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"Banking Database Management System"

Software Design Document submitted in partial fulfillment of curriculum prescribed for Software Engineering(CS520) for the award of the degree of

Bachelor Of Engineering

In

Computer Science And Engineering

by

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Contents

1 INTRODUCTION

The project titled "Banking management system" is a web based application that provides access to financial transactions in a public space without the need for a clerk or bank teller. Primary purpose of this project is to provide a customer with all the basic banking facilities on line without the need of going to bank physically.

This design document presents the designs used or intended to be used in implementing the project. The designs described, follow the requirements specified in the Software Requirements Specifications document prepared for the project.

1.1 Purpose

The purpose of this document is to present a detailed description of the designs of the Banking Management Database System. Firstly, this document is intended for the group in Team 5, to use the designs as guidelines to implement the project. Lastly, this document could be used for designers who try to upgrade or modify the present design of the inventory system.

1.2 Scope

This document gives a detailed description of the software architecture of the Banking Database System. It specifies the structure and design of some of the modules discussed in the SRS. It also displays some of the use cases that had transformed into sequential and activity diagrams. The class diagrams show how the programming team would implement the specific module.

1.3 References

The user of this SDD may need the following documents for reference: IEEE Standard 1016-1998, IEEE Recommended Practice for Software Requirements Specifications, IEEE Computer Society, 1998.

1.4 Overview

This document is written according to the standards for Software Design Documentation explained in "IEEE Recommended Practice for Software Design Documentation". Sections 3 – 5 contain discussions of the designs for the project with diagrams which includes Architectural Design, Component Design and Interface Design. Section 6 shows samples of UI from the system.

2 DESIGN CONSIDERATIONS

2.1 Assumptions

The user of the banking system is aware of basic operations of a computer and web pages. The user also understands the standard terms used for operation.

2.2 Constraints

The system is built accessible only through localhost. The system is implemented using NODE JS, Java Script, and MySQL.

2.3 System Environment

The web based banking management database system is designed to work on all operating systems. The system is accessible through any laptop and desktop. It is accessible at all times.

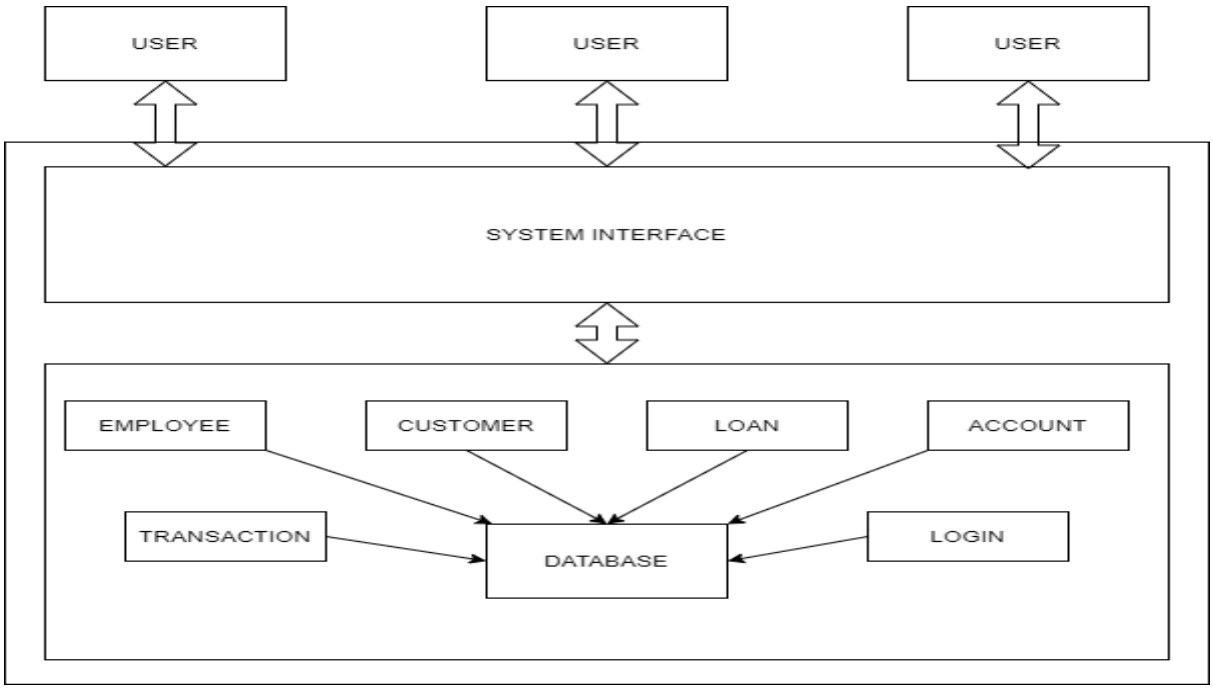
2.4 Design Methodology

The system is designed with flexibility for further development and/or modification. The system is divided into manageable processes that are grouped to sub-modules and modules that are built with abstraction.

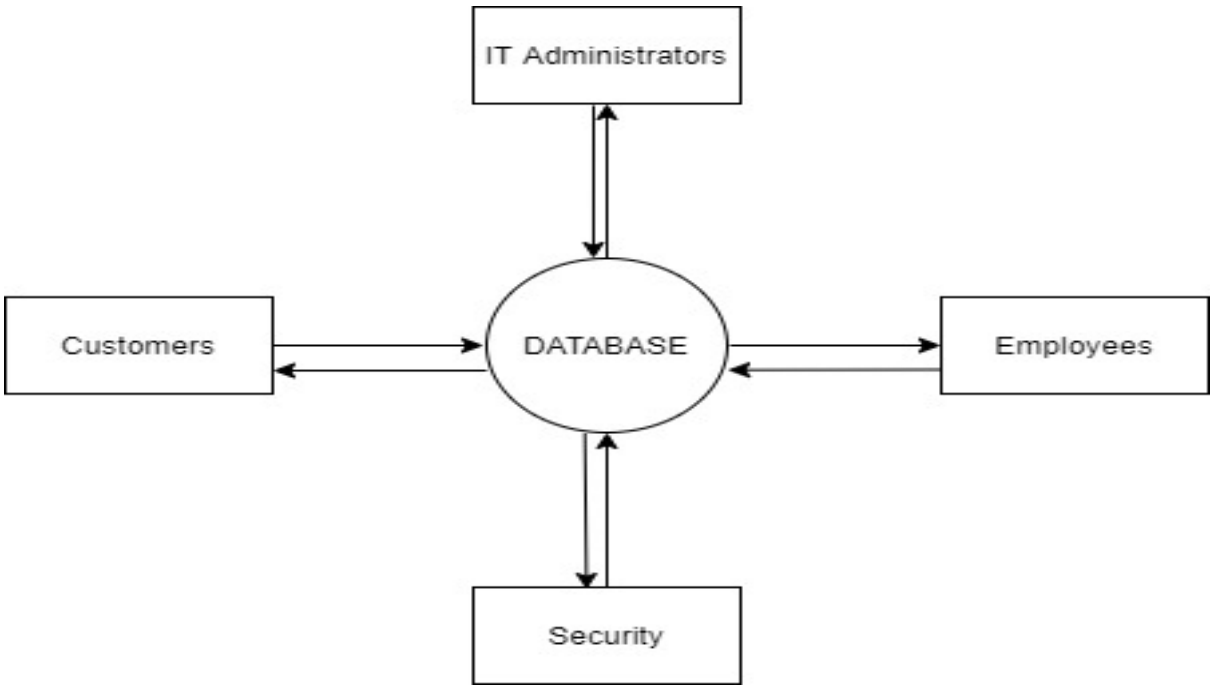
3 ARCHITECTURAL DESIGN

3.1 System Design

Our system uses data-centric architecture. The block diagram below shows the principal parts of the system and their interaction



Here, multiple users are interacting with the database concurrently. System interface separates these users from one another and provide them functionalities according to their position in the bank. Further, all the data is stored in a central system database where all the relations and relationships have been defined. Users interact with the database via user interface. This kind of system allows us to impose restrictions on the actions of a user and regulate the flow of data.
The context diagram shows the main actors as well as workers interacting with the system.



The actors in the scene:

- Customers
- Employees

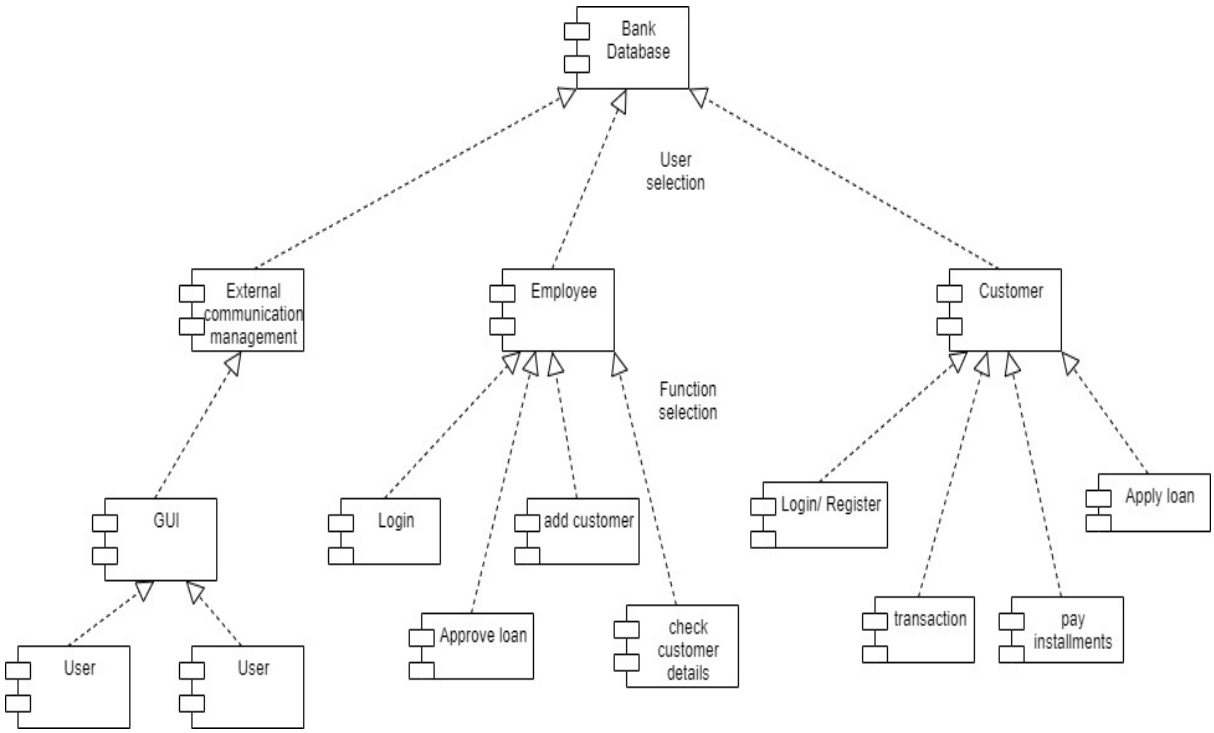
The actors have limited access to the database. They can interact with only a part of the database. They could also be called as end users since they only interact with GUI without any knowledge of the internal working of database.

The workers behind the scene:

- IT administrators
- Security

The workers usually have access to almost entire database (excluding certain conditions). Even for the workers, an access level has to be defined. Otherwise, it leads to security breach. Administrators monitor the actions of end users and make changes based on user request. They can also modify the database as well as entire system if there is a need. Basically, they control the system. Security team is needed when certain events such as data breach or catastrophe occur.

Refining architecture into components, we obtain the following top-level components:-



In the above UML diagram, user selection is divided as customer and employee. Further functionalities are provided for both. When a user interacts with GUI, GUI in turn interacts with external communication manager requesting access for database. Upon checking the position of user, user is allowed to login as either employee or as customer. Now, user can access the functionalities provided to him/her.

4 DATA DESIGN

4.1 Data Description

MySQL database,the local server and NODE JS communicate with the database that is installed locally on the system.

4.2 Data Dictionary

The tables(relations) in the database are: -

- **Customer**

Attributes	Data Type	Null
Account No	int	not null
First Name	varchar(25)	not null
Last Name	varchar(25)	not null
Address	varchar(50)	not null
DOB	Date	Yes
Sex	varchar(10)	not null
Phone-no	int	not null
Profession	varchar(20)	Yes
Balance	int	Yes
Email	varchar(25)	not null
Add By Employee	int	not null
Type-id	int	not null

- **Employee**

Attributes	Data Type	Null
Employee Id	int	not null
Employee Name	varchar(25)	not null
Position	varchar(15)	not null
Salary	int	not null
Super-Id	int	Yes
Email	varchar(25)	not null

- **Customer Login**

Attributes	Data Type	Null
Customer-Id	int	not null
Email	varchar(25)	not null
Password	varchar(30)	not null

- **Employee Login**

Attributes	Data Type	Null
Employee-Id	int	not null
Email	varchar(25)	not null
Password	varchar(30)	not null

- **Account**

Attributes	Data Type	Null
Type-Id	int	not null
Account-Type Name	varchar(25)	not null

- **Transactions**

Attributes	Data Type	Null
Transaction-Id	varchar(25)	not null
Sending From	int	not null
Sending To	int	not null
Amount	int	not null
Transaction-Type	varchar(15)	not null
Transaction-Time	time-stamp	Yes

- **Feedback**

Attributes	Data Type	Null
Feedback-Id	int	not null
Customer-Id	int	not null
Customer-experience	varchar(50)	not null
Complaint	varchar(25)	not null

- **Loan**

Attributes	Data Type	Null
Loan-Type-Id	int	not null
Loan Type	varchar(25)	not null
Rate of Interest	int	not null

- **Loan Application**

Attributes	Data Type	Null
Application-Id	int	not null
Customer-Id	int	not null
Employee-Id	int	not null
Approval Status	varchar(15)	not null
Sanction Date	date	Yes
Duration	int	Yes
Principal Amount	int	not null
Loan-Type-Id	int	not null

- **Loan Paid**

Attributes	Data Type	Null
Application-Id	int	not null
Customer-Id	int	not null
Paid Date	date	Yes
Paid Amount	int	not null
Due Date	Date	Yes
Due Amount	int	not null

5 COMPONENT DESIGN

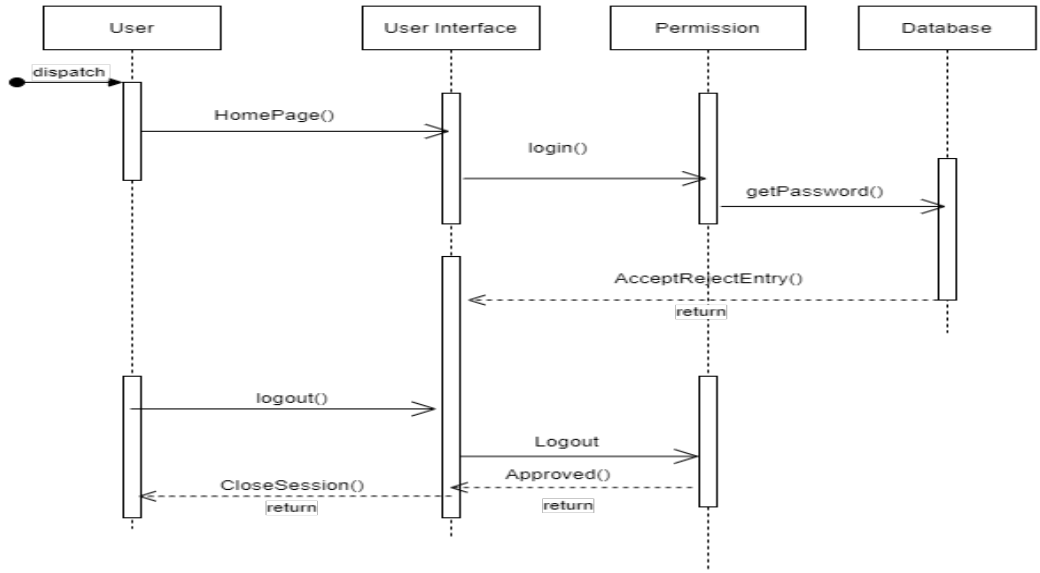
The following are the component design diagrams for various components and web-pages of ”Banking Database Management System”.

5.1 Common Components

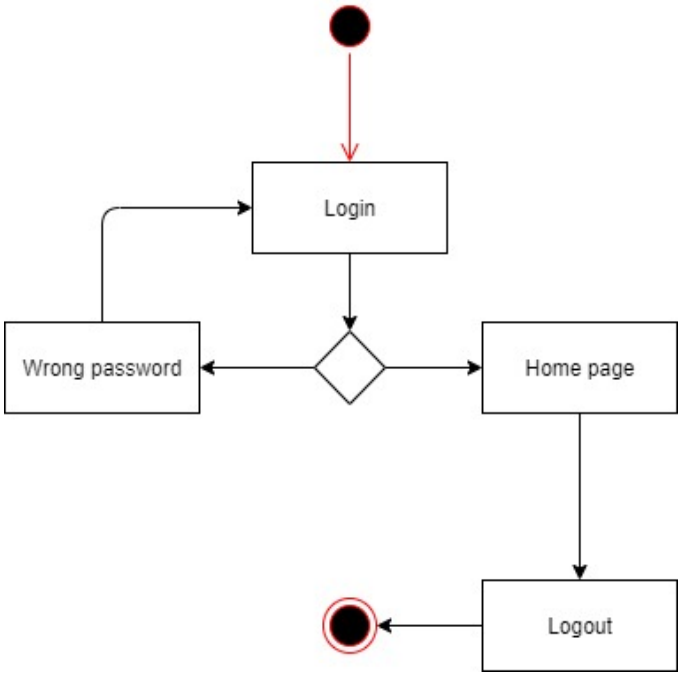
These are the common components for both customer and administrator:-

5.1.1 Login Page

Sequence Diagram for Login

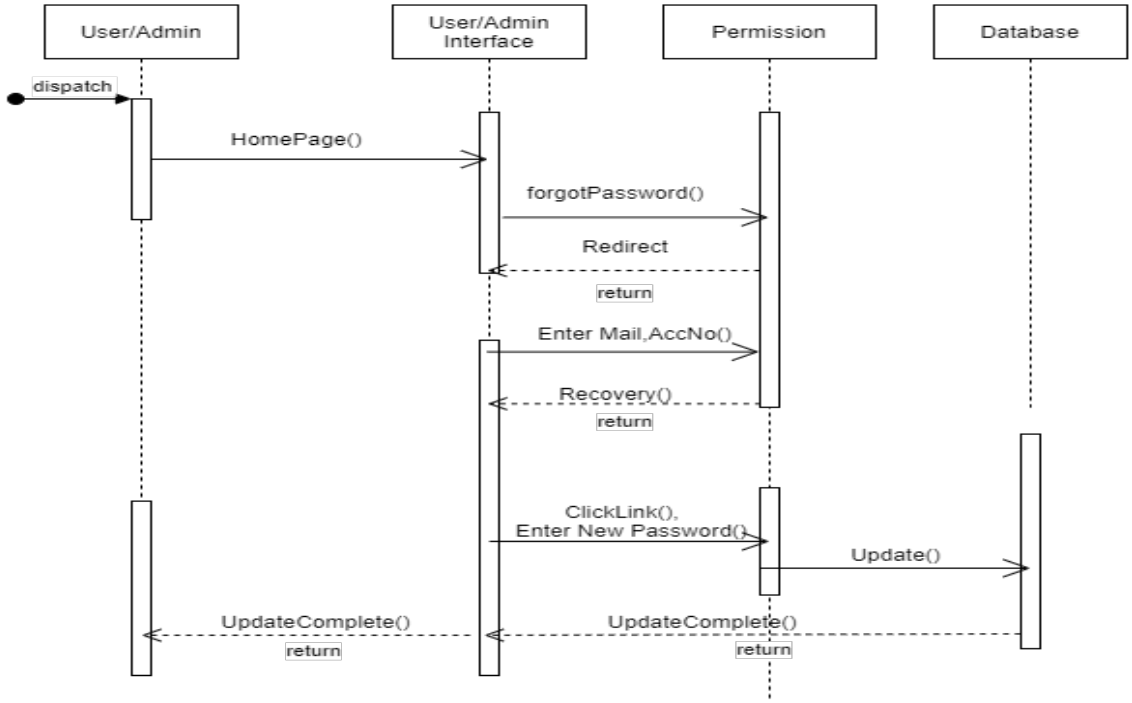


Activity Diagram for Login

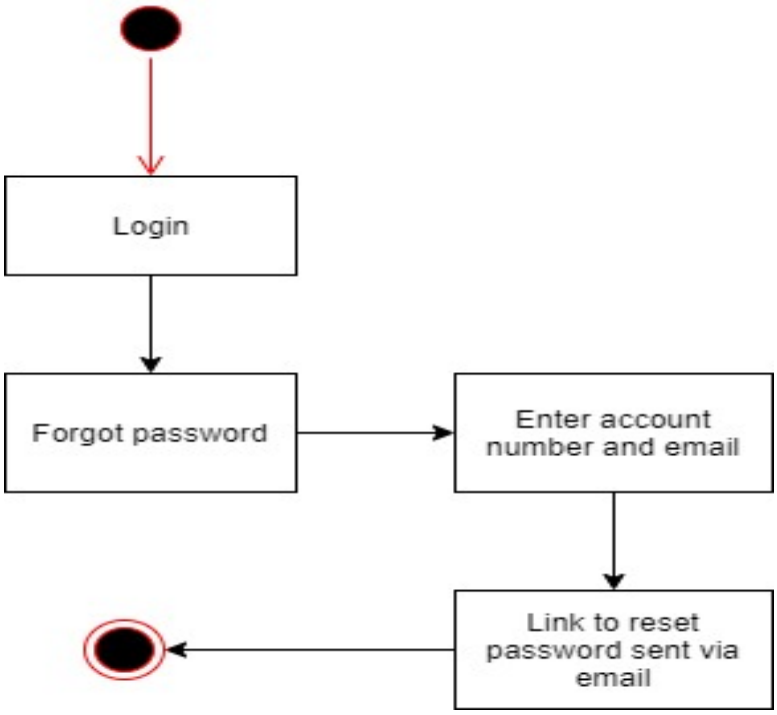


5.1.2 Forgot Password

Sequence Diagram for Forgot Password



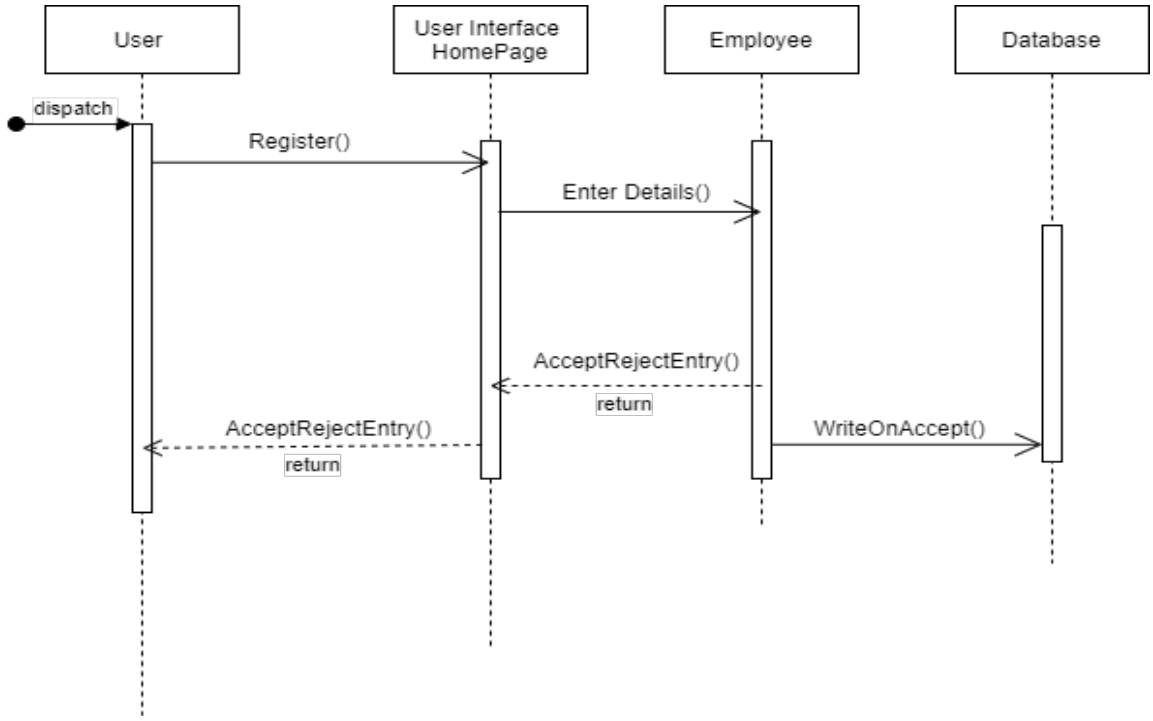
Activity Diagram for Forgot Password



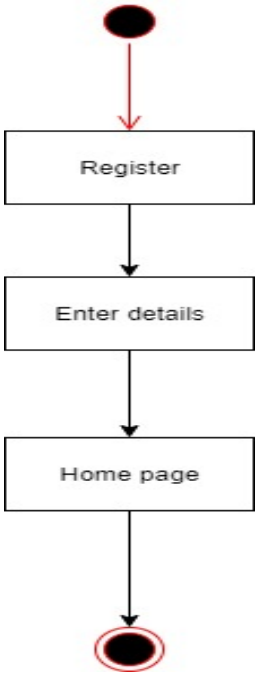
5.2 User Components

5.2.1 Register New Customer

Sequence Diagram for Registration to create new account

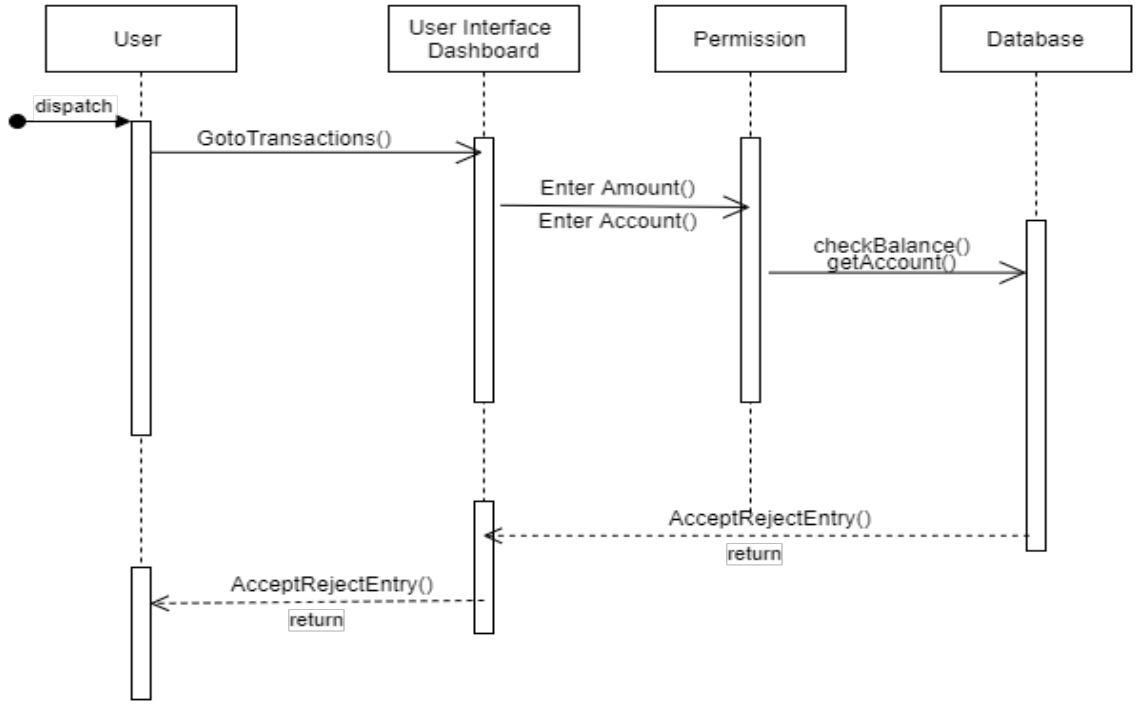


Activity Diagram for Registration to create new account

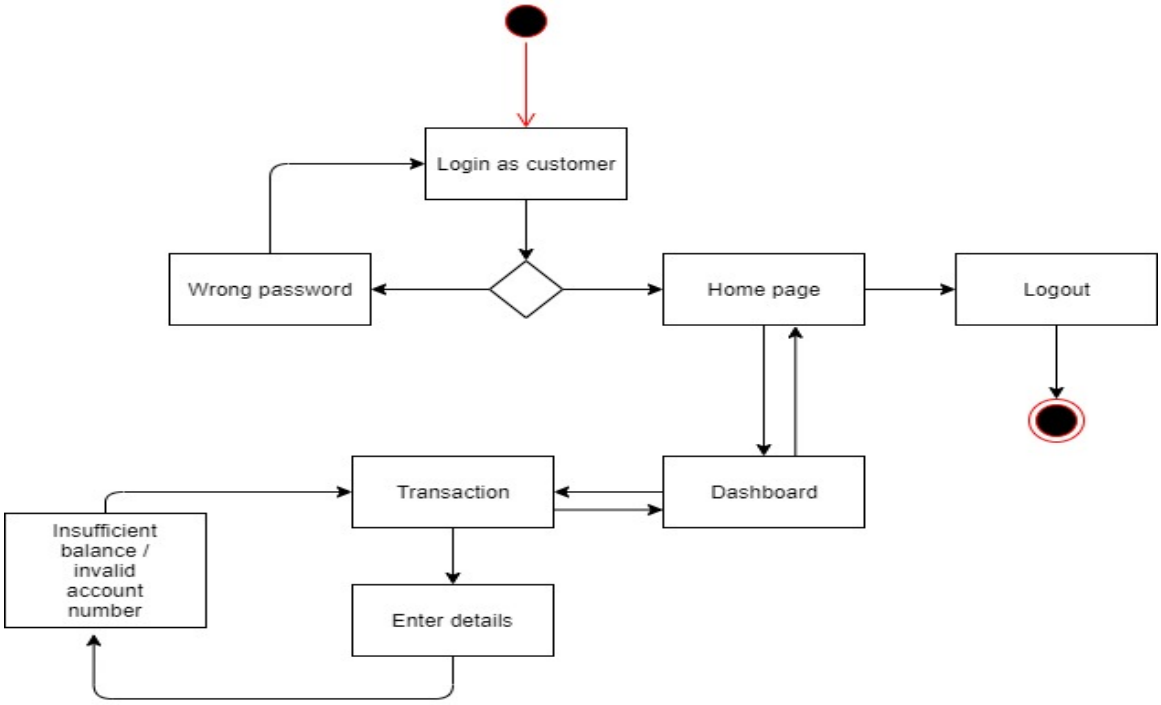


5.2.2 Transactions

Sequence Diagram for transactions done by Customer

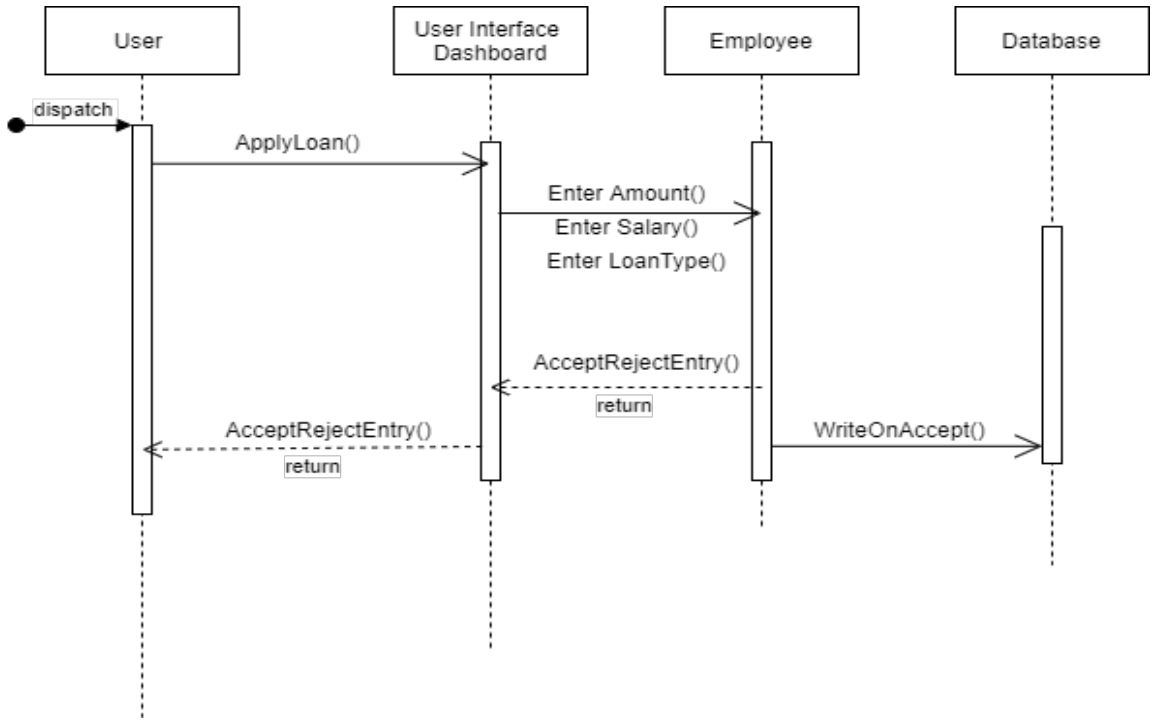


Activity Diagram for transactions done by Customer

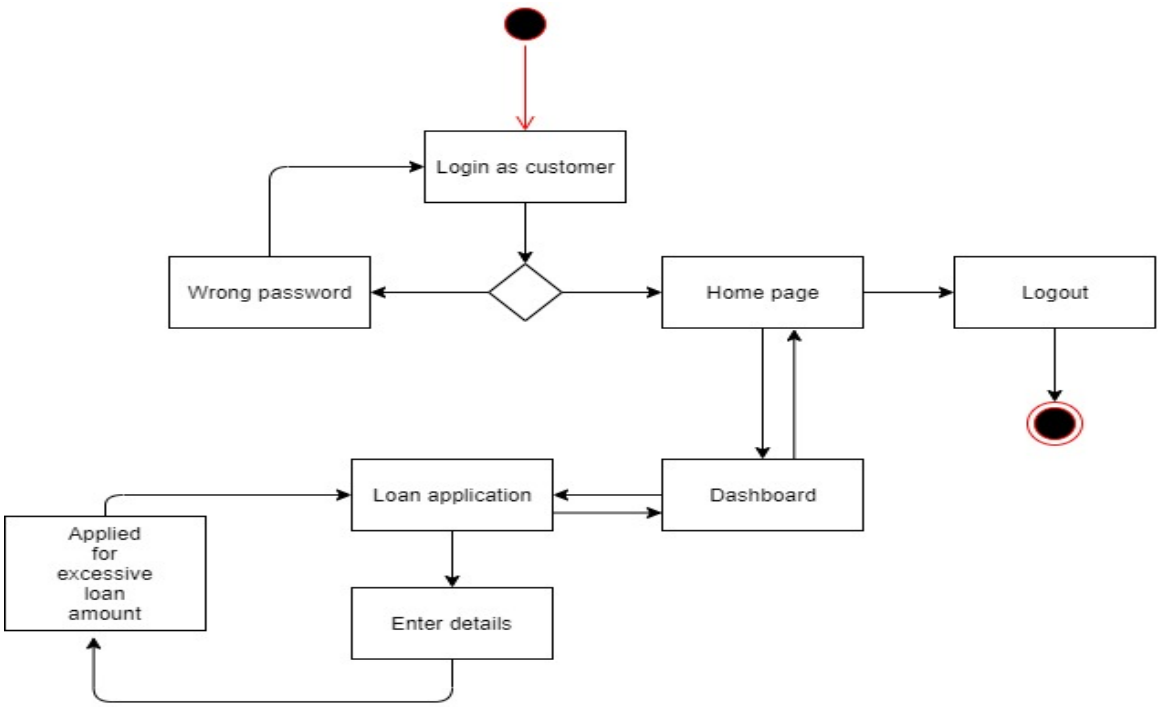


5.2.3 Apply For Loan

Sequence Diagram for Loan Availed by Customer



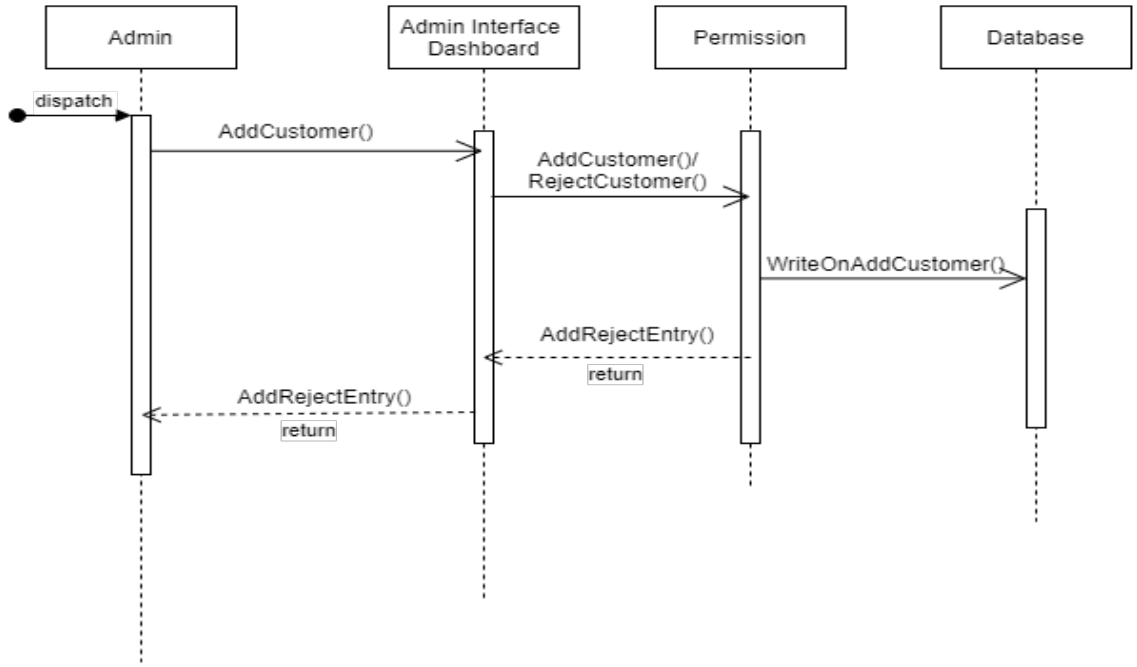
Activity Diagram for Loan Availed by Customer



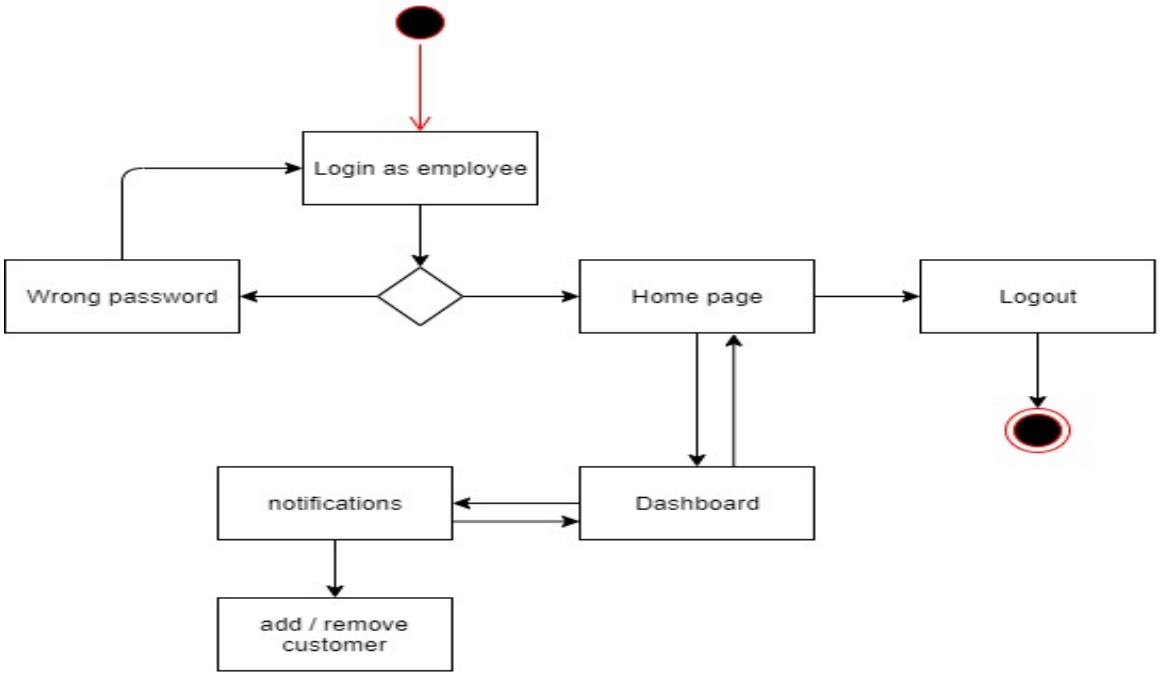
5.3 Administrator Components

5.3.1 Approving a New Customer

Sequence Diagram for Customer approved by Admin

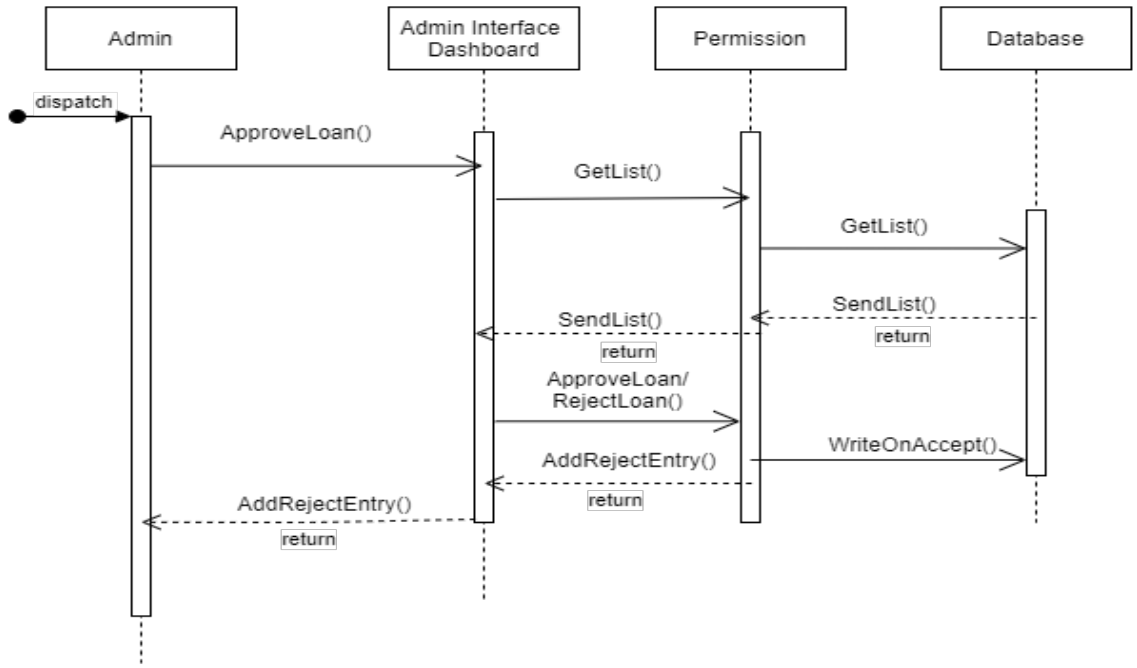


Activity Diagram for Customer approved by Admin

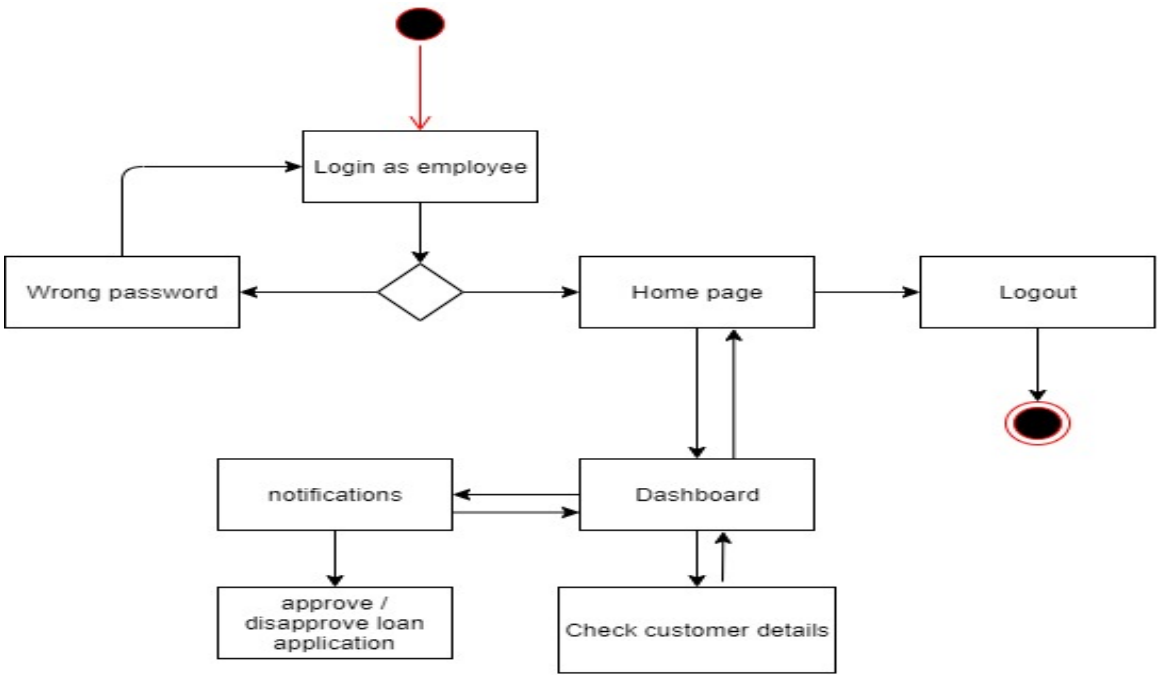


5.3.2 Approving a Loan Application

Sequence Diagram for Loan approved by Admin



Activity Diagram for Loan approved by Admin



6 SOFTWARE INTERFACE DESIGN

6.1 User Interface Design

UI is designed according to the following design principles:-

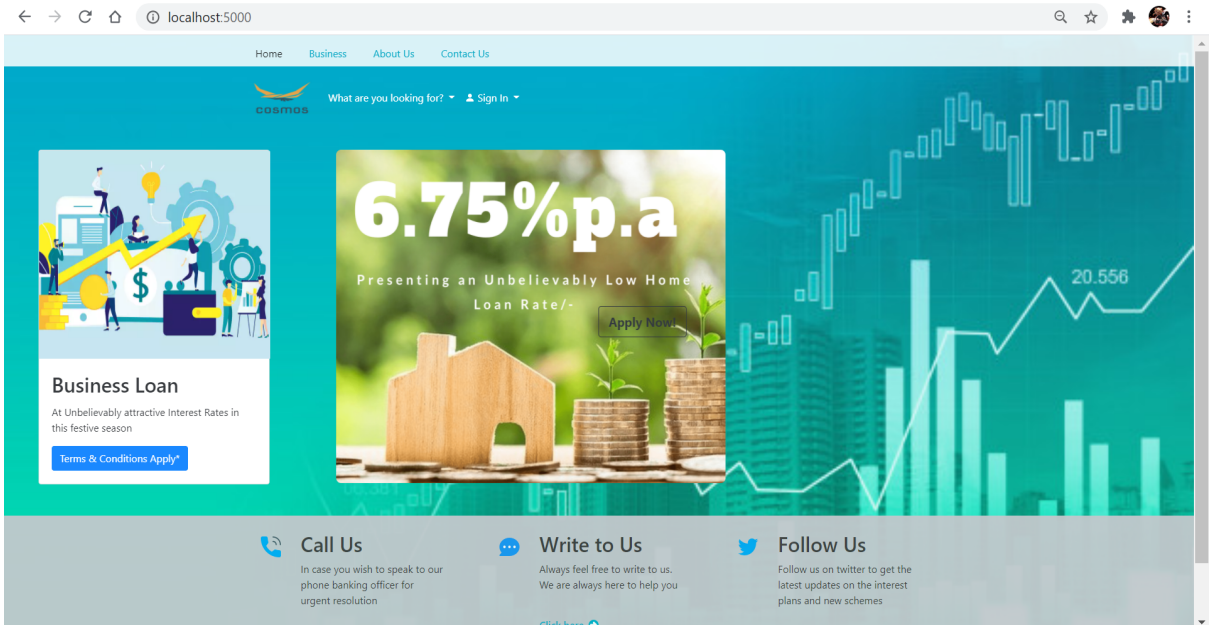
- The structure principle: UI is organized in such a way that related things are combined together and unrelated things are separated.
- The simplicity principle: It is easy to follow the provided interface. In case of mistake, system displays error message.
- The visibility principle: All system functions are available through UI. It does not overwhelm users with too many alternatives.
- The feedback principle: Through the system of messages, the design keeps users informed of actions, errors, or exceptions.
- The reuse principle: In design, same names were used to perform the same operations with different objects in order to reduce ambiguity.

The "Banking Management System" Software is an independent web-based application. There are various interfaces related to the database management system. These interfaces help the user to interact with the software and provide necessary information for online banking.
The following are the interfaces :

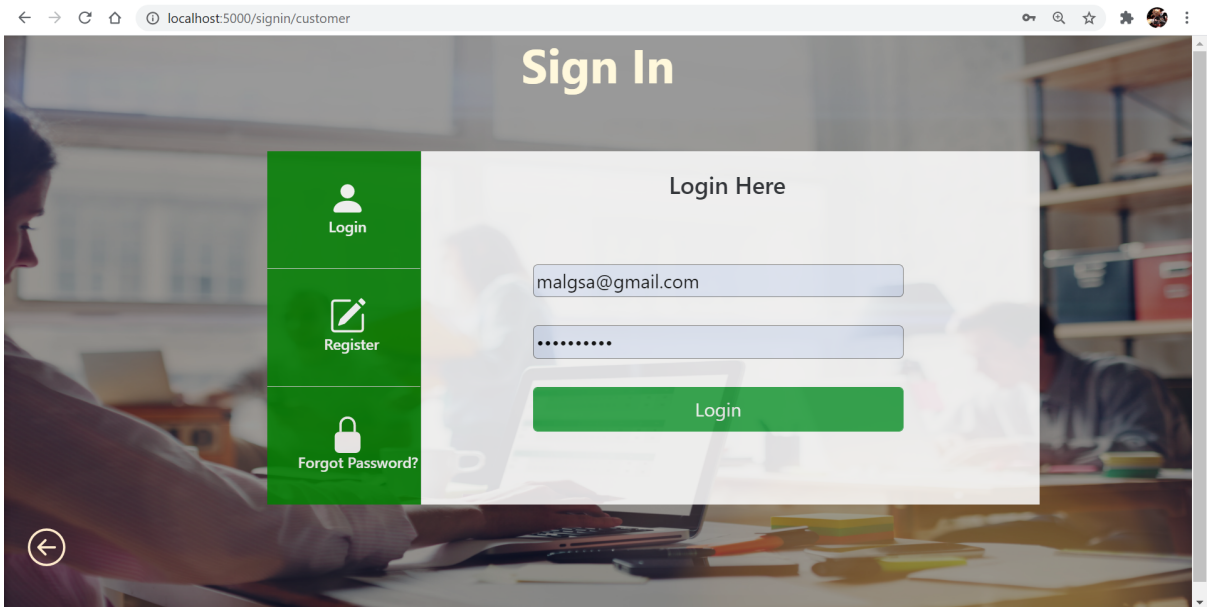
6.1.1 Client Interface

The client will have client interface in which he/she can interact with the banking system. It is a web-based interface which will be the web page of the banking application. The home page is displayed with the various options and services provided by the bank. The following images show the interface:-

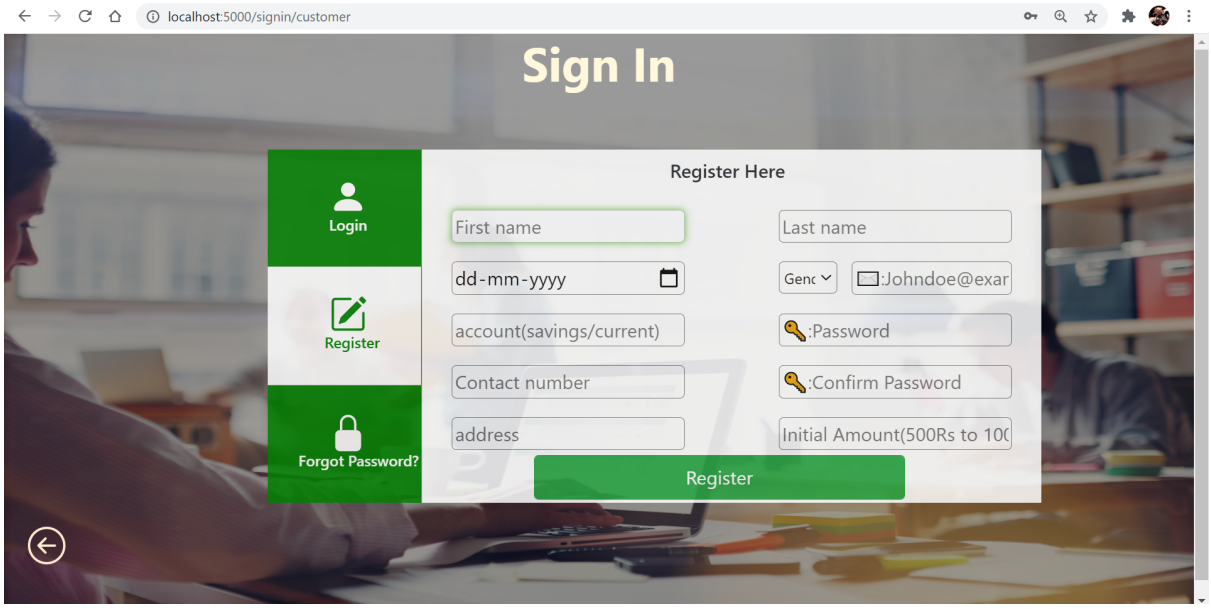
1. HOME PAGE / AFTER LOGOUT PAGE



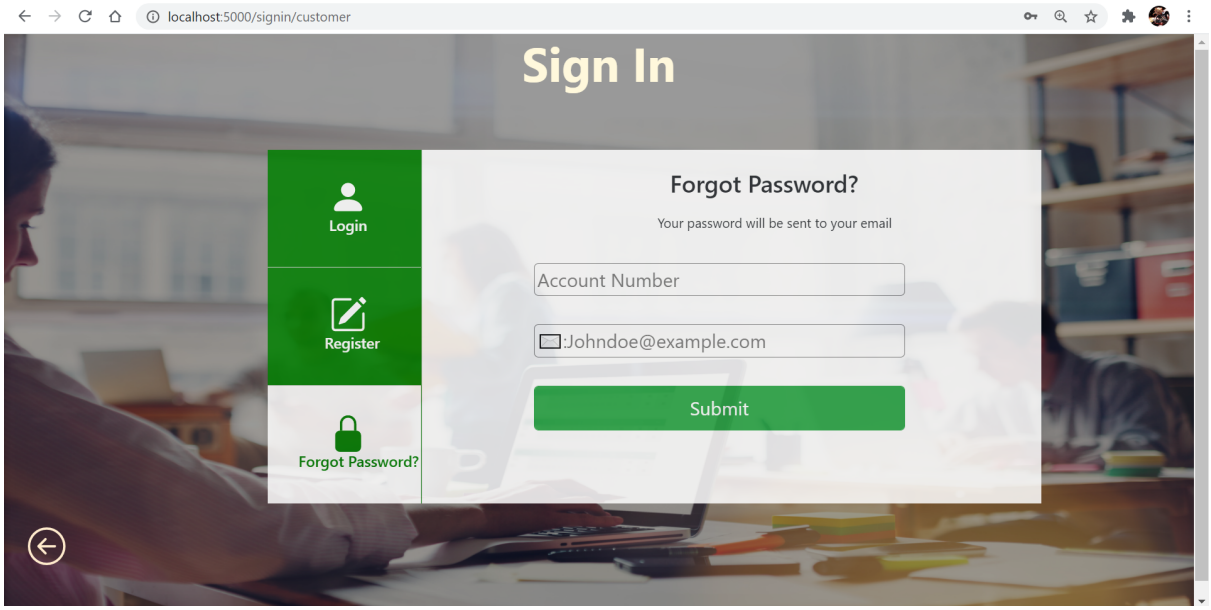
2. CUSTOMER LOGIN PAGE



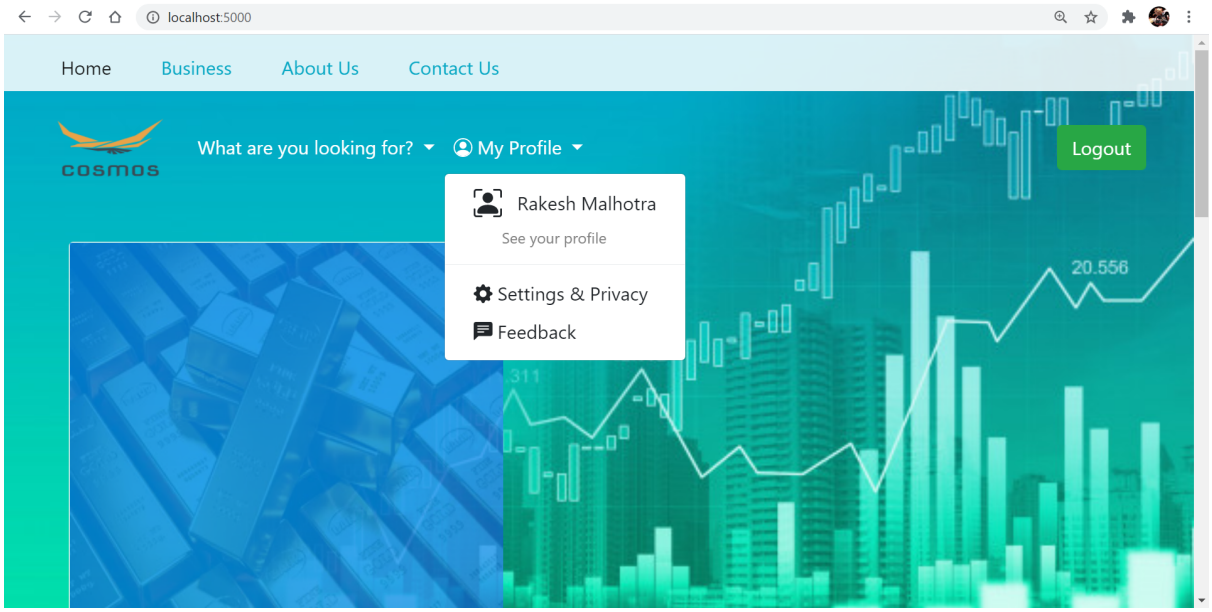
3. CUSTOMER REGISTRATION PAGE



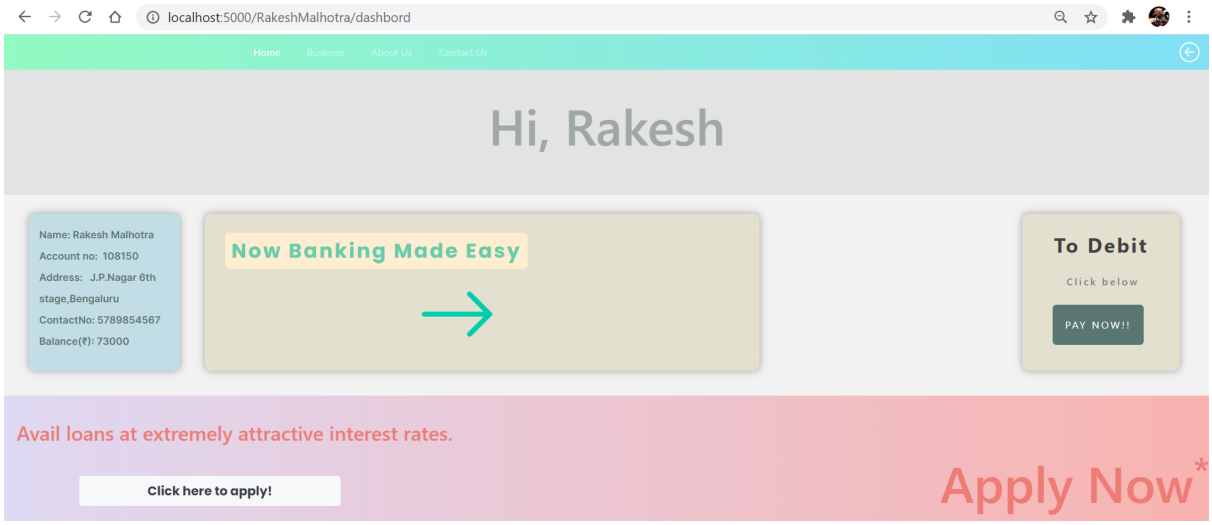
4. FORGOT PASSWORD PAGE



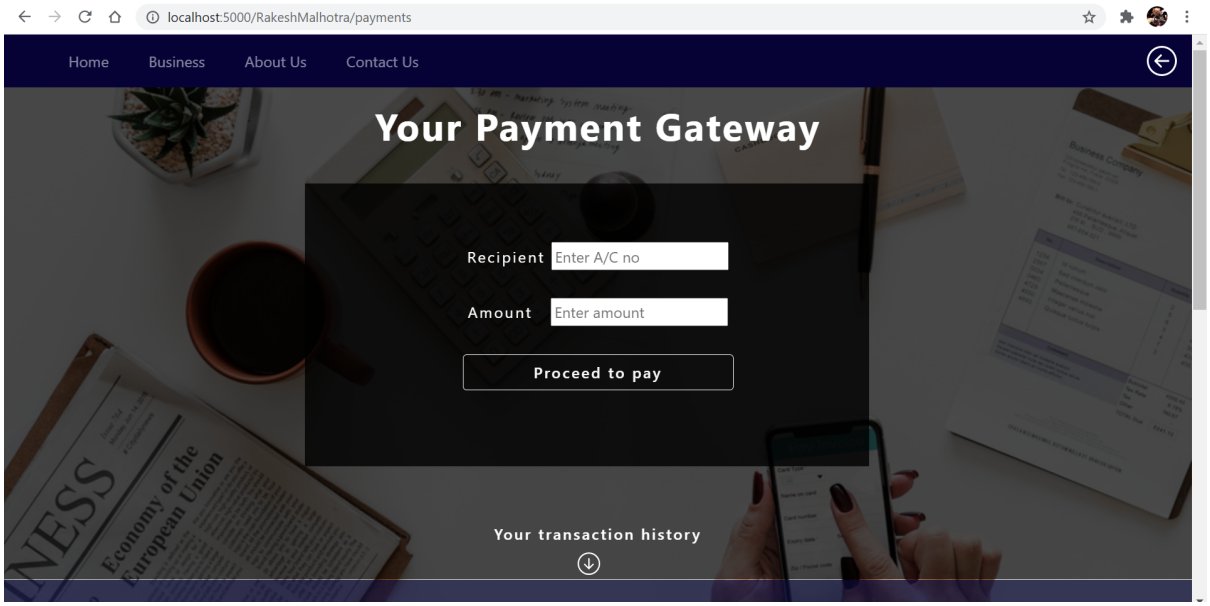
5. CUSTOMER HOME PAGE

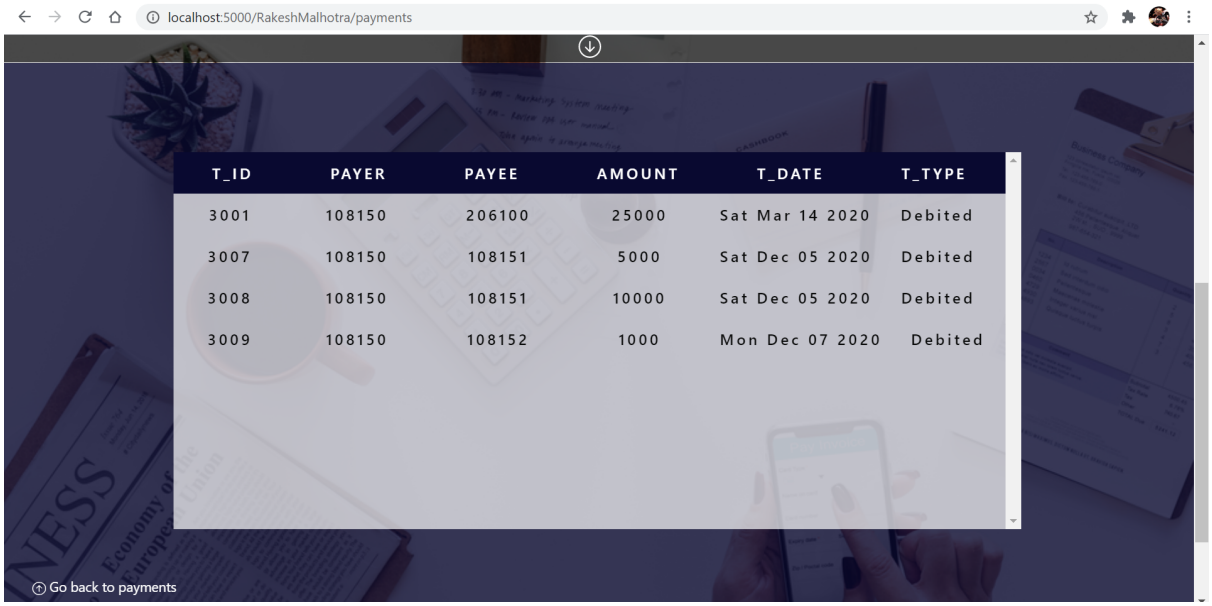


6. CUSTOMER DASHBOARD PAGE

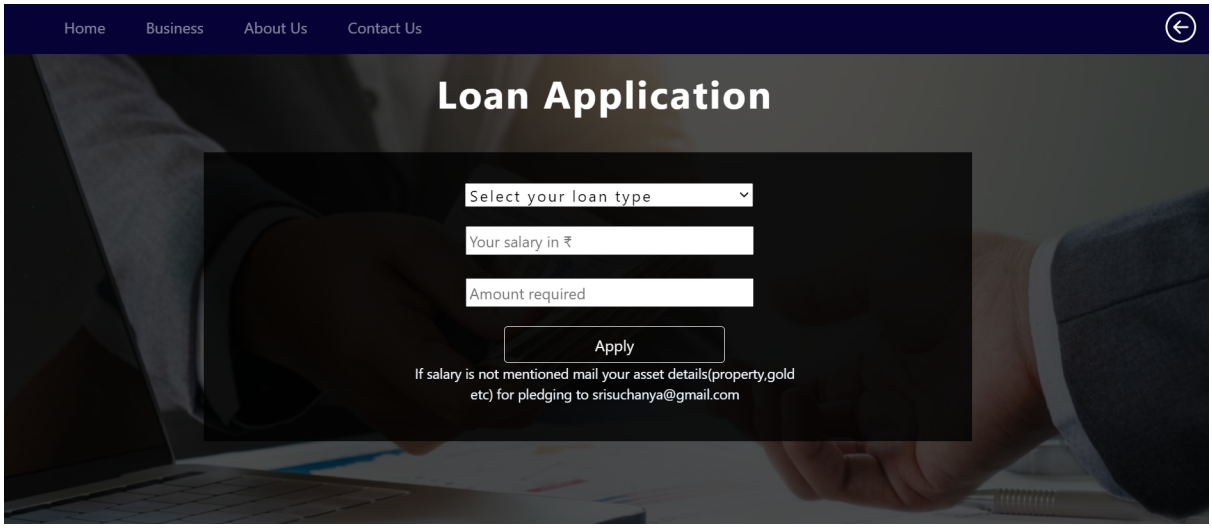


7. CUSTOMER TRANSACTION PAGE





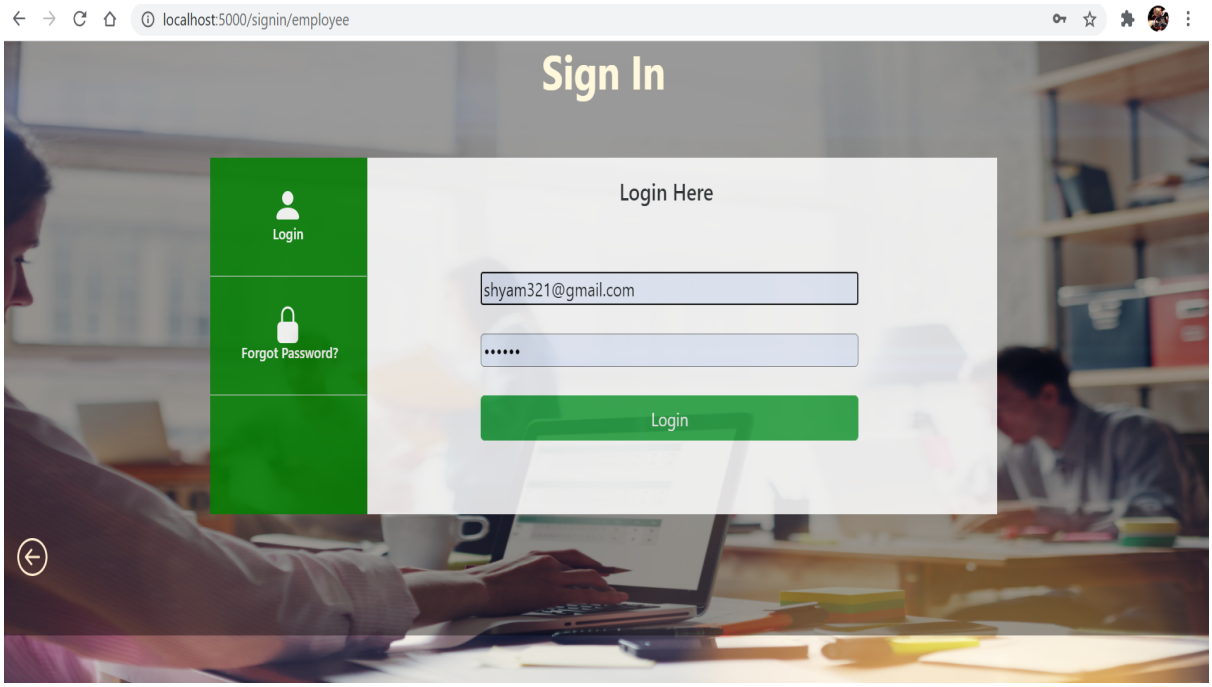
8. LOAN APPLICATION PAGE



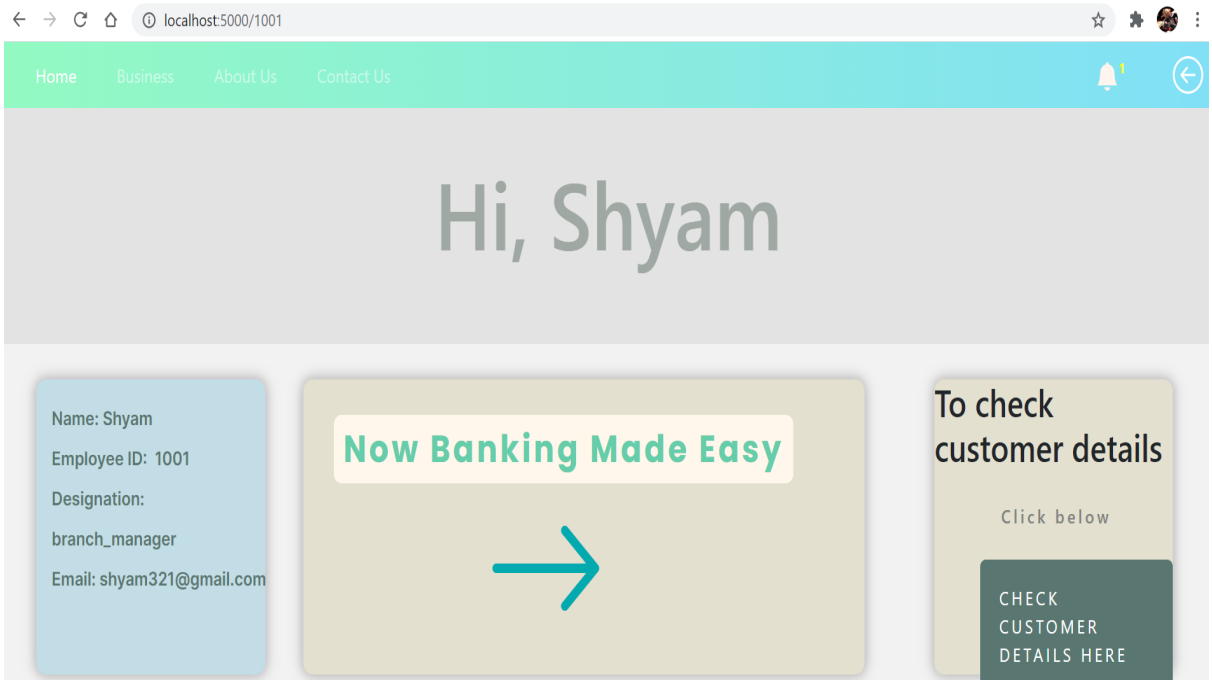
6.1.2 Administrative Interface

The administrator will have an administrative interface which is a GUI so that he/she can view the entire system. It is a web-based interface which will be the web page of the banking application. The home page has a dashboard which has login option. Choosing login option redirects to login page where the user can enter the login details.On successful login dashboard is displayed with the various options for job of administrator.The following images show the interface:-

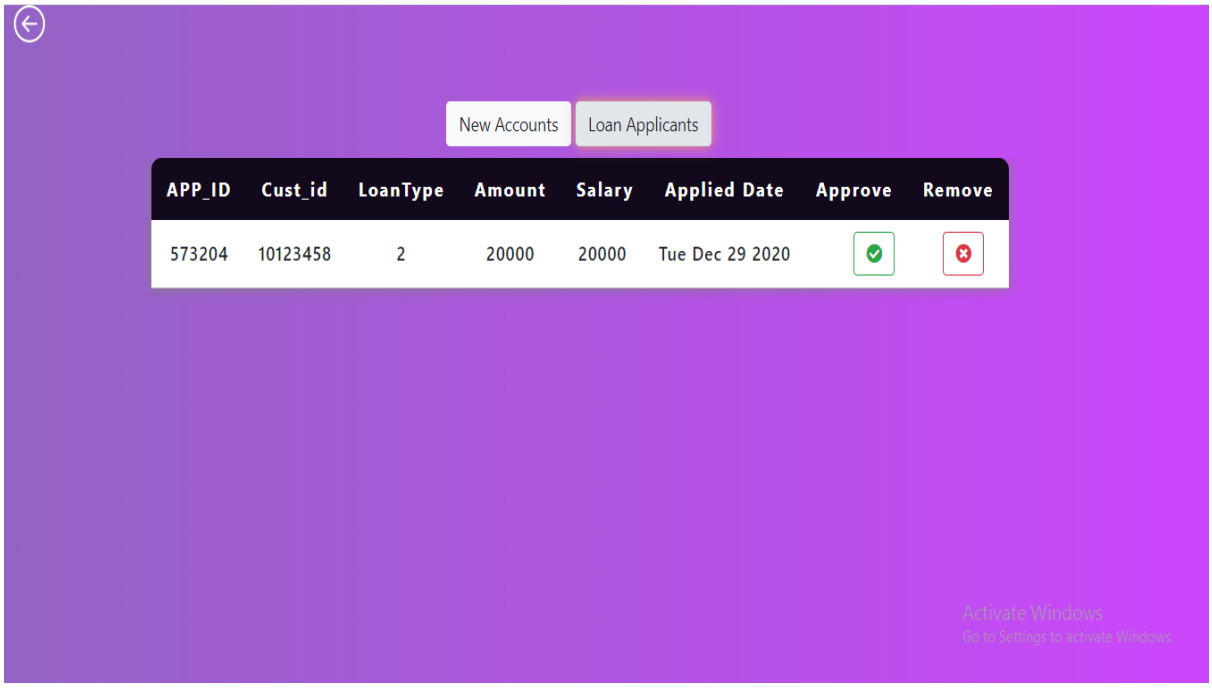
1. EMPLOYEE LOGIN



2. EMPLOYEE DASHBOARD



3. LOAN APPROVAL/ADD CUSTOMER PAGE



6.1.3 Working of Interface Pages

The diagram below, gives overview of the web pages and the order in which they are accessible.