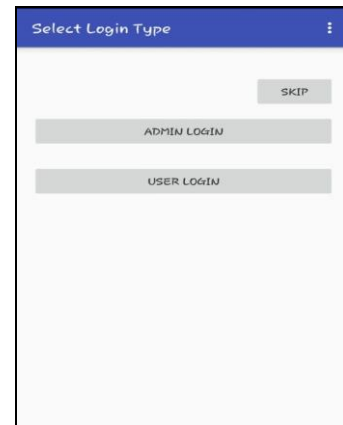· XAMPP, HTML, PHP, MYSQL
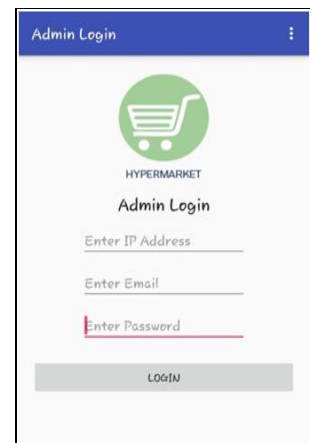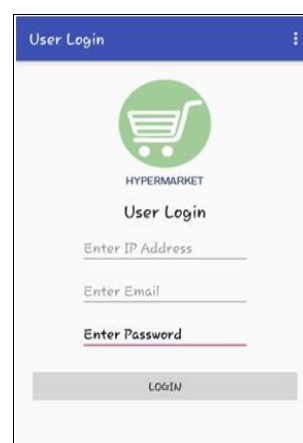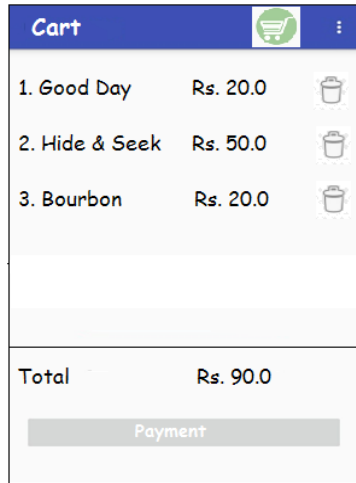

Fig -5: Login Page

Fig -6: User and Admin Login Page

Fig -7: Payment Page

5. CONCLUSION

NFC has the shortest range among radio frequency technologies but it is revolutionary due to its security, compatibility, user friendly interface and immense applications. The demand for online shopping is also increasing so there is an extreme demand of more safe and secure transactions. Our application is for NFC enabled mobile users who do not want to carry cash and does a struggle free shopping. The time required for purchasing and billing will be reduced. The transactions that will take place will be secured by providing OTP. At the moment, the only issue with our approach is in a low number of NFC enabled mobile phones. More development and improvement can be done in existing system in future.

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