Tribhuvan University

Himalaya Darshan College

Biratnagar, Nepal

A Final Year Project Report

On

Mobile Payment System

Under the Supervision of

Er. Dhiraj Kumar Jha

Submitted To:

Department of Computer Science and Information Technology

Himalaya Darshan College

In partial fulfillment of the requirement for the Bachelor Degree in Computer Science and Information Technology

Submitted By:

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SUPERVISOR'S RECOMMENDATION

I hereby recommend that the report prepared under my supervision by Binita Niroula, (8171/072), Laxmi Dhakal (8173/072) and Mamata Sharma (8174/072) entitled "**Mobile Payment System**" in partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Information Technology be processed for evaluation.

……..…….

Er. Dhiraj Kumar Jha

Project Supervisor

CERTIFICATE OF APPROVAL

This is to certify that this project prepared by Binita Niroula (8171/072), Laxmi Dhakal (8173/072) and Mamata Sharma (8174/072) entitled "**Mobile Payment System**" in partial fulfillment of the requirements for the degree of B.Sc. in Computer Science and Information Technology has been well studied. In our opinion, it is satisfactory in the scope and quality as a project for the required degree.

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ABSTRACT

The world is changing every second due to the enormous growth of information and communications technology, everything is at our fingertips. Even a little effort of technology can make huge difference new heights can be reached and new standards can be set. **Mobile Payment System** is an innovation that aims to bring about effective outcomes on digital payment through the use of technology.

"Mobile Payment System" is an android application focused on the payment process through the unique way. This system provides the user with a platform to pay the bill through transaction number (PAN/VAT). The Unique Mobile payment System undertaken as a project is based on relevant technologies. The main aim of this project is to develop application for digital payment system.

Keywords: ***Information Communication Technology, Digital payment, Android application, PAN/VAT***

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ABBREVIATIONS

RFID	Radio Frequency identification
ICT	Information Communication Technology
ERD	Entity Relationship Diagram
GDP	Gross Domestic Product.
MoF	Ministry of Finance
HTML	Hypertext Markup Language
XML	eXtensible Markup Language

CHAPTER-1

INTRODUCTION

1.1 Project Introduction

ICT is just booming up day by day and there are many new technologies, which is innovated so far. Although the world has changed to the electronic era, there is still slower adaptation in the field of digital payment. Today the business world is in the midst of a digital transformation. Mobile payments have quickly evolved over the past few years in Nepal, with more and more recognizable brands and promising start-ups stepping into the industry to improve technology and deliver what businesses and consumers want from services and apps that let them pay using their phones.

Mobile Payment System is the real time payment system that directly connects the bank account and allows making the payment easily through the unique transaction id. Mobile payment system is the payment system that focuses on the virtual money transaction. User do not have to load their fund into a wallet to make the payment and should not stand in the queue for making the payment thus saving the time of every user. Instead of paying with cash, cheque, or credit cards, a consumer can use a mobile to pay for a wide range of services and digital or other goods. A mobile device will eliminate the inconvenience of carrying multiple plastic cards, cash, and cheque by enabling consumers to link mobile payments to those card accounts, bank accounts.

1.2 Background

Mobile technology is revolutionizing the global banking and payment industry [6]. Nepal is the most competitive country in the south Asia in term of corporate income. The economy of Nepal has been long in the situation of low investment and low growth and remains among Asia's poorest countries. "Nepal ranks 158th for paying taxes in the doing business ranking out of 190 countries [7]". Online paying system is getting more and more important for collecting government revenue while information technology system is getting advanced every day [8]. Digital Payments are, simply enough, payments made through digital channels. They convert a traditional cash-operation to a cashless one. All transactions are completed online. Customers no longer need to carry cash or visit an ATM. In fact, they do not even need to be physically present to pay. Customers can pay anytime from any part of the world. Digital

transactions are much more secure than traditional transactions because they are processed by secure gateways, which are hard to tamper with. Details of payments are stored in merchant-specific databases. Both merchants and customers have easy access to payment information. This avoids ambiguity and confusion while tracking. Mobile payment methods have several advantages over traditional payment methods in managing finances and controlling spending. Mobile payment methods can enable consumers to check their account balances prior to making a purchase, even in a brick-and-mortar store and without access to a personal computer. Money transfer between virtual accounts usually takes a few minutes, while a wire transfer or a postal one may take several days. It reduces the risk of lost and theft. Physical cash can be anonymous and untraceable, allowing it to play a large role in crime, including bribery, tax evasion, money, counterfeiting, corruption and terrorist financing. However, cashless payments leave behind traceable records, making it harder to conceal income, evade taxes and hide black market transactions.

1.3 Problem Statement

This product is one of the various payment method that focuses on virtual money transaction. Virtual money transaction can replaces the cash during transaction which in turn controls the tax leakage. In this context, VAT/PAN has unique receipt no for each unique transaction which can be used for intended virtual money transaction. Accessibility can make it easier for all the users, not only those with disabilities, to interact with the application including non-technical user. This project aims to improve the overall usability, accessibility and user experience to all the users inclusive to *e-Sewa* and *Khalti*.

1.4 Objectives

The main objectives of this project are listed below:

- To digitize the paper billing system.
- To optimize the payment process.
- To improve accessibility during the payment process.

1.5 Scope

- Provide access to financial payment services to every citizen
- Digitize the billing work for any kind of payment
- Digitalize Government collection by providing each collection point with a method to accept digital payment
- Migrate the payment process from cash dominated to non-cash.

CHAPTER - 2

REQUIREMENT ANALYSIS

2.1 Literature Review

In Nepal, digital wallets like *e-Sewa* and *Khalti* are providing online payment services however, these services are limited and they are not as widespread as they should be. Mobile payment is being adopted all over the world in different ways. "Mobile payments are widely used in a number of countries, including both emerging markets and the developed countries. In emerging markets, most mobile payments are person-to-person transfers. In developed countries, mobile payments tend to be used for consumer purchases at stores or over the Internet. In emerging markets, such as in Africa, many consumers have mobile phones but few have bank accounts, spurring interest in mobile phones as a means of access to financial and payments services. On the other hand, in developed countries such as Japan and South Korea, mobile payment methods using RFID (Radio Frequency identification) technology were introduced along with contactless cards because they were especially suited to mass transit. With that base, mobile payments then gradually became accepted by other merchant sectors [1]". Similarly, in India and China, our neighbouring countries, they have majority of their payments handled digitally through digital payment services with big players such as *WeChat*, *PayPal*, *PayTM* and *AliPay*. On the other side of the spectrum, our economy has a long way to go.

"As the country's revenue collection has been recorded growing each passing year, Nepal's tax-to-GDP ratio has reached the highest among South Asian countries and is at par with emerging market economies like South Korea. According to the Ministry of Finance (MoF), the government collected revenue worth Rs 609.17 billion in the last fiscal, which was 23.8 per cent of the country's gross domestic product (GDP). The government has been expanding the revenue collection target every year. As a result, the tax-to-GDP ratio could go up further in the coming fiscal years. The tax-to-GDP ratio of the country has increased rapidly as compared to other economies. In fiscal 2007-08, the country's tax-to-GDP ratio stood at 13.2 per cent, almost half it's standing in the last fiscal. For comparison, the tax-to-GDP ratio in neighbouring India rose from 10.4 per cent in 1965 to 16.6 per cent in 2015-16 [2]".

“WPR 2018 finds that the global e-wallet market is growing even faster, with transaction volume estimated to total 41.8 billion, which is about 8.6% of global non-cash transactions. Alibaba, Tencent, Google, Apple, Facebook, and Amazon have captured a significant share of this market. There is increasing evidence that high levels of non-cash transactions can benefit society in a number of ways and can even help to solve challenging problems, such as corruption and payments fraud [3]”.

“Norway has the lowest cash usage in Europe according to publicly available statistics, only six percent of value and eleven percent of number of transactions at point of sale. Both Norwegian citizens and the retail sector have totally embraced cards for payments in shops, hotels, etc. In fact, we have, together with Iceland, the highest usage of cards per capita in the world. Since DNB introduced the VIPPS mobile app in the Norwegian market three years ago, it have seen an explosive development in mobile payments. VIPPS started by covering payments and is now covering (or will soon cover) all kind of payments (P2P, bill payments, mobile commerce, in-store payments, in-app payments, etc., thus aiming to cover a full spectrum of user-cases). VIPPS is now used by two-thirds of the Norwegian population, is one of the best-known brands in Norway and the fastest growing brand ever irrespective of business, with a ninety-five percent brand recognition. Most banks in Norway participate in VIPPS. Today, VIPPS has merged with the two Norwegian Bank companies BankAxept (the national debit card scheme) and BankID (the national electronic identification or eID scheme) and has thus become a major player in the Nordic and European markets for payments, eID and digital excellence” [4].

“In past few years, mobile wallet took spotlight as alternative of existing payment solution in many countries such as USA, South Korea, Germany and China. Although considered as one of the most convenient payment, mobile wallet only claimed 1% from total electronic payment transaction in Indonesia. The aim of this study is to identify the behaviour and user acceptance factors of mobile wallet technology. Online survey was conducted among 372 respondents to test hypothesis based on UTAUT2 model. Respondents consisted of 61.29% of male and 38.71% of female with age proportion was dominated by age group of 20's of 78.76%. In addition, 50.81% of respondents never used mobile wallet before and 49.19% of respondents have ever used mobile wallet. Data obtained were confirmed using confirmatory factor analysis and analysed using structural equation model. The study found that habit was the factor that most

strongly affected individual behavioural intention to use mobile wallet in Indonesia, followed by social influence, effort expectancy and hedonic motivation. The findings of this research for management can be used as consideration for making product decision related to mobile wallet. Further study is needed, as mobile wallet is still in early stage and another factor beside UTAUT2 should be considered in the study" [5].

2.2 Requirement Analysis

Requirements analysis encompasses those tasks that go into determining the needs or conditions to meet for a new or altered product or project. Requirement specification provides a detailed view of the requirement needed by the programmer for developing a project. The software requirement specification provides the description of a software system to be developed. There are many things to consider while developing a well-functioning system. Requirement analysis of system points out the most essential necessity and fundamental functionality of the system. There are two types of requirement:

2.2.1 Functional Requirements

Functional requirement defines a function of a system or its component. A function is described as a set of inputs, the behaviour, and outputs. These are Statements of services the system should provide, how the system should react to particular inputs and how the system should behave in particular situations and also concerns with who should interact with the system.

2.2.2 Non-functional Requirements

Non-functional requirements are requirements that are not directly concerned with the specific functions delivered by the system. They may relate to emergent system properties such as reliability, response time, and storage occupancy. They may specify system performance, security, availability, and other emergent properties.

The non-functional requirements of this system are as follow:

- The system should be reliable because the payment can only be verified by the clearing house.
- The system should be user friendly.
- The system should be consistent and secure.

- Interface should produce relevant error message and handle exceptions.

2.3 Feasibility Analysis

Before starting the project, feasibility study had been carried out to measure the viability of the system. Feasibility study determines if creating a new or improved system is user friendly, within the cost, and within the stipulated time or not. Following are the feasibility that has been performed for this project:

2.3.1 Technical Feasibility

Technical feasibility was analysed by specifying equipment and application that satisfy the user requirements. It includes the hardware and software device requirements. For using the system there is no need of advanced technological knowledge. It has simple user interface which can be easily understood. During technical feasibility analysis, technological issues regarding the system was studied. The major emphasis was on identification of the specifications of the hardware and the software that will be used, in order to satisfy the end-user's requirements.

2.3.2 Operational Feasibility

It is the measure of how well a developed system solves the problems and how it satisfies the requirement identified during the requirement analysis phase. The system is device compatible and easy to use. This application is very user friendly and does not require any technical knowledge to operate.

2.3.3 Economic Feasibility

Economic feasibility analysis is the most commonly used method for determining the efficiency of a new project. The required resources were freely available for the purposed system. Therefore, it was assured that the system is economically feasible. Cost and time are the most essential factors involved in this field of study.

2.3.4 Schedule Feasibility

Schedule Feasibility is the probability of a project to be completed within its schedule time limits, by a planned due date. If a project has a high probability to be completed on- time, then its schedule feasibility is appraised as high. Schedule feasibility analysis was done through Gantt chart.

ID	Task Name	Start	Finish	Duration
1	Requirement Analysis	4/17/2019	4/26/2019	8d
2	Database Design	4/26/2019	5/1/2019	4d
3	GUI design	4/23/2019	5/6/2019	10d
4	Implementation Using Android / SQLite	5/6/2019	6/28/2019	40d
5	Testing	4/24/2019	8/15/2019	82d
6	Documentation	4/22/2019	8/23/2019	90d

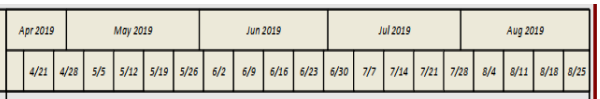


Figure 2.1: Gantt chart

CHAPTER-3

SYSTEM ANALYSIS

3.1 Structuring system requirements

The field of system analysis relates closely to requirements analysis. It is also an explicit formal inquiry carried out to help a decision maker identify a better course of action. It contains the unpacking of the system requirements from data modelling and process modelling of the system.

3.2 Data Modelling

Data modelling is a process used to define and analyse data requirements needed to support the business process within the scope of corresponding information systems in organizations.

3.2.1 ER Diagram

An entity-relationship model (ER model) describes inter-related things of interest in a specific domain of knowledge. The following ER model shows the entities, their attributes and relationships between them in our application.

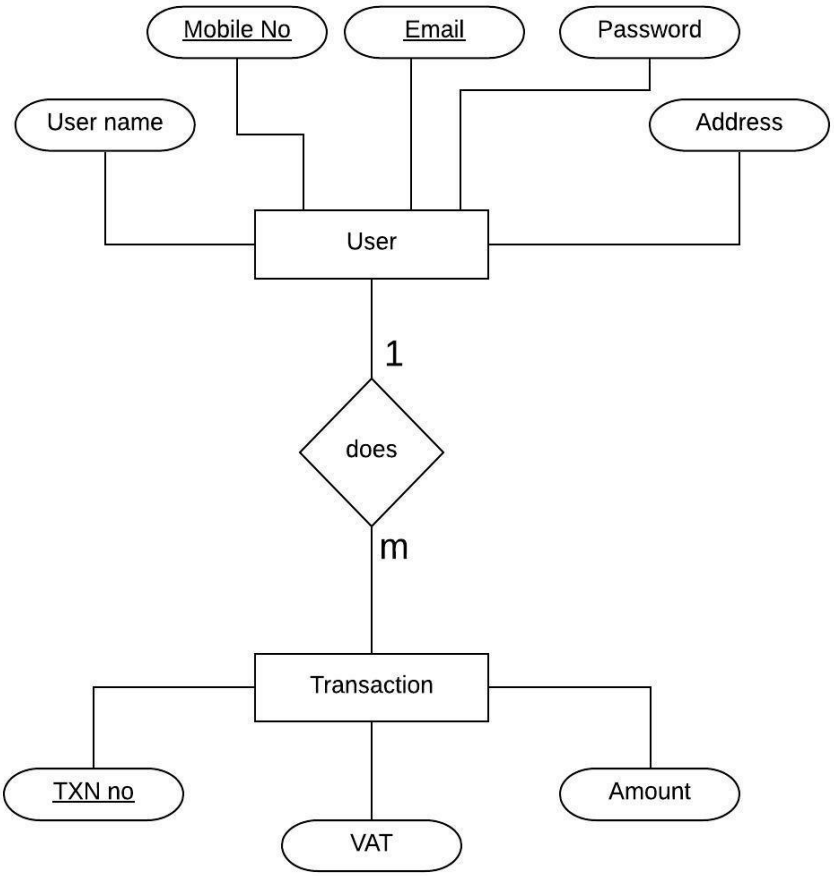


Figure 3.1: ER Diagram

ER Diagram can express the overall logical structure of a database graphically. Graphical representation of the system will be easier to understand. So such graphical representation plays a vital role to represent a database. There are two entities in the system where user does the transaction and the relation between them is one to many and have collected all the possible attributes in the unique mobile payment system.

3.3 Process Modelling

Process modelling is a technique for organizing and documenting the structure and flow of data through a system's processes and/or the logic, policies, and procedures to be implemented by a system's processes.

3.3.1 Use-case Diagram

The following use case diagram describes a set of action for a system, and the interaction between the actors (users, admin) and system.

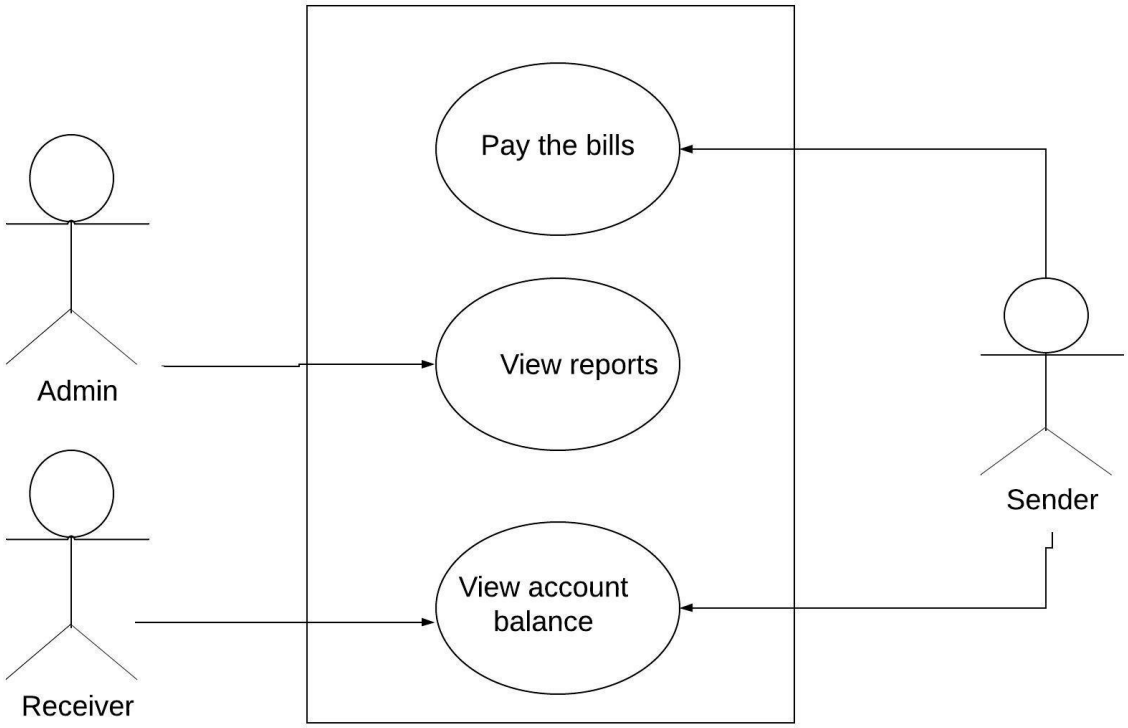


Figure 3.2: Use-case Diagram

In this diagram, there are three role played in the system. The first role is played by admin which view the reports and registers new company. But actually, there are two role played in the system. User plays the role of both customer and shopkeeper. The role differs according to the situation if it is paying fund then the role is played by the sender and if it is receiving the fund then the role is played by the receiver. Both the user can view their balance.

Table 3.1: View Reports

Use-case Identifier	UC 1: View Reports
Primary Actor	Admin
Secondary Actor	None
Description	The admin should login and view the report based upon the VAT/PAN and specified duration.
Pre-condition	The admin must be logged in.

Post-condition	Excel sheet should be downloaded in offline mode.

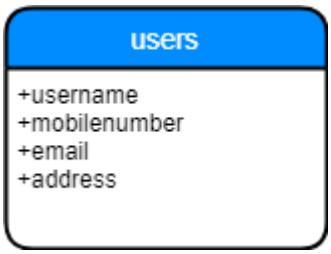
Table 3.2: Pay the bills to the shops

Use-case Identifier	UC 2: Pay the bills to the shops
Primary Actor	Sender
Secondary Actor	Receiver
Description	The user should login and pay the bills through PAN/VAT and also receive the funds.
Pre-condition	The user must be logged in.
Post-condition	The fund should be transferred to the receiver and deducted from the sender.

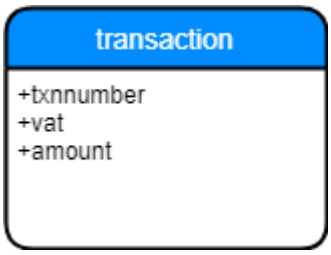
Table 3.3: View account balance

Use-case Identifier	UC 3: View account balance
Primary Actor	Sender
Secondary Actor	Receiver
Description	The user can view his account, transaction history and pending payments.
Pre-condition	The user must be logged in.
Post-condition	The user can download the record in offline mode.

3.3.2 Data Model Diagram




```
{
    username: binita,
    mobilenumber: "9800909090",
    email: "binita@gmail.com",
    address: biratnagar
}
```




```
{
    txnnumber: "123456789",
    vat: "26",
    amount: "226"

}
```


```
//users
{
    username: binita,
    mobilenumber: "9800909090",
    email: "binita@gmail.com",
    address: biratnagar
}

//transaction
{
    txnnumber: "123456789",
    vat: "26",
    amount: "226"
}

{
    txnnumber: "123546789",
    vat: "26",
    amount: "226"
}
```

Figure 3.3: Data model Diagram

3.3.3 Workflow of the system

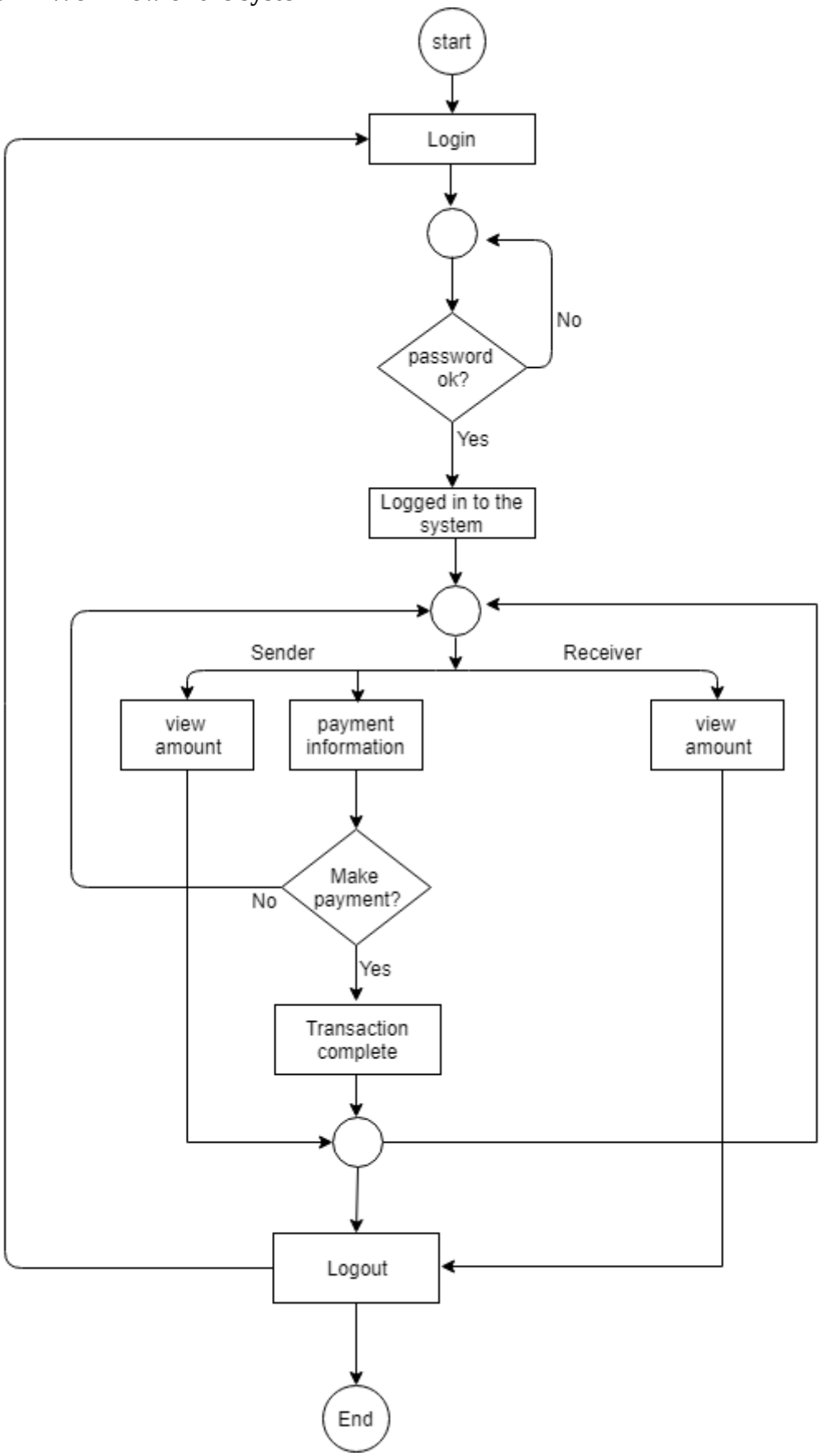


Figure 3.4: Workflow of the system

CHAPTER - 4

SYSTEM DESIGN

System design is basically a process of defining the components, modules, interfaces and data for a system in order to satisfy specified requirements. It can also be defined as a process of creating or altering systems along with the processes, practices, models and methodologies that can be used to develop them. The main objective of the detailed system design is to prepare a blueprint of a system that meets the goals of the conceptual system design requirements.

4.1 Process Design

The activity of determining the workflow, equipment needs, and implementation requirements for a particular process. Process design typically uses a number of tools including flowcharting, process simulation software, and scale models.

4.1.1 Class Diagram

Class Diagram is a static diagram. It represents the static view of an application and also used for visualizing, describing, and documenting different aspects of the system.

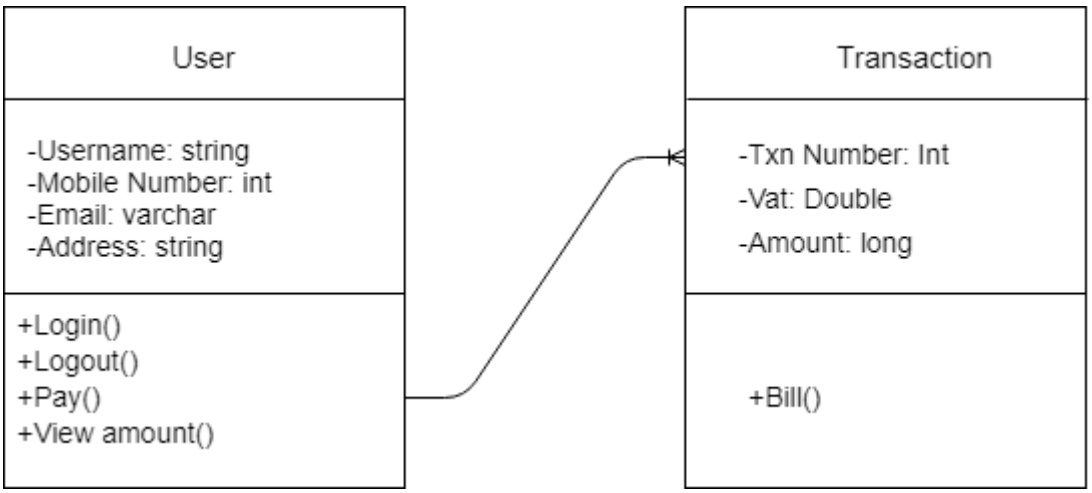


Figure 4.1: Class Diagram

In above figure there are two class user and transaction. There are attributes associated with the class. User can perform various operation like login, logout, pay and view account.

4.1.2 Activity Diagram for Registering a new Company by the admin.

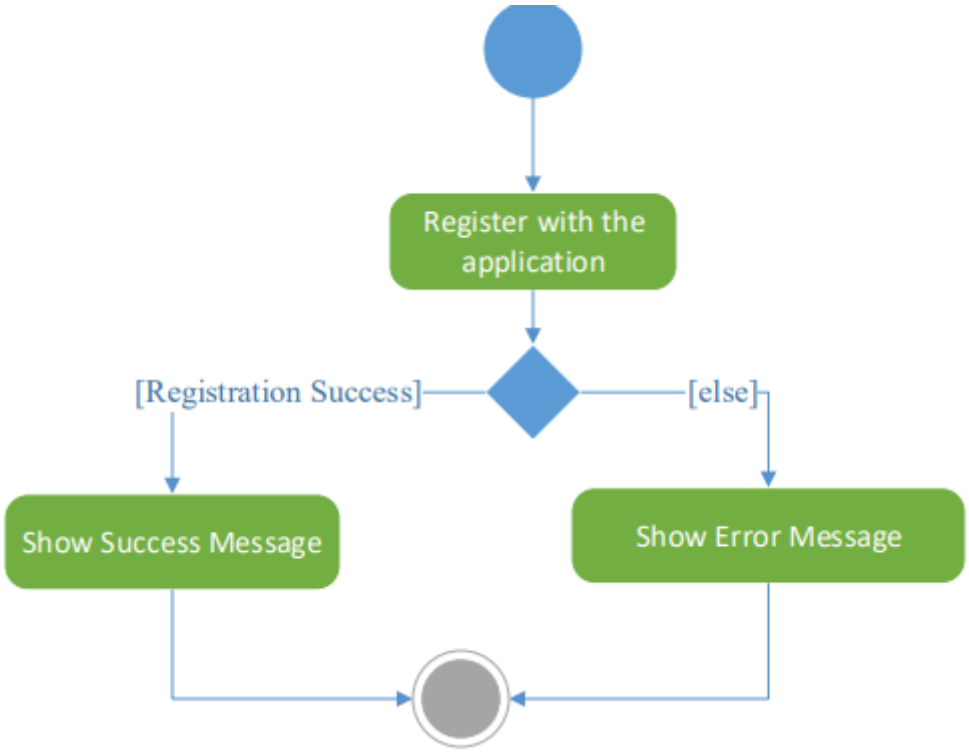


Figure 4.2: Activity Diagram for registering a new Company by the admin

Above figure is the activity diagram of the admin in which the new company can be registered to the system by the admin. First the admin register and login to the system by providing their appropriate credentials. If the registration is successful, then the system shows the message that the admin has successfully registered the company else it shows error message.

4.1.3 Sender Activity Diagram

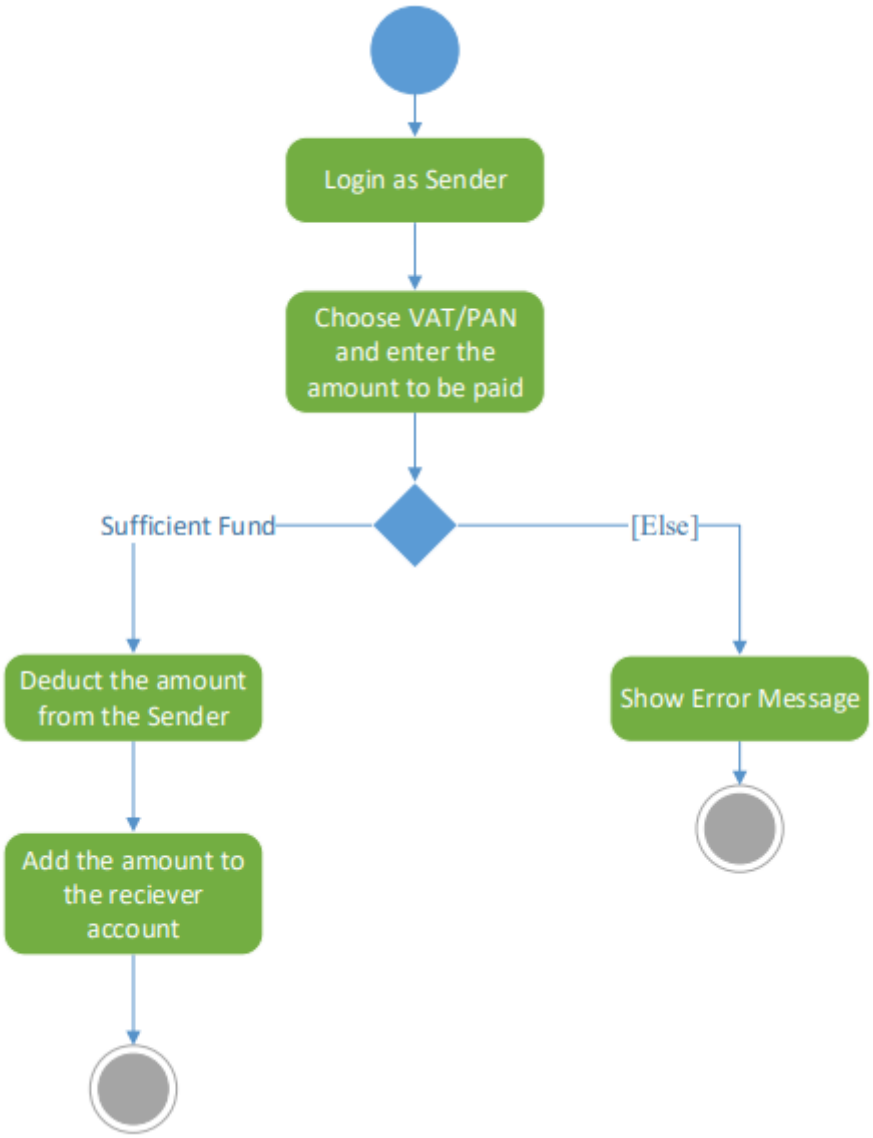


Figure 4.3: Sender Activity Diagram

Above figure is the activity diagram of the sender. To make payment, the sender have to login to the system by applying the valid credentials and the amount has been entered to make payment. If the payment is successful, then the amount has been deducted from the sender account and added to the receiver account else shows error message.

4.1.4 Receiver Activity Diagram

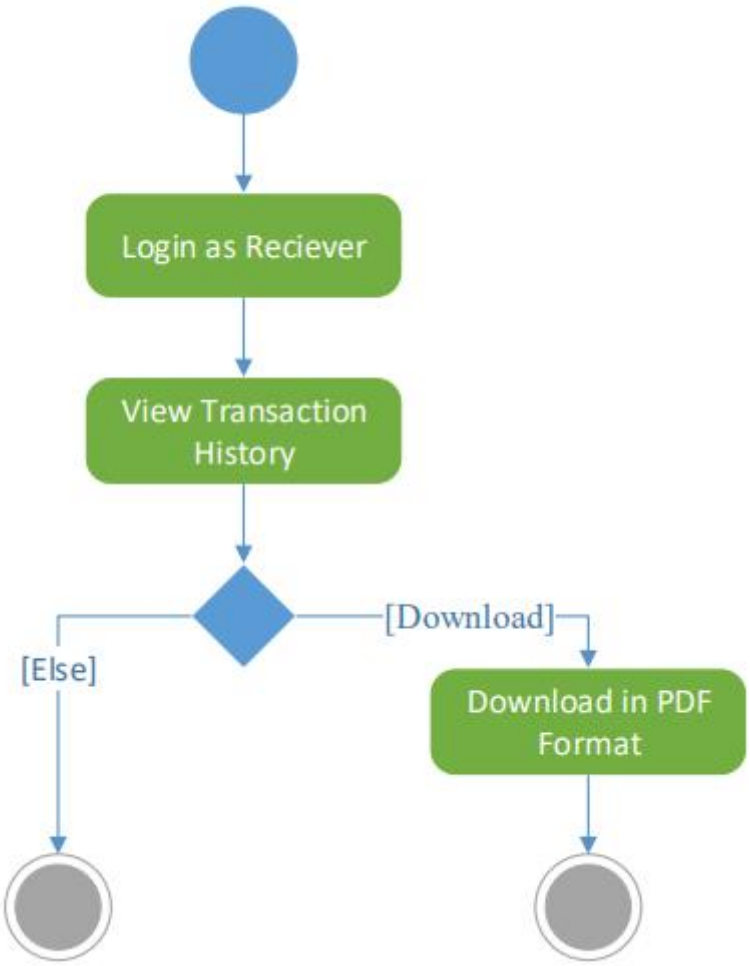


Figure 4.4: Receiver Activity Diagram

The above figure shows the receiver activity diagram. The receiver also have to be logged in to the system to view the amount. The history record can also be downloaded in the pdf form by the user.

4.1.5 Sequence Diagram

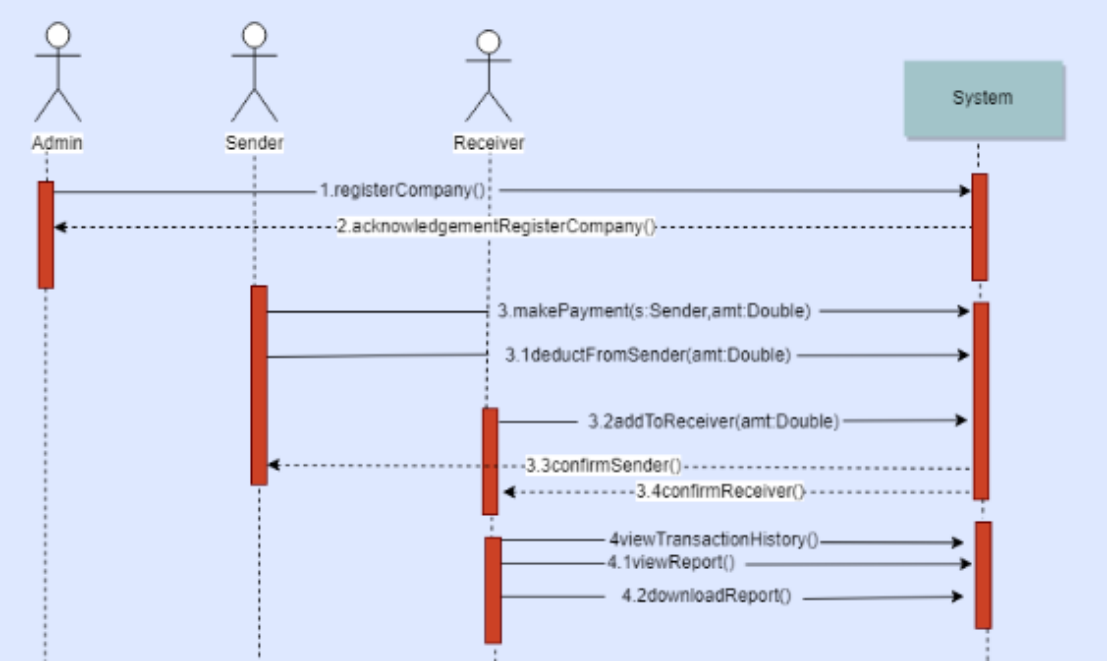


Figure 4.5: Sequence Diagram

In this diagram, there are three actors in the system in which first one actor is admin. The admin should register and login to the system first. The new company can be registered to the system by the admin. The admin can also view the report and download the reports in pdf form as offline. The second actor is sender who can make the payment. When the payment is completed, the balance is deducted from the sender and added to the receiver. The third actor is receiver. Both the sender and receiver can view their transaction history.

CHAPTER - 5

IMPLEMENTATION AND TESTING

5.1 System Requirement

Following are the tools and framework used for the accomplishment of this project:

5.1.1 Front End

- **XML**

XML is a mark-up language much like HTML used to describe data. In Android xml has been used for designing the layouts because xml is lightweight language so it doesn't make the layout heavy.

5.1.2 Back End

- **Java**

Java is the official language of Android development and is supported by Android Studio. The platform for application development in Android is Java. Java has huge open source support, with many libraries and tools available to make developers life easier

- **Firebase**

Firebase is a mobile platform that helps to quickly develop high-quality application. Firebase allows to build apps which need authentication, database, file storage, analytics and server side functionality without having to own and manage infrastructure and software required for server side support.

- **Firebase Real-time Database**

The Firebase Real-time Database is a cloud-hosted NoSQL database that lets to store and sync between the users in real-time. Real-time syncing makes it easy for the users to access their data from any device, be it web or mobile.

5.1.3 IDE

- **Android Studio**

Android Studio is the official Integrated Development Environment (IDE) for Android application development, based on IntelliJ IDEA. Android Studio offers

even more features that enhance the productivity when building Android application.

5.2 Requirement Identification

5.2.1 Hardware requirement (Development)

Processor	: Intel(R)core (TM) i5
Main Memory (RAM)	:4 GB
Hard Disk	:1 TB
Monitor	:15 inch Color Monitor
Keyboard	:108 Keys
Mouse	:Optical Mouse Hard Disk
Mobile	: Android

5.2.2 Software requirement

Front End/Language	: Java
IDE	: Android Studio
Back End/Database	: Firebase
Front Layout	: XML
Operating System	: Windows 10

5.3 Study of Existing System

The existing digital wallet user's *Khalti* and *e-Sewa* find it cumbersome to use, and is not meeting the user requirements properly. There is barely payment system through which user can make the virtual payment easily. Non-technical person are not being able to utilize the system they need the help of technical person to access it.

Testing is to check, verify and evaluate the product that comes up after going through the demanding process. System testing involves testing the system to validate that it meets user's specifications and objectives. The multiple modules were integrated into a single component and they were tested. This involved testing the system in order to correct errors or remove the defects. This stage involved testing source code to make sure that it produced the expected and desired results when subjected to a set of predefined conditions

5.5 Unit Testing

Unit testing is the process of testing and individual unit or group of related units. It falls under the class of white box testing. It is often done by the tester to test that the unit they have implemented is producing expected output against the given input. Each of the function modules were thoroughly checked and validated. The purpose of unit testing was to ensure the working of each module properly without any errors.

In this project unit testing has been done to verify whether the different transaction modules are responding properly under execution of the system and while testing the following outputs has been successfully obtained:

5.4.1 Test 1:

The objective of test 1 is to check, if any user wants login then only valid members (email and password) can login.

Table 5.1: Login

Objective	**Check Login Process**
Input	Email and Password
Expected output	Login page if user is valid
Original output	Wrong email or password
Error info	-

Solution

The error was resolved by entering correct email and password for a given user.

Table 5.2: Login after correction

Objective	**Check login process**
Input	Email and password
Expected output	Login page if user is valid or else displays error message
Original output	User was successfully logged in
Error info	-

5.4.2 Test 2:

The objective of Test 2 was to check if the logout process is properly working or not.

Table 5.3: Logout

Objective	**Check sign-out process**
Input	Clicked on Logout button
Expected	Alert box to proceed further
Original Output	Displayed same page and user was not logged out
Error info	The logout was not working properly

Solution

The error was resolved by giving desired alert dialogue box in logout form.

Table 5.4: Logout correction

Objective	**Check Sign-out Process**
Input	Clicked on logout dialog
Expected Output	Redirected to alert Box
Original Output	User was log out successfully
Error info	_

5.4.3 Test 3:

The objective of Test 3 were to check if the new account can be created successfully or not. Input given was email, password.

Table 5.5: Creating New Account

Objective	**Check Account Creation Process**
Input	email, password
Expected Output	Register successfully
Error Info	All the fields are mandatory to fillup

Solution:

The error was solved after filling all the fields with proper information.

Table 5.6 : Creating New Account correction

Objective	**Check Account Creation Process**
Input	Email, password
Expected Output	Register successfully
Error Info	_

5.5 Integration Testing

Integration testing was carried out where related module was individually tested. They are merged together and tested with correlated data. Integrating planning was performed before integrating all the modules. It occurs after unit testing and before validation testing. With the help of integration testing uncovered errors during module testing were fixed. Debugging of error reported during this testing was challenging and it was interesting to fix them as it gave a clearer picture of the whole system.

Table 5.7: Integration testing

Objective	**Check Integration Testing**	
Expected Output	Login	Login successful under different users
	Logout	Logout successful
	New Account	New Account Creation successful
	Account Transfer	Successful transferred
Error Info	Successful Execution of an application	

5.6 Application Testing

5.6.1 Login:

- **Negative Test Case:**

If the user gives wrong credentials and try to login, then system will respond you by proper authentication of credentials from database and get proper message to enter valid credentials.

- **Positive Test Case:**

By providing the valid credentials, the system will redirect us to the dashboard of mobile payment system when the user clicked login button.

5.6.2 New Account Creation:

- **Negative Test Case:**

The new account can be created by the new user. To create account, the user have to fill up the fields with valid credentials before creating a new account. User get a proper message to enter the correct values as per the attributes which they specified.

- **Positive Test Case:**

The new account can be created by the new by providing all the valid information in the form and if the information is correct then a new account of a new user is successfully created.

Table 5.8: Application Testing

Objective	**Check Registration Process**
Input	Email, Password
Expected Output	New Account Created Successfully

CHAPTER - 6

CONCLUSION

Mobile Payment System will provide a seamless, cashless transaction to the citizens. It will creates a user-friendly environment to make a simple payment and every people will be able to use it without any difficulties. It will provide the platform to pay the bill through online .Non-technical person will also get the benefit from this system.

Mobile Payment System does not provide special features to the user such as pending payment, viewing transaction history. It only allows the user to pay and receive their amount. It does not allow the admin and user to download and view the report. Android phone is required for using the application.

6.1 Future Enhancement

Furthermore, this system can be more enhanced in future for users. Since we have developed this project as android based application and in future this project can be made as online software so that users can do their transactions from any devices such as mobile, laptop from anywhere.

This application can be easily implemented under various situations .We can add new features when we required. Reusability is possible as when require in this application. There is flexibility in all the modules.

The advancement in digital technology has opened up new opportunities for businesses of all sizes and some has even grown almost overnight. There is no presence of global mobile payment services in our country. However, there is a huge possibility of mobile payment in Nepal

Today, it is possible to pay for only some of the daily services but with the changes in the market we will definitely see changes in the purchasing habit of the customers and people will start to make payment through different digital payment systems. As a consumer also it is convenient for us to pay through digital payment. Big transactions rarely take through cash

REFERENCES

[1]F. Hayasi, Kansascityfed.org, 2019. [Online]. Available: https://www.kansascityfed.org/publicat/econrev/pdf/12q1hayashi.pdf. [Accessed: 11- Apr- 2019].

[2]"Nepal’s revenue-to-GDP ratio highest among SAsian countries", The Himalayan Times, 2017. [Online]. Available: https://thehimalayantimes.com/business/nepals-revenue-gdp-ratio-highest-among-south-asian-countries/. [Accessed: 11- Apr- 2019].

[3]Worldpaymentsreport.com, 2018. [Online]. Available: https://worldpaymentsreport.com/wp-content/uploads/sites/5/2018/10/World-Payments-Report-2018.pdf. [Accessed: 11- Apr- 2019].

[4]"Taking a closer look at Norway's payment landscape", European Payments Council, 2018. [Online]. Available: https://www.europeanpaymentscouncil.eu/news-insights/insight/taking-closer-look-norways-payment-landscape. [Accessed: 11- Apr- 2019].

[5]s. suyoto, S. Megadewandanu and P. Pranowo, 2016. [Online]. Available: https://www.researchgate.net/publication/315363828_Exploring_mobile_wallet_adoption_in_Indonesia_using_UTAUT2_An_approach_from_consumer_perspective. [Accessed: 11- Apr- 2019].

[6]s. gupta, Hbs.edu, 2013. [Online]. Available: https://www.hbs.edu/faculty/Publication%20Files/The%20Mobile%20Banking%20and%20Payment%20Revolution1_b37fc319-e15f-46c8-b2f9-c0d4c8327285.pdf. [Accessed: 11- Apr- 2019].

[7]"Nepal slips 5 places in Doing Business index", The Himalayan Times, 2018. [Online]. Available: https://thehimalayantimes.com/business/nepal-slips-5-places-in-doing-business-index/. [Accessed: 11- Apr- 2019].

[8]A. Yadav, 2015. [Online]. Available: https://www.researchgate.net/publication/302666934_Contribution_of_Income_tax_and_Effects_on_Revenue_Generation_in_Nepal. [Accessed: 31- May- 2019].

APPENDIX

Pseudo code

```
@Override
public boolean onCreateOptionsMenu(Menu menu) {
    MenuInflater inflater=getMenuInflater();
    inflater.inflate(R.menu.example_menu,menu);
    return true;
}

@Override
public boolean onOptionsItemSelected(MenuItem item) {
    switch (item.getItemId()){
        case R.id.profile:
            Intent il=new Intent( packageContext: this, Profiled.class);
            this.startActivity(il);
            return true;
        case R.id.logout:
            Intent i2=new Intent( packageContext: this, LogOutActivity.class);
            this.startActivity(i2);
            return true;

        default:
            return super.onOptionsItemSelected(item);

    }

}
```

Screenshot-1: Dashboard

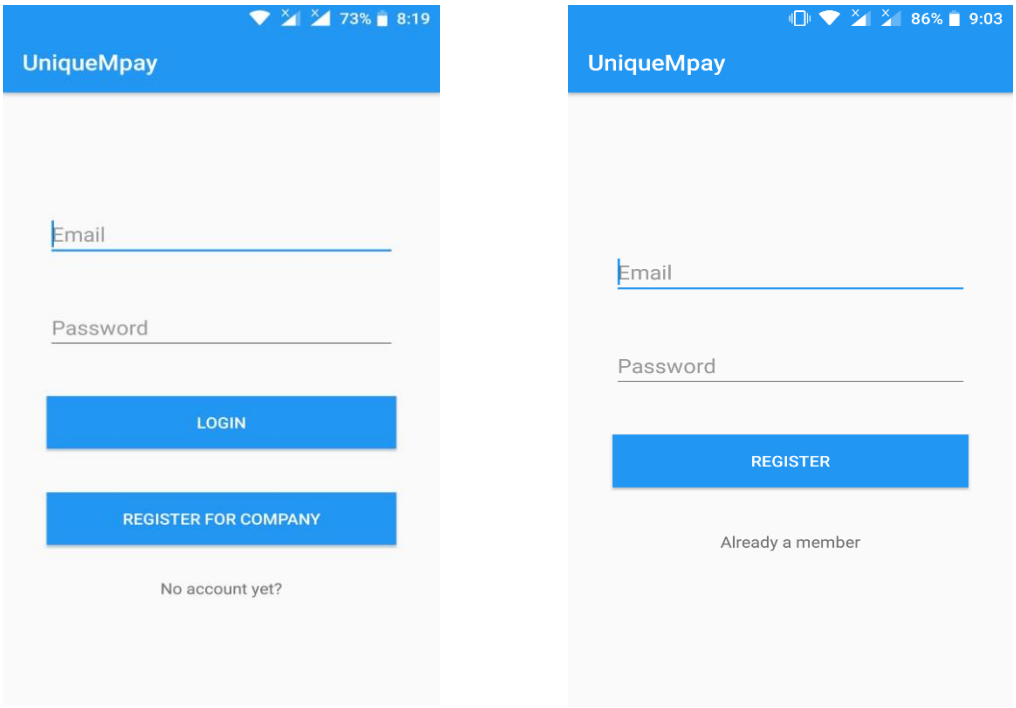
```
mAuth=FirebaseAuth.getInstance();
currentuserid=mAuth.getCurrentUser().getUid();
usersRef= FirebaseDatabase.getInstance().getReference( path: "users").child(currentuserid).child("Balance");

usersRef.addListenerForSingleValueEvent(new ValueEventListener() {
    @Override
    public void onDataChange(@NonNull DataSnapshot dataSnapshot) {
        long bal = Long.parseLong(name);
        long balance = Long.parseLong(dataSnapshot.getValue().toString());
        long amount = balance - bal;
        usersRef.setValue(amount);

    }

    @Override
    public void onCancelled(@NonNull DatabaseError databaseError) {
    }
});
```

Screenshot-2: Making Payments

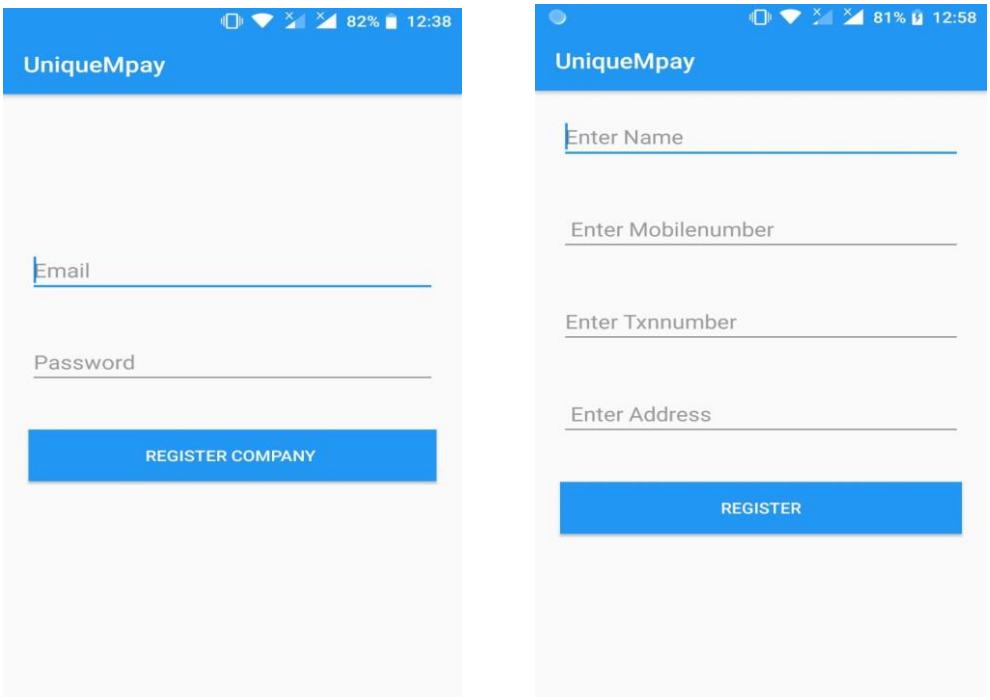
```
mAuth=FirebaseAuth.getInstance();
currentuserid=mAuth.getCurrentUser().getUid();
usersRef= FirebaseDatabase.getInstance().getReference().child("users").child(currentuserid);
usersRef.addValueEventListener(new ValueEventListener() {
    @Override
    public void onDataChange(@NonNull DataSnapshot dataSnapshot) {
        if (dataSnapshot.exists()){

            String user=dataSnapshot.child("username").getValue().toString();
            String balancee=dataSnapshot.child("Balance").getValue().toString();
            String mobile=dataSnapshot.child("phone").getValue().toString();
            a.setText("Username : " + user);
            b.setText("Balance : " + balancee);
            c.setText("Mobile : " + mobile);
        }

    }

    @Override
    public void onCancelled(@NonNull DatabaseError databaseError) {

    }
});
```

Screenshots 3: View account details

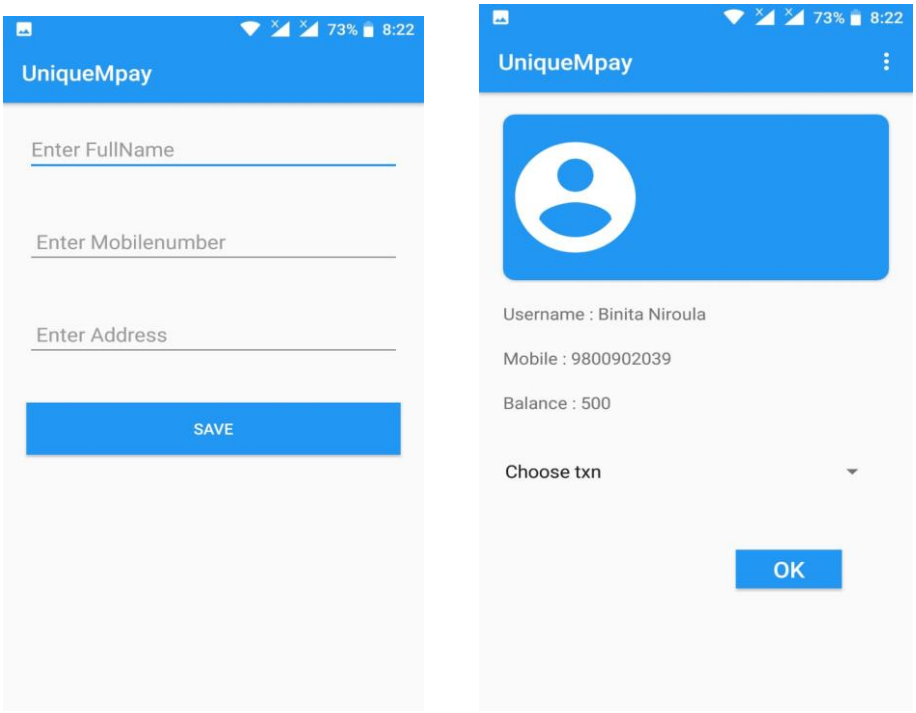
Android Screenshots



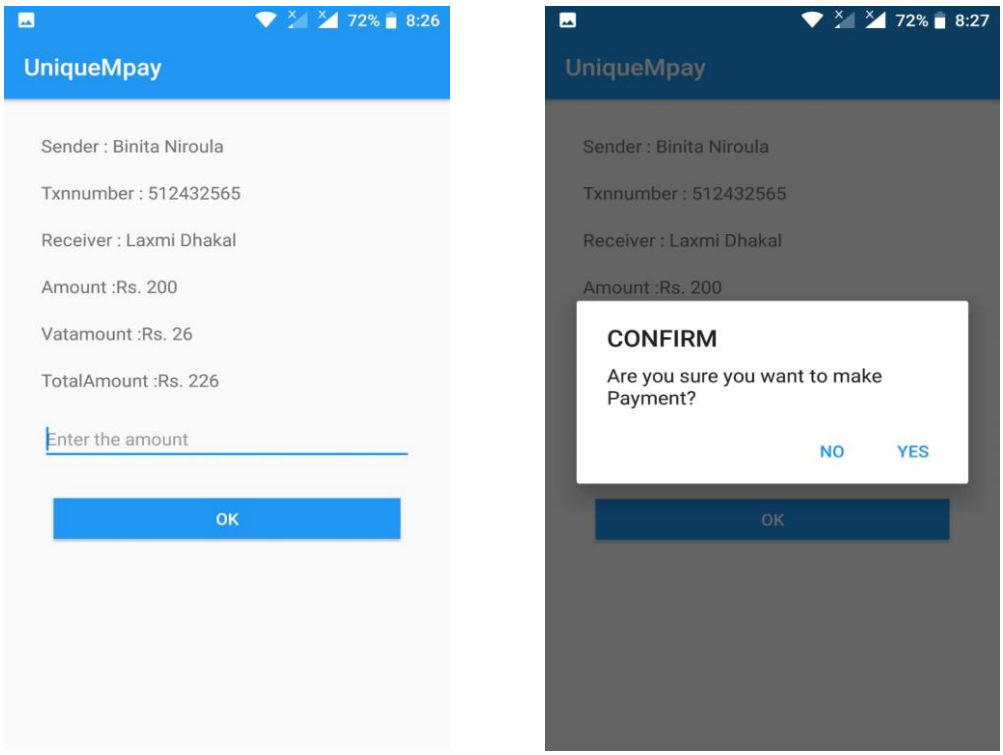
Screenshot 1: Login and Registration



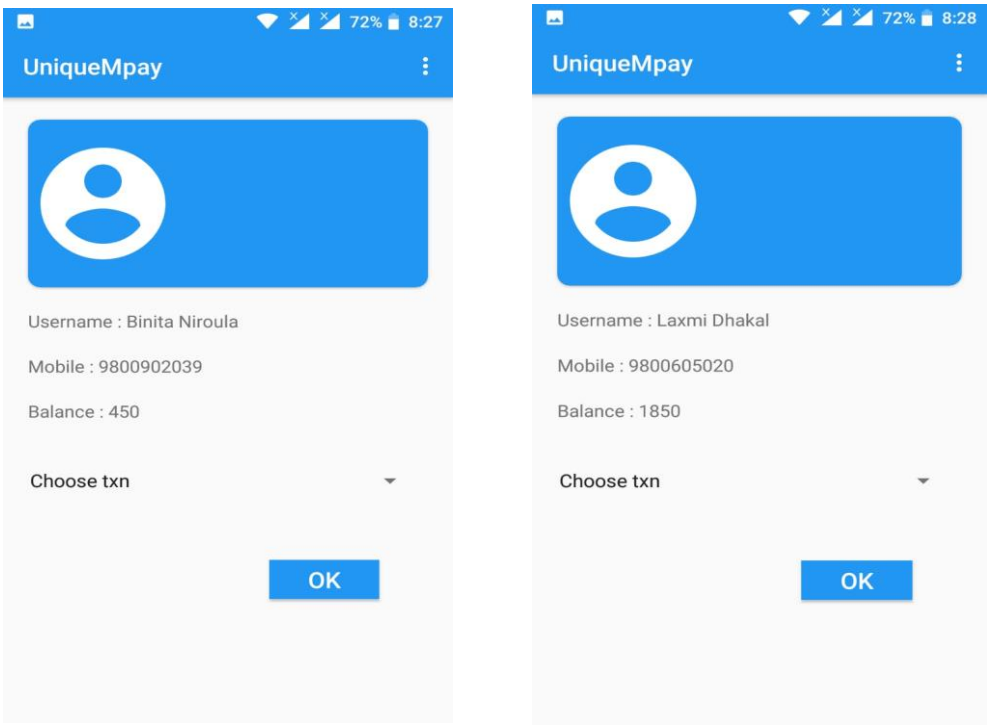
Screenshots 2: Admin Detail



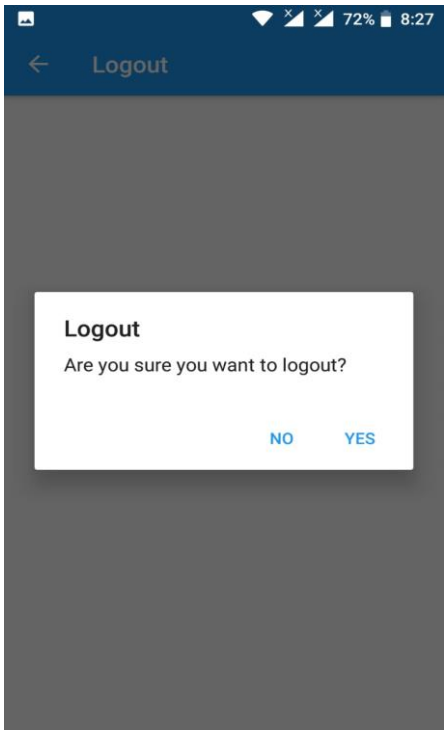
Screenshot 3: User input after registration and Dashboard



Screenshot 4: Enter amount and confirm payment



Screenshots 5: Sender details after payment and receiver details



Screenshot 6: Logout dialog box