

“SMART ELECTRONIC-BILLING”

Synopsis Report

Submitted in partial fulfillment of the requirement of University of Mumbai

For the Degree of

Bachelor of Engineering

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Project I Approval for Bachelor of Engineering

Chapter 3

This project I entitled ***Smart Electronic Billing*** by ***Muqri Hamza, Rangari Nabeel, Shrivias Saurabh, Usmani Sahil*** is approved for the degree of Bachelor ***of Engineering in Department of Computer Engineering.***

Examiners

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Date:

Place:

Project Title: Smart Electronic Billing

Abstract: In recent trends, Customers prefer to do online shopping though more than 50% of the customers are not satisfied in quality, size and worthiness of the products. For touch and feel satisfaction, choice of items customers wanted to go for direct shopping comparatively. Even in direct shopping, Customers feel hard to buy large number of products as it is difficult to carry the items throughout the shopping. Billing process consumes more time especially during the weekends and results to loss of patience among customers. Thereby introducing a new methodology here which overcomes the drawbacks mentioned in direct shopping.

This methodology is the smartest way of shopping where the customer can choose the product directly based on the quality and the size by scanning the bar code on the price tag of the product via mobile application. This eliminates the carrying of items throughout the shopping. This will also provide an easier way of billing the items using the mobile application. Billing is made easy as this process does not require manual/traditional way of cash payment. Thus this methodology not only comforts the customers but also the merchants as it provides a trouble-free approach for shopping.

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Glossary of terms used

A

Application : A formal request to an authority for something

Activity : a specific deed, action, function, or sphere of action

Architecture : The art or practice of designing and constructing buildings

B

Barcode : optical machine readable representation of data

Billing : use to calculate purchasing goods of customer

E

Events : A planned public or social occasion

Eligible : fit or proper to be chosen; worthy of choice; desirable

F

Feasibility : to see if the project will serve purpose on completion

Functional Requirement : defines function of a software components

L

Literature : Written works, esp. those considered of superior or lasting artistic merit

M

Modules : An independent self-contained unit of a spacecraft

O

Over : Extending directly upward from

Organizers : A person who organizes

P

Pay : The money paid to someone for regular work

Principle : A fundamental truth or proposition that serves as the foundation for a system of belief or behavior or for a chain of reasoning

Q

Queries : Ask a question about something, esp. in order to express one's doubts about it or to check its validity or accuracy

T

Testing : a test engineers take while testing

Declaration

We declare that this written submission represents my ideas in my own words and where others' ideas or words have been included, I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my submission. I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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Chapter 1

Introduction

Manual Shopping is the traditional way of shopping where the customers choose their wished product and carry the products along with them. This leads the customers to feel the physical pain. Even though online shopping is more now-a-days, customers always feel to purchase the product by directly as there is lack of security mechanisms. Due to the tremendous change in technology & generation smart phones will play important role in online shopping.

This facility makes the customer to purchase products irrespective of location and cash on hand. In that case, possibility of shopping may increase without a wallet. Thus this paper proposes a method which could overcome the difficulty of payment using mobile banking. The Barcode of the product is scanned by the customer and move to the wish list if they are interested in choice of item by using the proposed mobile application. The wish list which represents the list of items to be purchased and it can be confirmed once the items are finalized. The confirmed items are notified to the merchant and the bill is generated to the respective user's mobile phone.

Authentication where which may not support information security and mobile network issues. Thus a security mechanism is proposed here to overcome the drawbacks of payment through mobile phones. The products could be purchased even without customer mobile phones as the shop is to be provided with the temporary phones which has an application of scanning the.

1.1 Existing System

In the present world, the item to be purchased from the shop is a tedious process, as it involves the process also time consuming. Once the product is chosen, the product is to be carried to the billing section and each product is to be scanned using bar code. In the current fast growing

technology, bar code is the method used to scan the product as it gets the information about the product. This is easier way to fetch the details about the product but there is only little information provided than detailed information as it covers only one-dimensional data. The payment for the product is done by either cash or credit system. There are so many rush when week end or holiday so costumer need to wait lots of time.

1.1.1 Disadvantages of existing system

1. Process consume lots of time
2. First costumer need to scan all Barcodes in counter
3. After Scanning process calculation part is done

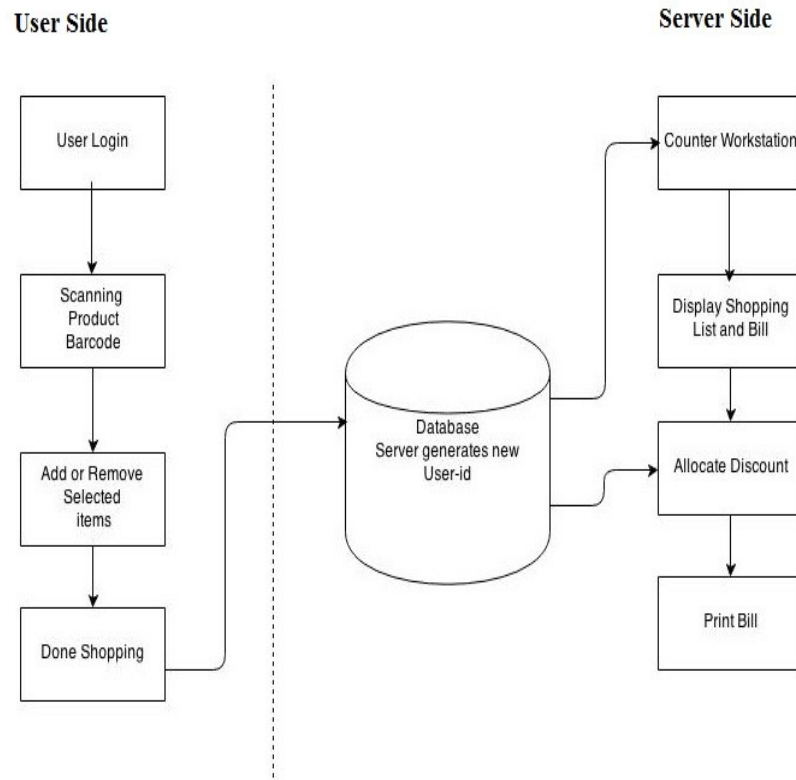
1.2 Proposed System Architecture

This paper proposes the methodology to overcome the issues faced in the real-world. The system introduces a way to choose the product. The detailed information about the product shall be fetched using Barcodes as it is of two- dimensional data. A wish list shall be generated by the customer and it is confirmed later. User can update or remove items form cart. After user can send wish list to server end calculation of bill will be done by system. After easy verification user can pay bill. Its time saving process no need to stand in long queue.

1.2.1 Advantages of Proposed system

1. User save time
2. User can manually check product so user are far away from online shopping scam
3. No need to stand in long queue
4. Proper use of technology

1.3 Architecture diagram



1.4 Scope of Project

- a) Reduction in hardware costs for the retailer
- b) Better shopping experience for the consumer
- c) Decrease waiting time at the cash register
- d) Better targeted promotional activities

1.4.1 Motivation

In recent trends, Customers prefer to do online shopping though more than 50% of the customers are not satisfied in quality, size and worthiness of the products. For touch and feel satisfaction, choice of items customers wanted to go for direct shopping comparatively. Even in direct shopping, Customers feel hard to buy large number of products as it is difficult to carry the items throughout the shopping. Billing process consumes more time especially during the weekends and results to loss of patience among customers

The motivation is to software make customers more mobile by adopting new technology that keeps customers shopping in-store. The motivation is to build a concept to increase use of the customers' own device in their shopping journey. Consumers rely on smartphone technology for researching and comparing products with access to QR readers to help find items online

The customer will use their own smartphone or tablet to take control of their in-store shopping experience; a concept truly set to change the retail environment. They can purchase goods for them using their smartphone or tablet.

The motivation is to decreased waiting times - by pre-scanning their shopping customers can save time at the checkout and increase targeted Marketing - retailers can use this as a platform to promote offers and generate cross selling opportunities

1.5 Formulation of Problems

a) **Personal Information Gathering (Registration):**

The work here starts during the first time installation of our application. It gathers the basic customer information like first name, last name, date of birth, city, state etc., and it will be stored into user mobiles, SQLite database for registration purpose. So every time when the user buys the ticket this customer information is also sent to the database for security purpose and used also in the Barcode generation.

b) **User verification**

With a use of this module we are going to authenticate user using MySQL in back end

c) **Barcode scanning**

In this module we scan Barcode and extract all data from Barcode and store it in our cart by one by one. This data is also useful to generate use bill.

d) **Data passing to server**

In this module we are going to send stored data to server end for verification process. And bill generation

e) **Applying K-clustering for discount generation**

We going to use k-clustering algo for user discount generation first we going to check user's total visit and buying items rate and generate appropriate discount to user.

Chapter 2

Review of Literature

2.1 History Of Billing System

Many Supermarkets use this type of billing system for a decade. It is also improved many times according to requirements of sellers and customers. It does the same work that is calculating the bill, gives it to the customer and maintain proper database. They are accurate in calculation and printing, they also generate records. A new concept is also added in the billing system is that they also maintain relationships with the customers who purchase more products from the store regularly. System also concerns their requirements and gives them more commission. It also shows the overall profit and profit on a particular product and give reports which items are required and which have cross their expiry date.

Supermarket is the place where customers come to purchase their daily using products and pay for that. So there is a need to calculate how many products are sold and to generate the bill for the customer. First is the data entry operator who will enter the products in database. Second one is the administrator who will decide the taxes and commissions on the products and can see the report of any product. Third one is the bill calculating operator who will calculate the bill and print. The new system should concern the requirements of the customer and the sellers. It has the following qualities.

Reduction in processing cost, Error reduction, Automatic posting, Improve reporting, Automatic production of the documents and Reports, Faster response time.

Chapter 3

A barcode system in a supermarket is a system that allows you to efficiently manage your inventories in a store, track your goods within the store, and make correct decisions based on your current stock that you have. In case of a supermarket, a barcode can make the running of a supermarket easier. This is how it works, normally I presume you've seen how it works in a supermarket.

A customer walks into a supermarket, picks some items and shows it to the cashier. The cashier takes the items, shows the barcode on the item to a device (barcode scanner), the system calls up the product, item number, price and other information related to the item and notes it. The cashier shows the other items to the system and the system calls up the product in that manner. After the cashier has shown the last item to the scanner, the total cost is displayed on the screen, the cash drawer is opened and receipt is generated automatically, and the system records the transaction against the account of the cashier that completed the transaction. The manager just connects to the database and reviews the transaction summary performed by his cashiers.

2.2 History Of Mobile OS

Operating system is the heart of mobile devices, which controls and interacts with the mobile hardware. Similar precept to an operating system such as Windows, Mac OS and Linux, that controls the desktop or laptop. Devices which run on operating systems are smart phones, PDA's and tablet computers. Everyone wants to do everything fast and on the go. When people were sitting back and idling with the heavy computers for accessing the internet.

An operating system called Palm OS was launched in year 1996 which brought a drastic change in the communication world. With the introduction of Palm OS 2.0 in the year 1997, accessing and sending mail via mobile evolved. The time when Palm OS was standing alone in the Smart phone market in the year 2000, another giant bounced into the market, introducing Windows "Pocket PC 2000" which almost had most of the features of a computer.

Entertainment on the go was achievable with Windows by launching "Pocket PC 2002" which incorporated MSN messenger and media player with enhanced user interface. Bluetooth an extraordinary invention for file transfer wirelessly. Bluetooth integration was successfully implemented in Windows Mobile 2003 and browsing was made more comfortable with the pocket internet explorer. When Windows were acquiring the smart phones market, Palm OS Cobalt bounced back with Wi-Fi and Bluetooth connectivity in 2004.

In 2005, Google acquired the Android Inc and Blackberry's OS 4.1 was made available in the market. Windows interfaced the GPS management and office mobile in their "Windows

mobile 5". When everyone was going upwards in updating the version and integrating application in the smart phones. The release of "iPhone" in 2007 disrupted the mobile industry and gave a new era of smart phone operating system with user experience which relies on touch based user interaction.

In 2007, a trendsetting year when Google formed the OHA with 79 other hardware, software and telecommunication companies to make entry in to the smart phone market by introducing a legendary open source operating system "ANDROID" resulted in 2008 with Android 1.0 which was available in the market. Android came up with a middleware which is responsible for hardware and communication between applications, and provides open source Android SDK application that allows embedded systems developers to use it to develop their own customizable Android platform applications. Some notable top applications such as Google map, E-mail, Instant messaging, Browser, GPS, Multimedia messaging are widely made available to the people in large only because of Android. The enhancing grandness of smart phones has sparked off intense contenders amongst software giants such as Google, Microsoft, and Apple, as well as mobile industry leaders Nokia, RIM, and Palm to keep on updating their technology.

In 2009, Samsung too joined the roads of smart phones when they released a new operating system called as BADA platform. Nevertheless Hewlett Packard Web OS was also introduced in the same year. But Google's Android was claiming so high in a year, they acquired the major share in the smart phone operating system by upgrading from Android 1.0, 1.1-1.6 till 2.1 (Éclair) and version 3.1 (Honeycomb) was released in 2011.

2.2.1 What is Android?

In 2005, Google acquired Android from Android Inc. which was found in year 2003 by Andy Rubin and they dealt with developing software for mobile devices. Later, OHA which comprises of 79 companies along with Google developed their new mobile platform for mobile devices. This alliance was formed so as to develop open technologies for mobile devices and make those applications easily available in the market. This new open source technology was named as Android. Android is an open source architecture which is used for developing applications for mobile devices. Android works on Linux Kernel. It has an operating system, middleware and key applications. Android announced its code under the license of free software/open source in the year 2008. Android comes up with an API for mobile devices. This Linux Kernel supports Java Virtual Machine which favors Java to be most suitable programming

Language for development of the applications. Google provides a SDK to all developers which include libraries, debugger and a handset emulator in Eclipse IDE [5, 6]. The application which is developed in Android can be tested using this emulator which works similar to a mobile phone.

2.2.2 THE GROWING IMPORTANCE OF ANDROID MOBILE

Android is a software stack for mobile devices that includes an operating system, middleware and key applications. The Android SDK provides the tools and APIs necessary to begin developing applications on the Android platform using the Java programming language. It is a Linux-based operating system for mobile devices such as Smartphone's and tablet computers. It is developed by the Open Handset Alliance led by Google.

Android has a large community of developers writing applications ("apps") that extend the functionality of the devices. Developers write primarily in a customized version of Java. Apps can be downloaded from third-party sites or through online stores such as Android Market, the app store run by Google. As of October 2011 there were more than 400,000 apps available for Android, and the estimated number of applications downloaded from the Android Market as of December 2011 exceeded 10 billion.

2.2.3 FEATURES:

- a) Application framework enabling reuse and replacement of components.
- b) Dalvik virtual machine optimized for mobile devices
- c) Integrated browser based on the open source Web Kit engine.
- d) Optimized graphics powered by a custom 2D graphics library; 3D graphics based on the OpenGL ES 1.0 specification (hardware acceleration optional).
- e) SQLite for structured data storage
- f) Media support for common audio, video, and still image formats (MPEG 4, H.264, MP3, AAC, AMR, JPG, PNG, GIF)

2.3 Barcode

A **barcode** is an optical machine-readable representation of data relating to the object to which it is attached. Originally barcodes systematically represented data by varying the widths

and spacing's of parallel lines, and may be referred to as linear or one-dimensional (1D). Later they evolved into rectangles, dots, hexagons and other geometric patterns in two dimensions (2D). Although 2D systems use a variety of symbols, they are generally referred to as barcodes as well. Barcodes originally were scanned by special optical scanners called barcode readers. Later, scanners and interpretive software became available on devices including desktop printers and smartphones.

They come to us from Japan where they are very common. Barcode are used to take a piece of information from a transitory media and put it in to your cell phone. You may soon see Barcodes in a magazine advert, on a billboard, a web page or even on someone's t-shirt. Once it is in your cell phone, it may give you details about that business (allowing users to search for nearby locations), or details about the person wearing the t-shirt, show you a URL which you can click to see a trailer for a movie, or it may give you a coupon which you can use in a local outlet.

The reason why they are more useful than a standard barcode is that they can store (and digitally present) much more data, including url links, geo coordinates, and text. The other key feature of Barcodes is that instead of requiring a chunky hand-held scanner to scan them, many modern cell phones can scan them.



Figure 2.3.1 Barcode

Chapter 3

Description

3.1 Detailed Analysis and Description of project

3.1.1 Android

In 2005, Google acquired Android from Android Inc. which was found in year 2003 by Andy Rubin and they dealt with developing software for mobile devices. Later, OHA which comprises of 79 companies along with Google developed their new mobile platform for mobile devices. This alliance was formed so as to develop open technologies for mobile devices and make those applications easily available in the market. This new open source technology was named as Android. Android is an open source architecture which is used for developing applications for mobile devices. Android works on Linux Kernel. It has an operating system, middleware and key applications. Android announced its code under the license of free software/open source in the year 2008. Android comes up with an API for mobile devices. This Linux Kernel supports Java Virtual Machine which favors Java to be most suitable programming Language for development of the applications. Google provides a SDK to all developers which include libraries, debugger and a handset emulator in Eclipse IDE [5, 6]. The application which is developed in Android can be tested using this emulator which works similar to a mobile phone.

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Chapter 3

Android, and the estimated number of applications downloaded from the Android Market as of December 2011 exceeded 10 billion.

Android provides a rich application framework that allows you to build innovative apps and games for mobile devices in a Java language environment. The documents listed in the left navigation provide details about how to build apps using Android's various APIs. Android apps are built as a combination of distinct components that can be invoked individually. For instance, an individual *activity* provides a single screen for a user interface, and a *service* independently performs work in the background.

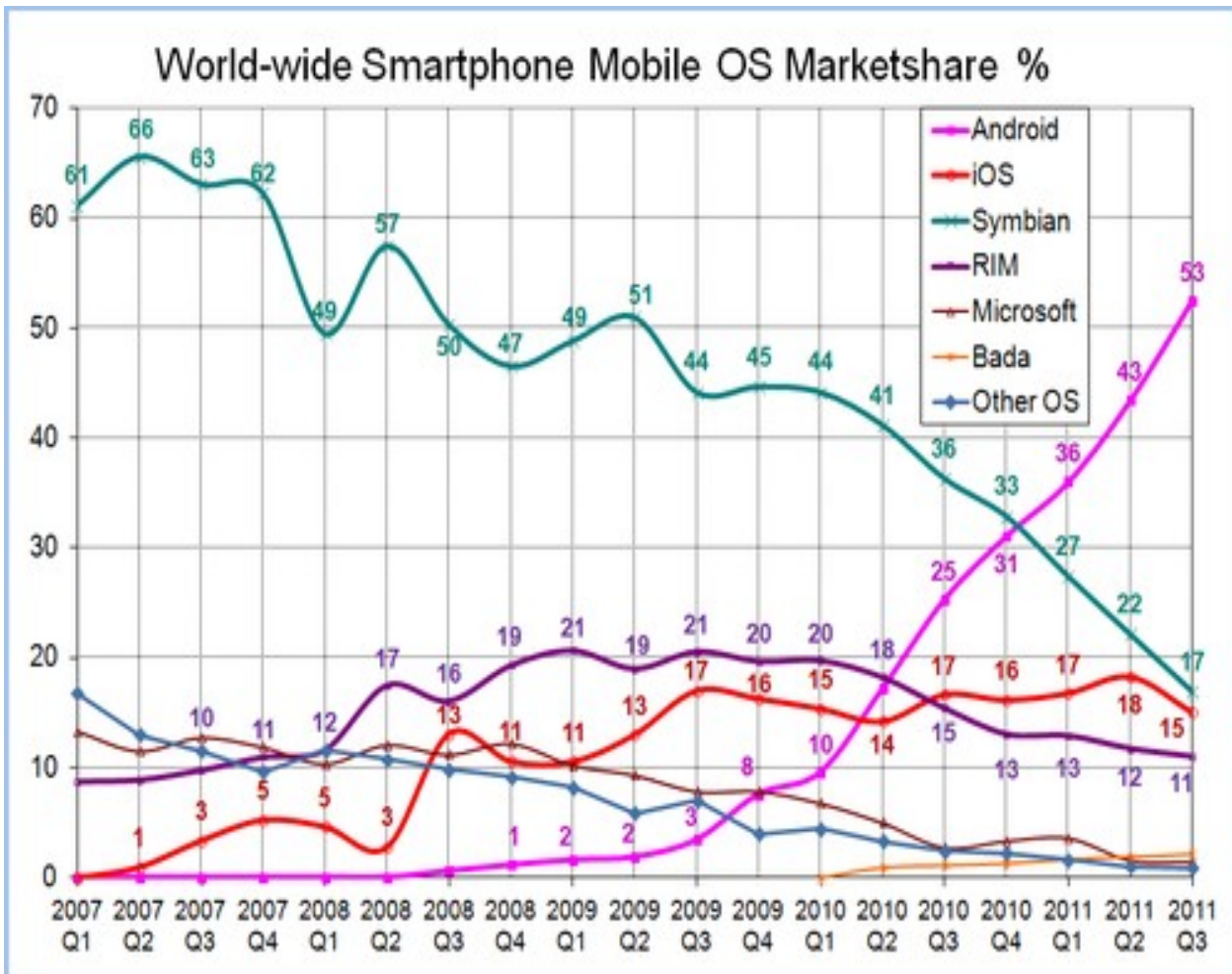


Figure 3.1.2.1 : World Wide Mobile Os Market Share %

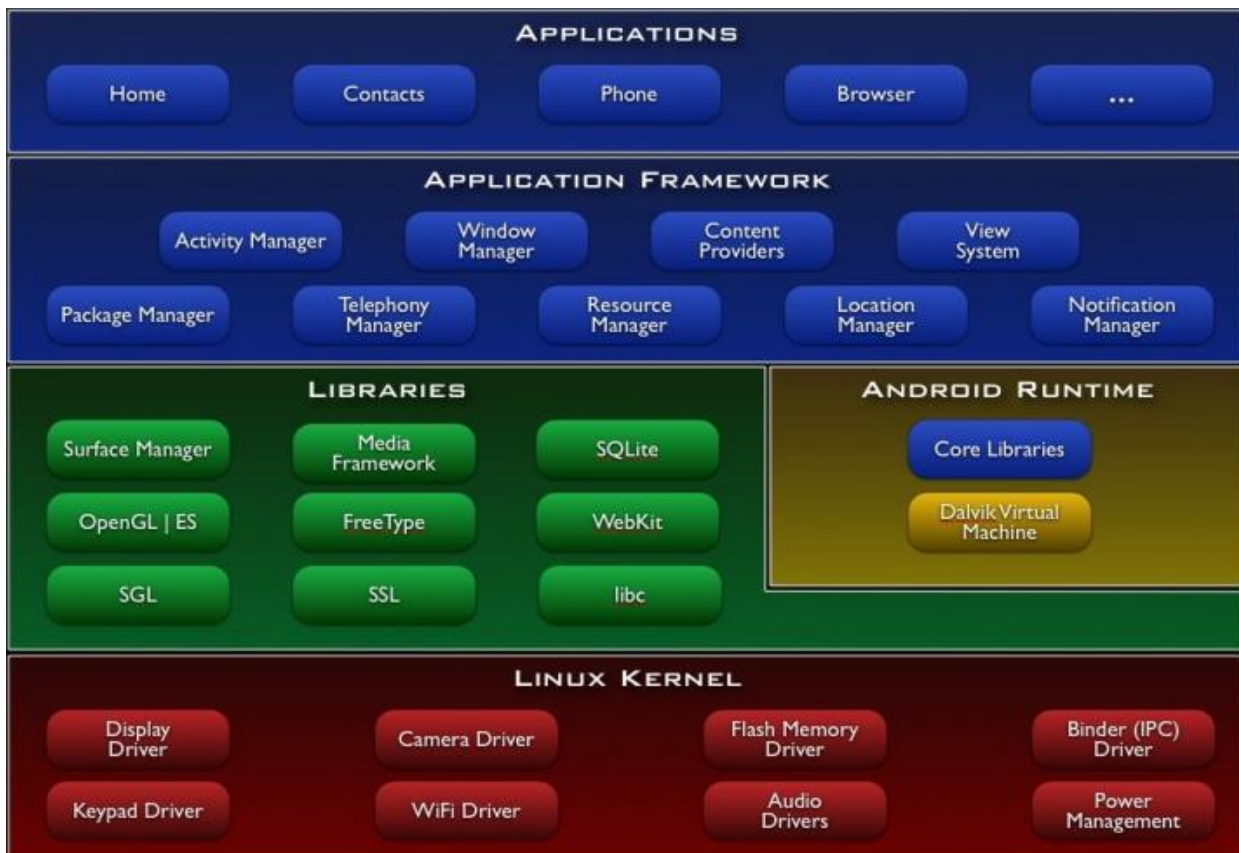


Figure 3.1.2.2 : Application FrameWork

3.1.3 FEATURES:

- a) Application framework enabling reuse and replacement of components.
- b) Dalvik virtual machine optimized for mobile devices
- c) Integrated browser based on the open source Web Kit engine.
- d) Optimized graphics powered by a custom 2D graphics library; 3D graphics based on the OpenGL ES 1.0 specification (hardware acceleration optional).
- e) SQLite for structured data storage
- f) Media support for common audio, video, and still image formats (MPEG 4, H.264, MP3, AAC, AMR, JPG, PNG, GIF)

3.2 Design Objectives:

The design process translates the requirement into a representation of the software that can access for quality before the coding begins. Like the requirements, the design is also documented and becomes a part of the software organization. The objectives that to be considered are:

- a) Controlled Redundancy
- b) Data Independence
- c) Accuracy
- d) Integrity
- e) Security
- f) Performance

3.3 Design plan

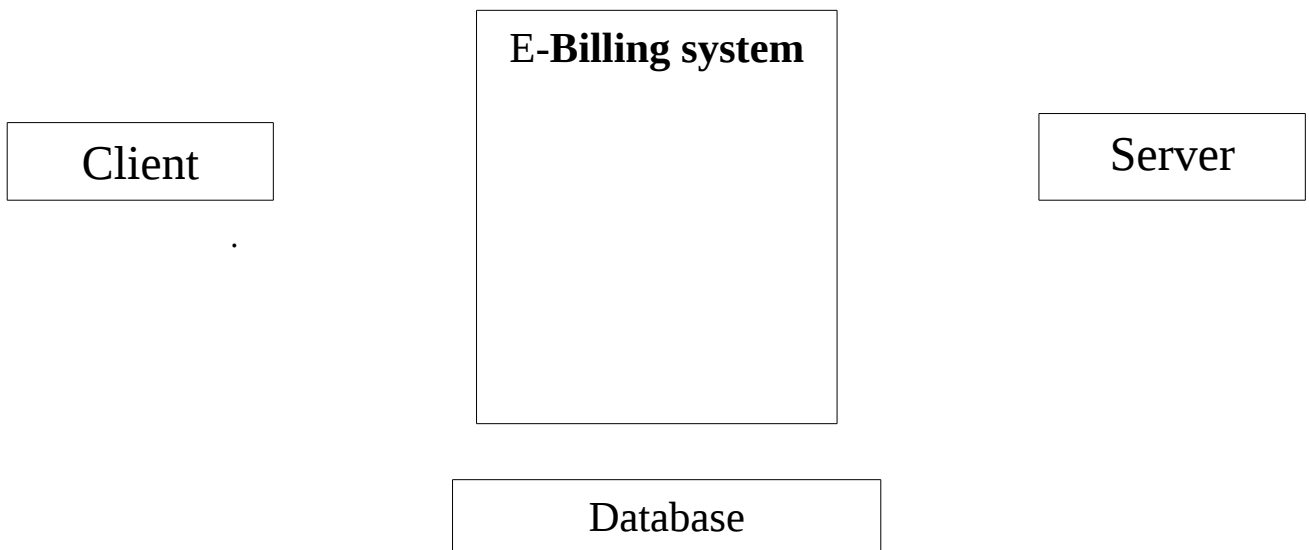
The design must be translated into machine-reliable process focuses on the logical intervals of the software, assuring that all statement have been tested, and on the factional externals-that is, conducting tests on uncover errors and ensure that define input will produce actual result that agree with require results.

- a) Data flow diagram
- b) Use case diagram
- c) Class diagram

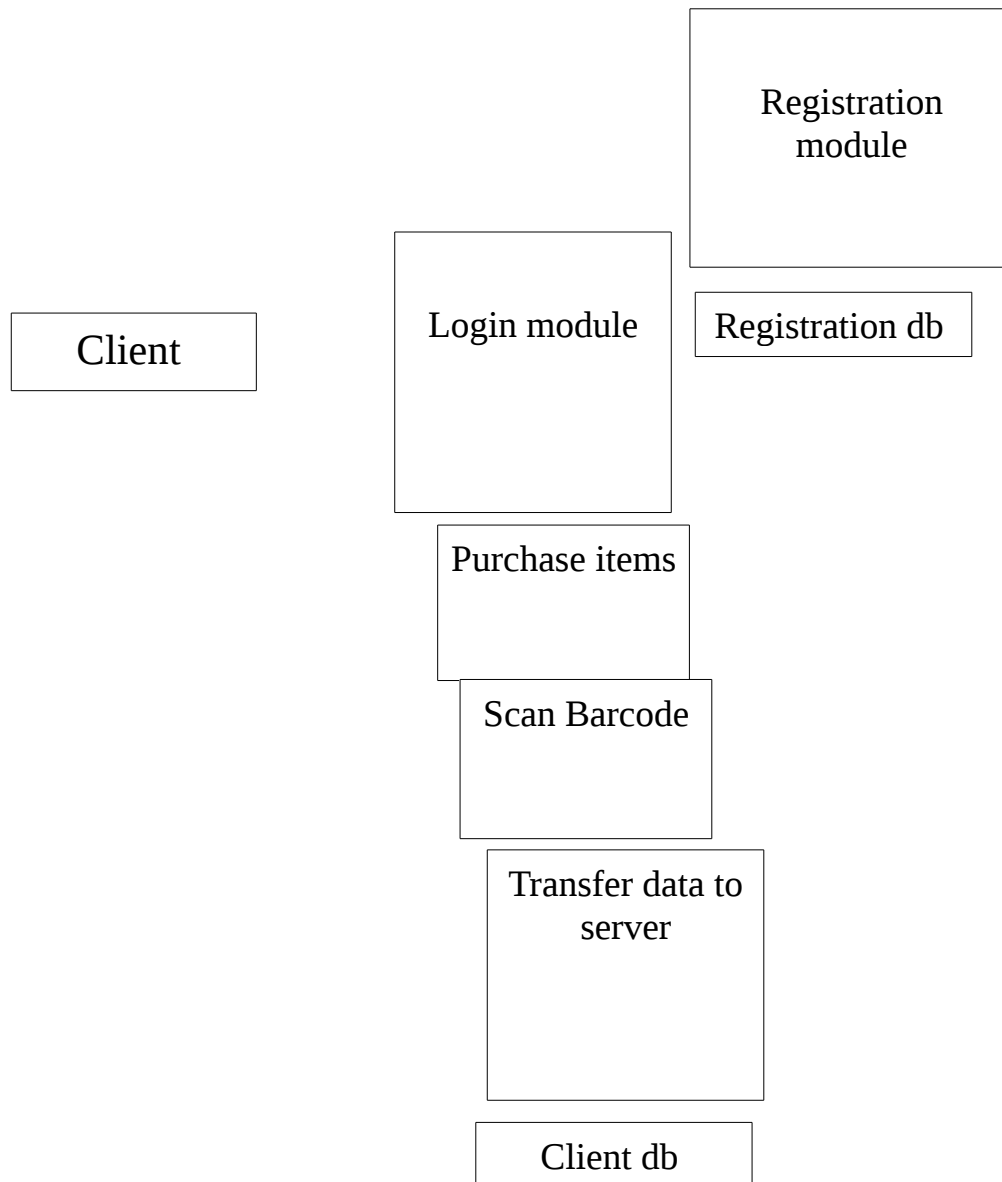
3.4 Analysis and Design Workflow

3.4.1 Flow Diagram

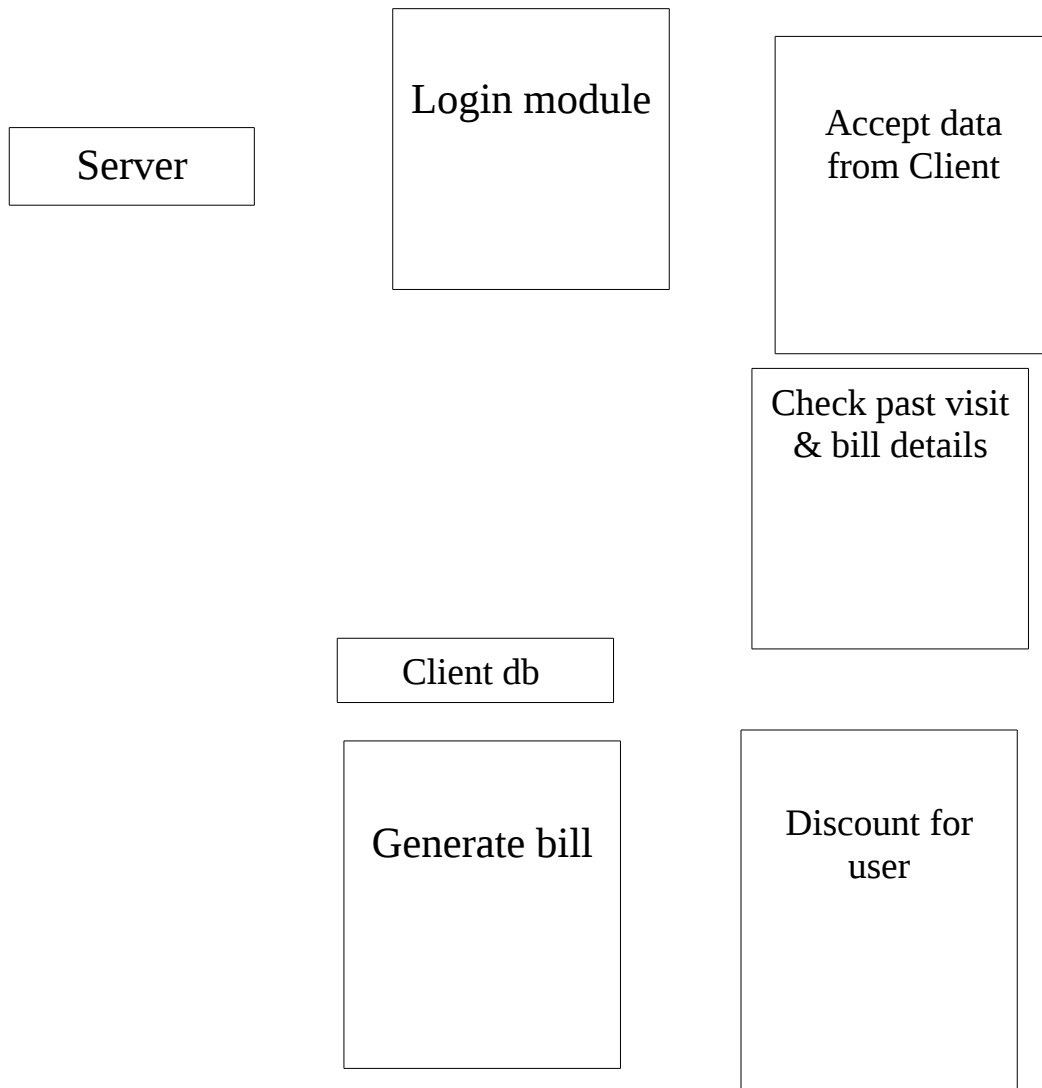
3.4.1.1 DFD Level 0



3.4.1.2 DFD Level 1



3.4.1.3 DFD Level 2



3.4.2 Use case Diagrams

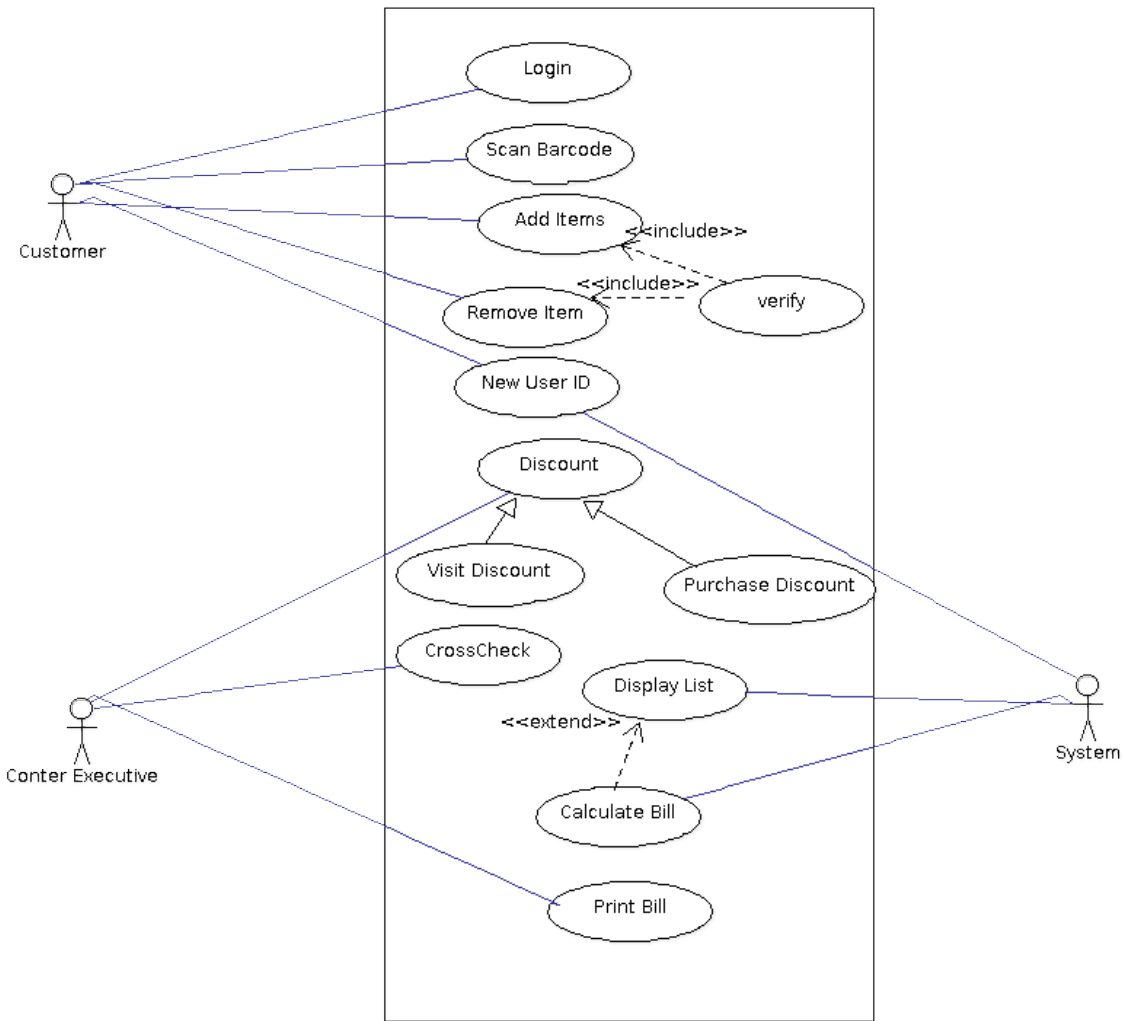


Fig 3.4.2 Use Case Diagram

3.4.3 Sequence Diagram

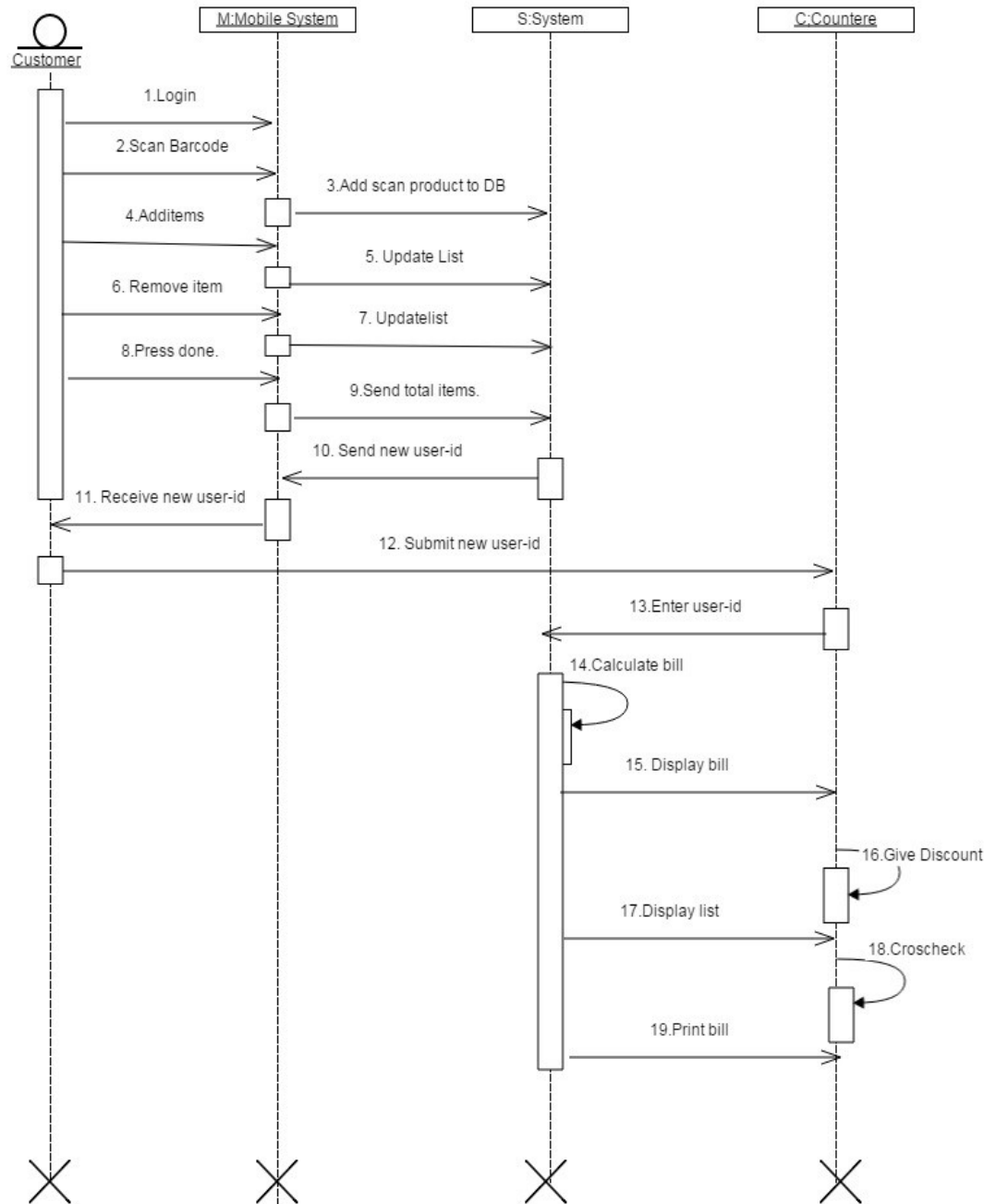
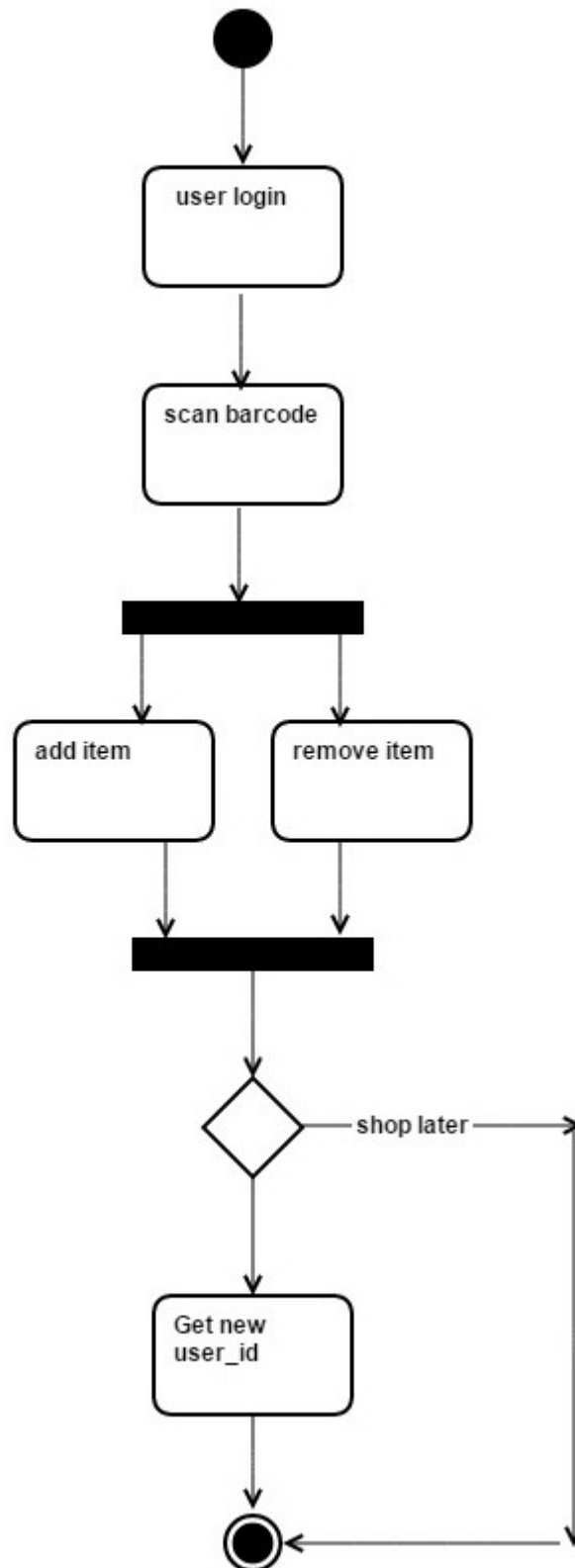


Fig 3.4.3 Sequence Diagram

3.4.4 Activity Diagram



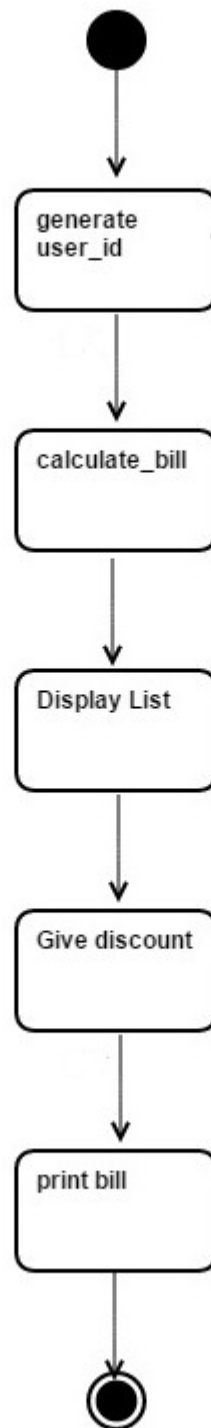


Fig 3.4.4 Activity Diagram

Chapter 4

Implementation

4.1 Implementation Methodology (different modules in project)

4.1.1 Modules

1. Personal Information Gathering (Registration)
2. User verification
3. Barcode scanning
4. Data passing to server
5. Applying K-clustering for discount generation

4.1.2 Module Description

1. Personal Information Gathering (Registration):

The work here starts during the first time installation of our application. It gathers the basic customer information like first name, last name, date of birth, city, state etc., and it will be stored into user mobiles, SQLite database for registration purpose. So every time when the user buys the ticket this customer information is also sent to the database for security purpose and used also in the Barcode generation.

2. User verification

With a use of this module we are going to authenticate user using MySQL in back end.

3. Barcode scanning

In this module we scan Barcode and extract all data from Barcode and store it in our cart by one by one. This data is also useful to generate use bill.

4. Data passing to server

In this module we are going to send stored data to server end for verification process. And bill generation.

5. Applying K-clustering for discount generation

We going to use k-clustering algo for user discount generation first we going to check user's total visit and buying items rate and generate appropriate discount to user.

4.2 Technology

4.2.1 Android

In 2005, Google acquired Android from Android Inc. which was found in year 2003 by Andy Rubin and they dealt with developing software for mobile de vices. Later, OHA which comprises of 79 companies along with Google developed their new mobile platform for mobile devices. This alliance was formed so as to develop open technologies for mobile devices and make those applications easily available in the market. This new open source technology was named as Android. Android is an open source architecture which is used for developing applications for mobile devices. Android works on Linux Kernel. It has an operating system, middleware and key applications. Android announced its code under the license of free software/open source in the year 2008. Android comes up with an API for mobile devices. This Linux Kernel supports Java Virtual Machine which favors Java to be most suitable programming Language for development of the applications. Google provides a SDK to all developers which include libraries, debugger and a handset emulator in Eclipse IDE [5, 6]. The application which is developed in Android can be tested using this emulator which workss similar to a mobile phone.

4.2.2 JAVA

Java is a [computer programming language](#) that is [concurrent](#), [class-based](#), [object-oriented](#), and specifically designed to have as few implementation dependencies as possible. It is intended to let application developers "[write once, run anywhere](#)" (WORA), meaning that code that runs on one platform does not need to be recompiled to run on another. Java uses an [automatic garbage collector](#) to manage memory in the [object lifecycle](#). The programmer determines when objects are created, and the Java runtime is responsible for recovering the memory once objects are no longer in use. Once no references to an object remain, the [unreachable memory](#) becomes eligible to be freed automatically by the garbage collector.

4.2.3 MySQL

MySQL is well known as world's most widely used open-source database (back-end). It is most supportive database for PHP as PHP-MySQL is most frequently used open-source scripting database pair. The user-interface which WAMP, LAMP and XAMPP servers provide for MySQL is easiest and reduces our work to a large extent.

4.2.4 Barcode

A barcode is an optical machine-readable representation of data relating to the object to which it is attached. Originally barcodes systematically represented data by varying the widths and spacing's of parallel lines, and may be referred to as linear or one-dimensional (1D). Later they evolved into rectangles, dots, hexagons and other geometric patterns in two dimensions (2D). Although 2D systems use a variety of symbols, they are generally referred to as barcodes as well. Barcodes originally were scanned by special optical scanners called barcode readers. Later, scanners and interpretive software became available on devices including desktop printers and smartphones.

They come to us from Japan where they are very common. Barcode are used to take a piece of information from a transitory media and put it in to your cell phone. You may soon see Barcodes in a magazine advert, on a billboard, a web page or even on someone's t-shirt. Once it is in your cell phone, it may give you details about that business (allowing users to search for nearby locations), or details about the person wearing the t-shirt, show you a URL which you can click to see a trailer for a movie, or it may give you a coupon which you can use in a local outlet. The reason why they are more useful than a standard barcode is that they can store (and digitally present) much more data, including url links, geo coordinates, and text. The other key feature of

Barcodes is that instead of requiring a chunky hand-held scanner to scan them, many modern cell phones can scan them.



Figure 4.2.4: Barcode

4.3 Software Requirements

- a) Java
- b) ADT Bundle
- c) MySql

4.3.1 Supported Operating System

- a) WNDOWS
- b) LINUX
- c) MAC

4.3.2 Supported Operating System [for client]

- a) ANDROID

4.3.3 Supported Operating System [for Server]

- a) Windows
- b) Linux
- c) Mac

4.2.4 Software tools require for server side development

- a. FRONT END : JAVA 6/Android SDK/Apache tomcat Server/
- b. BACKEND : MySql

4.3 Hardware Requirements

- a) PROCESSOR : PENTIUM IV
- b) HARD DISK : 40 GB
- c) RAM : 512 MB
- d) MONITOR : 15" COLOR MONITOR
- e) KEYBOARD : 104 KEYS STANDARD KEYBOARD
- f) MOUSE : STANDURD 3 BUTTON MOUSE

Chapter 5

Future Work

5.1 Future Work

Though our project is itself matured enough but still betterment is always an open door. in this case also we can add some features to this project to make this project more reliable. These are as follows: - firstly, the purchasing procedure should be very strong and should provide user with the best result for whatever he or she is purchasing.

- a) Secondly, modify the project with order and product management system.

b) Lastly, we can develop it using NFC for online money transfer.

Chapter 6

Appendix I

I.1 Usage of Mobile Payment

This statistic gives information on usage of mobile payment in india from 2006 to 2014.

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