EXPENSE MANAGER

A PROJECT REPORT

Submitted by

VAIBHAV J ADESARA

191260107001

In partial fulfillment for the award of the degree of

BACHELOR OF ENGINEERING

in

Computer Engineering

Sal Engineering and Technical Institute, Ahmedabad

Gujarat Technology University, Ahmedabad

May, 2023

Sal Engineering and Technical Institute

Sola Bridge Road, Ahmedabad, Gujarat-380060

CERTIFICATE

This is to certify that the project report submitted along with the project entitled **Expense Manager** has been carried out by **Vaibhav J Adesara (191260107001)** under my guidance in partial fulfillment for the degree of Bachelor of Engineering in **Computer Engineering**, 8th Semester of Gujarat Technological University, Ahmedabad during the academic year **2022-23**.

Prof. Hiral Prajapati
Internal Guide

Dr. Ajay Upadhyaya
In-charge Principal

Head of the CE, IT & ICT Department

Date: - 03/05/2023

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Vaibhav** has successfully completed internship in our organization as an intern **Java** for the duration of **12 Weeks**.

He/She has worked on project title **Expense Manager**.

During this tenure, we found that candidate is hardworking, conscientious & a responsible intern. The feedback of him/her participation has always been positive and we wish him/her all the best in future.

For, Unnati Informatics LLP

Huzefa Shakir
(Authorised Signature)

306, Unnati Informatics LLP, Hir asha arcade Sagar Sangeet apartment Sola, Ahmedabad
www.unnatiinformatics.com, 9998548080, Hr@unnatiinformatics.com

GUJARAT TECHNOLOGICAL UNIVERSITY

CERTIFICATE FOR COMPLETION OF ALL ACTIVITIES AT ONLINE PROJECT PORTAL

B.E. SEMESTER VIII, ACADEMIC YEAR 2022-2023

Date of certificate generation : 10 May 2023 (19:49:54)

This is to certify that, ***Adeshara Vaibhav Jitendra kumar*** (Enrolment Number - 191260107001) working on project entitled with ***Expense Manager*** from ***Computer Engineering*** department of ***SAL ENGINEERING & TECHNICAL INSTITUTE, SOLA, AHMEDABAD*** had submitted following details at online project portal.

Internship Project Report	**Completed**

Name of Student : Adeshara Vaibhav Jitendra kumar

Name of Guide : Miss. Hiral Darshan Prajapati

Signature of Student : _____

*Signature of Guide : _____

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Sal Engineering and Technical Institute

Opp. Science City,
Sola Bridge Road, Ahmedabad, Gujarat-380060

DECLARATION

We hereby declare that the Internship report submitted along with the project entitled **Expense Manager** submitted in partial fulfillment for the degree of Bachelor of Engineering in Computer to Gujarat Technological University, Ahmedabad, is a Bonafede record of original project work carried out by me at Unnati informatics LLP under the supervision of Prof. Hiral Prajapati and that no part of this report has been directly copied from any students' reports or taken from any other source, without providing due reference.

Name of the Student	Sign of Student
Vaibhav J Adesara	_____

ACKNOWLEDGMENT

I would like to express my deepest gratitude to all the individuals who have made my internship a truly rewarding experience. Their guidance, support, and encouragement have been invaluable in shaping my professional growth and enhancing my understanding of the industry. I am indebted to each and every one of them for their contributions to my development.

First and foremost, I extend my heartfelt appreciation to my HOD Dr. Ajay Upadhaya and my internal guide Prof. Hiral Prajapati, for their unwavering guidance and mentorship throughout my internship journey. Their expertise, patience, and willingness to share their knowledge have been instrumental in broadening my horizons and refining my skills. I am grateful for their constant encouragement and belief in my abilities.

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In conclusion, I am immensely grateful for the opportunity to be part of this internship program. The knowledge, skills, and relationships I have gained during this time will undoubtedly shape my future endeavors. Once again, I extend my heartfelt appreciation to everyone who has played a part in making my internship a truly enriching and memorable experience.

Yours sincerely,

Vaibhav Adesara

(191260107001)

ABSTRACT

Personal finance management is an important part of people's lives. However, everyone does not have the knowledge or time to manage their finances in a proper manner. And, even if a person has time and knowledge, they do not bother with tracking their expenses as they find it tedious and time-consuming. Now, we don't have to worry about managing our expenses, as we can get access to an expense tracker that will help in the active management of our finances.

People tend to overspend without realizing it, which can be disastrous. Using a daily expense manager can help us keep track of how much we spend every day and on what. At the end of the month, we will have a clear picture of where our money is going. This is one of the best ways to get our expenses under control and bring some semblance of order to our finances.

Expense Manager is a web-based application that helps users keep track of their expenses and manage their finances efficiently. The application provides users with a platform to enter and track their expenses. It also generates reports and charts to help users visualize their spending patterns and make informed financial decisions.

The system has two modules: the customer module and the admin module. The customer module allows users to create an account, add and manage their expenses, set budgets, and receive alerts. The admin module allows the system administrator to manage users, Vendors, Categories, Subcategories and services, and reports. The system is built using JSP and Spring Boot technologies, with a MySQL database.

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ABBREVIATIONS

SDLC	Software Development Life Cycle
JSP	Java Server Pages
STS	Spring Tool Suite
GUI	Graphical User Interface
UI	User Interface
SQL	Structured Query Language
HTML	Hypertext Markup Language
CSS	Cascading Style Sheets
JS	JavaScript
Java	A programming language commonly used for enterprise applications.

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OVERVIEW OF THE COMPANY

1.1 ABOUT COMPANY

UNNATI INFORMATICS LLP is an IT-based company in Ahmedabad.

It has envisaged providing solutions to every IT-related problem in the most cost-friendly way. With this noble vision, it has expanded globally giving innumerable IT solutions to our widely existing and growing client and customer base in India, Australia, USA, UAE, Nigeria, and Ghana.

It provides services for Software development, Web-Portal development, Website Designing, E-commerce development, SEO, Customized App Development, Data Management Software with cloud hosting facility, etc.

UNNATI INFORMATICS is receptive to new ideas and promises help and support anytime and anywhere.

1.2 DIFFERENT PRODUCT/ SCOPE OF WORK

It provides work in many fields like Biometric Authentication Systems, Digital Marketing, Project Training, Learning Management Systems, School Management Systems, Online Learning For Schools, eCommerce application, Business Development Models etc.

The Famous Products that company had made are Rangoli School, Sagarcon, Script Wallah, Shreeved School, World of 32, Lodgix, Galaxy School DIU, Devasya International School (Vastral, Nikol), Nisarg Glass, Aadhar shila Trading, Location Wizard, CYCLOP etc

Vision & Mission: To provide such software solutions that are functional, reliable, maintainable and cost-friendly to our existing and growing client and customer base. To consistently cater to their growing needs for an optimal solution, ensuring excellent support and service platform to give a hassle-free experience in achieving their dreams.

1.3 SERVICES

Unnati informatics LLP provides services in following field like Software Development, Digital Marketing, Web Development, Graphic Design Work, Website Creation, App Development etc

Achievement of Company

- 16+ Successful Years in Industry
- 5000+ Happy Clients
- 6500 Completed Projects
- 30 Certified Developers

1.4 CAPACITY OF PLANT

It has a capacity of approx 30+ employee

OVERVIEW OF DEPARTMENT

2.1 TECHNICAL SPECIFICATIONS OF EQUIPMENT.

Backend

- Java
- Node Js
- Django
- .Net

Frontend

- Angular
- React

Database

- Microsoft SQL Server
- PostgreSQL
- MySQL
- mongoDB
- Oracle

Clouds & DevOps

- AWS
- GoogleCloud
- Docker
- Jenkins
- Azure

Mobile

- IOS
- Android
- React Native
- Flutter

2.2 THE SEQUENCE OF OPERATION FOR MANUFACTURING OF END PRODUCT.

The production is carried out in following steps

1. Planning
2. Analysis
3. Design
4. Implementation
5. Testing and Integration
6. Maintenance

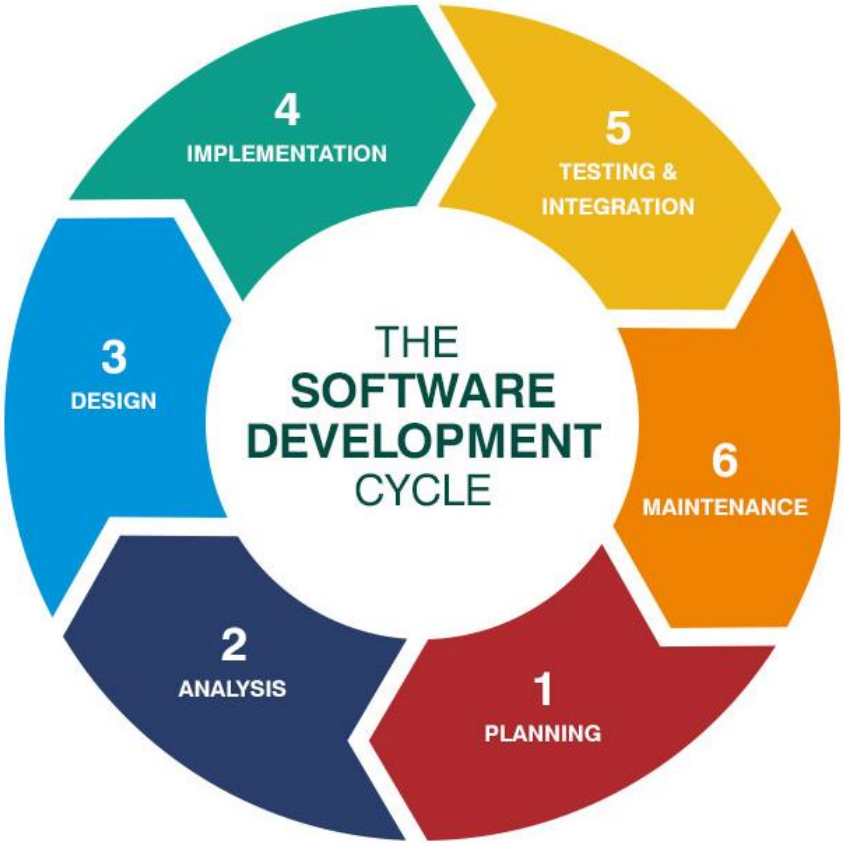


Figure 2.2.1 SDLC

2.3 EACH STAGE OF PRODUCTION.

1) Requirement Gathering and Analysis

We collected all the information regarding the project. Once requirement gathering is done, an analysis is done to check the feasibility of the development of a product. Once the requirement is clearly understood, the SRS (Software Requirement Specification) document is created. This document should be thoroughly understood by the developers and also be reviewed by the customer.

2) Design

In this phase, the requirement gathered in the SRS document is used as input and software architecture that is used for implementing system development is derived. We have design all the public pages like homepage, add expense, add income page, category chart expense, login page, signup page etc through Spring Boot, JSP, JavaScript and Bootstrap.

3) Implementing or Coding

Implementation/Coding started according to the requirement. The Software design is translated into source code. All the components of the software are implemented in this phase.
Spring Boot is used for implementation. We used MVC Structure to for implementation.

4) Testing

Testing starts once the coding is complete and the modules are released for testing. In this phase, the developed software is tested thoroughly and any defects found are assigned back to get them fixed. Testers refer SRS document to make sure that the software is as per the customer's standard.

5) Deployment

Once the product is tested, it is deployed in the production environment or first UAT (User Acceptance testing) is done depending on the customer expectation.

6) Maintenance

After the deployment of a product on the production environment, maintenance of the product i.e., if any issue comes up and needs to be fixed or any enhancement is to be done is taken care by the developers.

INTRODUCTION TO PROJECT

3.1 PROJECT SUMMARY

Expense Manager is a web-based application that aims to simplify the process of tracking and managing expenses for individuals. The application provides a user-friendly interface that allows users to add, edit, and delete expenses, set budgets, view reports, and receive alerts when expenses exceed a certain threshold.

The project was developed using Java Spring Boot framework, JSP, and MySQL database. The system includes different modules such as Customer and Admin. while the Admin module provides a dashboard that allows administrators to manage users, view reports, and configure the system's settings like add, edit and inactive category, subcategory, vendors.

The system's design includes various features such as user authentication and authorization, data encryption, and backup and restore capabilities. The project was implemented using Agile methodology, with a team of developers and a project manager working together to deliver a high-quality product within the given timeline and budget.

- **Customers:**

  The Customer module allows users to add their expenses, income and view reports.

- **Administration users (Administrators)**

  Admin module provides a dashboard that allows administrators to manage users, view reports, and configure the system's settings like add, edit and inactive category, sub category, vendors.

3.2 PURPOSE

This project is being developed with the primary goal is to Manage the Expenses of users and helping them to prevent them by providing limitations on their Spending Personal finance management is an important part of people’s lives. However, everyone does not have the knowledge or time to manage their finances in a proper manner. And, even if a person has time and knowledge, they do not bother with tracking their expenses as they find it tedious and time-

consuming. Now, you don't have to worry about managing your expenses, as you can get access to an expense the tracker that will help in the active management of your finances.

3.3 OBJECTIVE

The main objective of Expense Manager is to provide a software system that simplifies the process of tracking and managing expenses for individuals and businesses. This is achieved by automating expense categorization, generating customizable reports, and integrating with popular accounting software. The system aims to save time and effort while ensuring accuracy and compliance with financial regulations.

Another objective is to provide a user-friendly interface that is accessible to all users, regardless of their technical expertise. The system is designed to be easy to use and navigate, with intuitive controls and clear instructions.

Overall, the objective of Expense Manager is to provide a comprehensive and reliable solution for managing expenses that meets the needs of individuals.

3.4 SCOPE

This web-App stores all your Expenses and give you where you spent more and helps to prevent your expenses with the help limit you put in this Application. It gives you a notification when your expenses cross the limit.

3.5 TECHNOLOGY AND LITERATURE REVIEW

Literature Review/Background Study

Expense management is a crucial aspect of financial management for individuals and businesses alike. Proper management of expenses ensures that individuals and businesses are able to track their spending and stay within their budgets, which is essential for financial stability and growth. However, manual expense tracking and management can be time-consuming and error-prone, leading to inefficiencies and inaccuracies in financial reporting.

To address these challenges, software solutions have been developed to automate the process of expense management. These solutions typically offer features such as expense categorization, receipt scanning, report generation, and integration with accounting software. Some solutions also offer mobile apps for on-the-go expense tracking.

One study published in the Journal of Business and Management in 2015 evaluated the impact of expense management software on organizational efficiency and financial performance. The study found that the implementation of expense management software led to significant improvements in the efficiency of expense reporting and reimbursement processes, as well as increased visibility and control over expenses. The study also found that the use of expense management software resulted in a reduction in errors and fraud, leading to improved financial performance.

Another study published in the Journal of Accounting and Finance in 2017 evaluated the use of mobile expense management apps in small businesses. The study found that the use of mobile apps for expense management led to increased convenience and efficiency, as well as improved accuracy in expense tracking. The study also found that the use of mobile apps led to increased compliance with financial policies and regulations.

Overall, the literature suggests that expense management software solutions can have a significant impact on organizational efficiency and financial performance, particularly when combined with mobile apps for on-the-go expense tracking. These solutions can help individuals and businesses save time and reduce errors in expense reporting and reimbursement processes, leading to improved financial stability and growth.

Technology

The front end used in our project is JSP(jQuery, HTML, JavaScript, CSS) and the back end used is JAVA framework SpringBoot and Database is MySQL. We will follow the Iterative model for developing this Project and whole Project will be developed using the SDLC scenario.

JSP: - stands for JavaServer Pages. It is a technology used to create web pages dynamically by embedding Java code into HTML. JSP pages are compiled into servlets and run on a web server. JSP pages are commonly used for web applications, especially those that require interaction with a database or other back-end system. JSP provides a way to separate the presentation layer

(HTML) from the business logic (Java code), making it easier to maintain and update the application. JSP also provides a number of built-in tags and functions that simplify the creation of dynamic content, such as loops, conditionals, and database queries.

JavaScript: - supports the development of both client and server components of webbased applications. On the client side, it can be used to write programs that are executed by a web browser within the context of the web page. On the server side, it can be used to write web server programs that can be process information submitted by a web browser and then update the web browser display accordingly.

Spring Boot (JAVA Framework): - is a popular open-source Java framework used to build web applications and microservices. It is based on the Spring Framework and provides a simplified way to develop production-ready web applications by providing default configurations and conventions that help developers quickly get started with their projects.

Spring Boot includes a number of features that simplify application development, such as embedded web servers, auto-configuration, and dependency management. It also provides a wide range of extensions and plugins to integrate with other technologies, such as databases, messaging systems, and security frameworks.

Spring Boot uses annotations to configure the application, reducing the need for XML configuration files. It also provides a command-line interface that allows developers to quickly create new projects and run tests.

SQL

- SQL (Structured Query Language) is a special-purpose programming language designed for managing data held in a relational database management system (RDBMS).
- Originally based upon relational algebra and tuple relational calculus, SQL consists of a data definition language and a data manipulation language.
- The scope of SQL includes data insert, query, update and delete, schema creation and modification, and data access control. Although SQL is often described as, and to a great extent is, a declarative language (4GL), it also includes procedural elements.
- Data Definition: Defining tales and structure in the database.
- Data manipulation: Used to manipulate the data within those schema objects.

3.6 PROJECT PLANNING

Project Planning is concerned with identifying and measuring the activities, milestones and deliverables produced by the project. Project planning is undertaken and completed sometimes even before any development activity starts. Project planning consists of following essential activities:

- Scheduling manpower and other resources needed to develop the system.
- Staff organization and staffing plans.
- Risk identification, analysis, and accurate planning.
- Estimating some of the basic attributes of the project like cost, duration and efforts.

The effectiveness of the subsequent planning activities is based on the accuracy of these estimations. Project management involves planning, monitoring and control of the people, process and the events that occurs as the software evolves from a preliminary concept to an operational implementation. Cost estimation is a relative activity that is concerned with the resources required to accomplish the project plan.

3.6.1 Project Development Approach and Justification

A Software process model is a simplified abstract representation of a software process, which is presented from a particular perspective. A process model for software engineering is chosen based on the nature of the project and application, 14 the methods and tools to be used, and the controls and deliverables that are required. All software development can be characterized as a problem-solving loop which in four distinct stages is encountered:

- Requirement analysis
- Design
- Coding
- Testing
- Deployment

The project is based on MVC architecture where the application is divided into three logical constituents

- Model – Provide services such as user interface
- View – Implement business rules or logic
- Control - Provide handling and validation of data. (MySQL in this case)

3.6.2 Project Effort and Time, Cost Estimation

Effort Estimation

To estimate the effort required for completing the login module of an application, we need to consider various tasks and dependencies. These tasks include gathering requirements, analyzing them, designing the forms and objects, implementing business rules, validating and storing data, developing the framework, conducting testing and debugging, and deploying the module for user acceptance.

It's important to follow a specific sequence of work and consider dependencies to avoid delays. For example, form design should be done first and approved by the customer, followed by object design approved by the architect. Then, coding for business rules, calculations, and data validations can be done, followed by internal testing and user acceptance testing.

A wise estimator should seek support from others to understand the scope of each task accurately. By considering all these factors and dependencies, the estimator can determine the number of man-hours required to complete the login module.

Cost Estimation

The COCOMO Model is a software cost estimation model that requires information about the size of the software. There are three sizing options available: object points, function points, and lines of source code. Object points are calculated based on the counts of screens, reports, and components needed for the application. These counts are then weighted according to complexity to determine the object point count.

If component-based development or software reuse is applied, the percentage of reuse is estimated. The object point count is adjusted by multiplying it with [(100 - %reuse) / 100] to

obtain new object points (NOP). To estimate the effort required, a productivity rate (PROD) is derived by dividing the new object points by the number of person-months.

Cost required to develop project=effort*rs/month
Effort Estimation (E):
In Organic=2.4 (KLOC) 1.05 PM
In semidetached=3.0(KLOC) 1.12 PM In Embedded=3.6(KLOC) 1.20 PM

Duration Estimation (D):
In Organic=2.5(effort) 0.38 months
In semidetached = 2.5(effort) 0.35 months In Embedded = 2.5((effort) 0.32 months Person Estimation: P=E/D

Advantages of COCOMO:

- COCOMO is factual and easy to interpret.
- One can clearly understand how it works.
- Accounts for various factors that affect cost of the project.
- Works on historical data and hence is more predictable and accurate.

Disadvantages

- COCOMO model ignores requirements and all documentation.
- It ignores customer skills, cooperation, knowledge and other parameters.
- It oversimplifies the impact of safety/security aspects.
- It ignores hardware issues It ignores personnel turnover levels It is dependent on the amount of time spent in each phase.

3.6.3 Roles and Responsibilities

This phase defines the role and responsibilities of each and every member involved in developing the system. To develop this system there was only one group with two members working on the whole application. Each member was responsible for each and every part of developing the system. Each of the group members has sufficient knowledge in several programming languages.

1. **Project Manager:** Responsible for overall project planning, management, and coordination. This includes defining project goals, timelines, budgets, and allocating resources to ensure the project is completed successfully.
2. **Developer:** Responsible for writing the code that implements the system functionality. This includes developing and maintaining the backend and frontend components of the application.
3. **Administrators:** These are the individuals who will manage the system, add, Edit, or remove Categories, Sub Categories, Vendors and manage the overall functionality of the system. They will have access to all the features of the system and will be responsible for maintaining the system.
4. **Customers:** These are the end-users of the system who will use the application to manage their expenses. They will be able to create an account, track their expenses, view reports, and manage their budget.

3.7 PROJECT SCHEDULING (GANTT CHART)

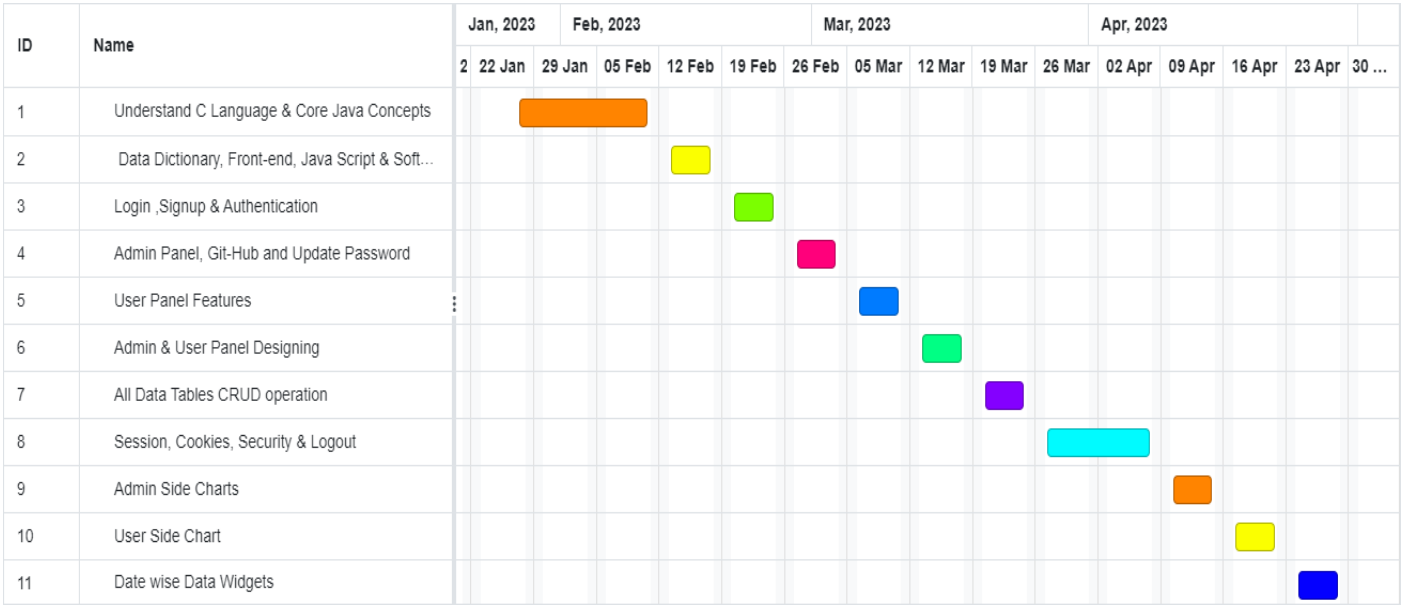


Fig 3.7.1 Gantt Chart

3.7.2 Internship Weekly Report Table

WEEKS	WORK
Week - 1	I learned core concepts, Data structures, and sorting algorithms in C and made 2 mini projects in C. I developed one Student information project to perform Store Student Data as a CRUD (Create, Read, Update, Delete) operations in the local system as a File (File Structure in C Programming).
Week - 2	I learned OOPs and core JAVA concepts using them to make one HOTEL MENU project. It displays the entire menu of one hotel and you can choose items whatever you want to eat and give a total amount of bill. Then learn some advanced concepts of JAVA like Exception Handling, String Buffer.
Week - 3	I build Hotel Coffee Menu in HTML. It enhanced my knowledge of the front-end side. I also developed one Timetable using HTML and its different TAGs.
Week - 4	Week 4 was very important because it was a time when I learned Advanced JAVA frameworks. first, we downloaded IDE for Spring Boot STS version 4.17.2 and MySQL workbench 8.0. I also learned about MVC architecture. MVC is used to keep the business logic and view login separately.
Week - 5	Update password using OTP. if OTP or email is wrong password won't change & users can Update their Password. Make Category, Subcategory, Status (Paid/Unpaid) of Expenses in Database Perform a List to show data on the JSP page in ADMIN Dashboard Perform soft Delete, which deletes data in the Website but exists in the database to know which data was actually deleted.

Week - 6	Installation of Git and Git commands to upload project code on Github.com for version control. If any vendor or category is not there in the future then deletion of that which is soft delete so that value will not be shown but will be present in the database. Also learned how to join two table's data using the join query.
Week - 7	Select data using two different tables using a join query. View Date in the view page if a user wants to see all the details of that particular data. View in detail will be only for that particular attribute by its id. Introduction to session and cookie. How to create a session and cookie.
Week - 8	Expense and Income date table on the user side using the particular id of expense and income. Signup, Login and forget password page design using CSS, Bootstrap and basic JavaScript. How to use cookies to identify each user differently and perform the task for that user only. Destroy the session on logout.
Week - 9	Admin Dashboard design and User Dashboard design. Data table feature in all the lists on the admin side and user side so that data can be sorted and easily searched. Dynamic data on Admin Dashboard according to date will change every day and every month according to user use so that admin can identify the user statistics. Dynamic data also helps users manage their expenses easily and in less time.
Week - 10	The Admin Dashboard will be enhanced with a bar chart showing monthly expenses, a line chart displaying transaction counts per month, and a donut chart indicating transaction distribution by payment type. Users will gain the ability to edit their profiles and profile images, while a filter will ensure web service access is limited to logged-in or signed-up users. Additionally, a pop-up message system will be implemented using a toaster for important notifications.

Week - 11	The Spring Boot app will be enhanced by adding a Filter Class to ensure security, restricting access to the web service for users who haven't logged in. The User Dashboard will display dynamic data specific to each user. It will include a bar chart showing monthly expenses and a pie chart indicating the status (paid or unpaid) of expenses. On the user's side, there will be a section displaying the user's most recent expenses along with their status. On the Admin side, there will be a comprehensive display of all users' expense history and details. The admin will have the ability to view each user's expense details by clicking on a view button.
Week - 12	A new feature will be implemented that allows users to update the status of their expenses and make other necessary modifications. Additionally, an expense chart will be added on both the user and admin sides, specifically focusing on categories and vendors. This chart will provide information on the number of transactions and the total amount spent on specific categories and vendors.

SYSTEM ANALYSIS

4.1 STUDY OF THE CURRENT SYSTEM

- Currently there are many systems in the market which provides services for managing expenses and incomes of users etc.
- It provides the services for adding expenses and watch all expenses added previously.
- It provides the services for adding incomes and watch all incomes added previously.

4.2 PROBLEM AND WEAKNESS OF CURRENT SYSTEM

There are no any social authentications for easy logins in the existing system. In the existing system user can only add the expenses by typing it manually, where there is no any option for the addition of image from camera or gallery which is the major disadvantage of the existing system. No any notifications will be given which is of no use in the existing system. There is no any Expense categories or vendor specific feature.

4.3 REQUIREMENTS OF THE NEW SYSTEM

In the proposed system we are going to add additional features on such as we are going to integrate image attachment from system. system for budget calculation Expenses Viewing list is enabled where user can view the expenses list which they have entered earlier. If the user spends so much of amount on a particular item then users get notification on what items they spend more and also some recommendation to reduce their expenditure.

4.4 SYSTEM FEASIBILITY

4.4.1 Does the system contribute to the overall objectives of the organization?

Our project is capable to be implemented at an organization level. And, having objectives that outline an organization's focus can help customers or users to manage & analysis their Expenses. These objectives should align with customer’s requirements. In this article, we discuss why the objectives of customers are important, how to organize these objectives, the goals of customers objectives and elements of good objectives.

4.4.2 Can the system be implemented using the current technology and within the given cost and schedule constraints.

We have implemented this project using the existing version of all the technologies used in it. We have no invested a single coin in this project. We have tried to cover all the user requirements to provide the maximum comfort to them, so we can achieve the long-term objectives with the maximum unique features. As requirements are gathered an overall version of system functions and features begins to materialize.

At project inception, software engineers ask a set of questions that establish:

- Basic understanding of problem.
- The people who want to use various services.

4.5 ACTIVITY OF NEW SYSTEM

4.5.1 Use-Case:

- In software and systems engineering, a use case is a list of steps, typically defining interactions between actor and a system, to achieve a goal.
- The actor can be a human, an external system, or time.
- In systems engineering, use cases are used at a higher level than within software engineering, often representing missions or stakeholder goals.
- The detailed requirements may then be captured in Systems Modeling Language or as contractual statements.
- As an important requirement technique, use cases have been widely used in modern software engineering over the last two decades.
- Use case driven development is a key characteristic of process models and frameworks.
- With its iterative and evolutionary nature, use case is also a good fit for agile development.

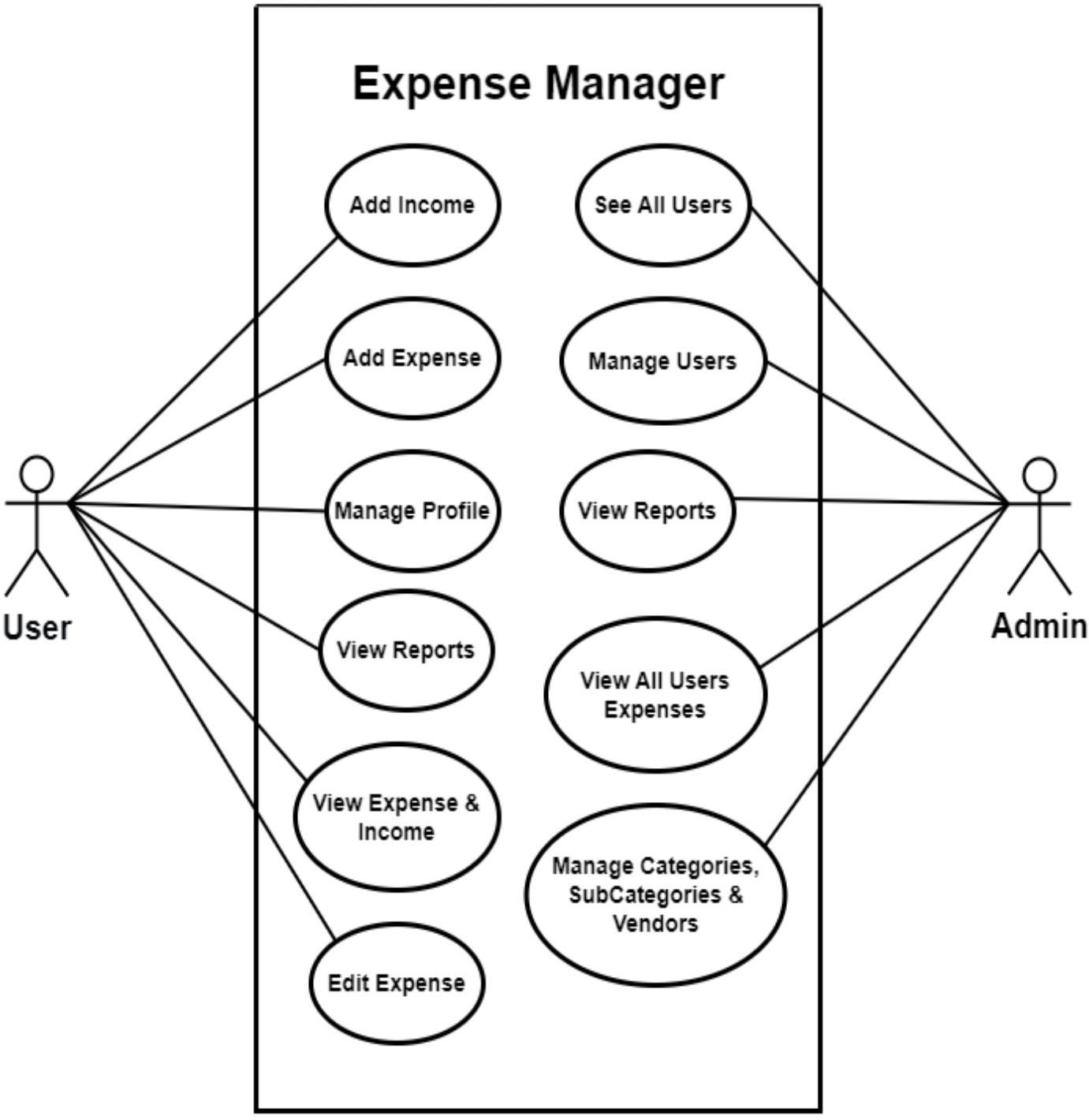


Figure 4.5.1 Use-Case System

4.5.2 Activity Diagram

Admin

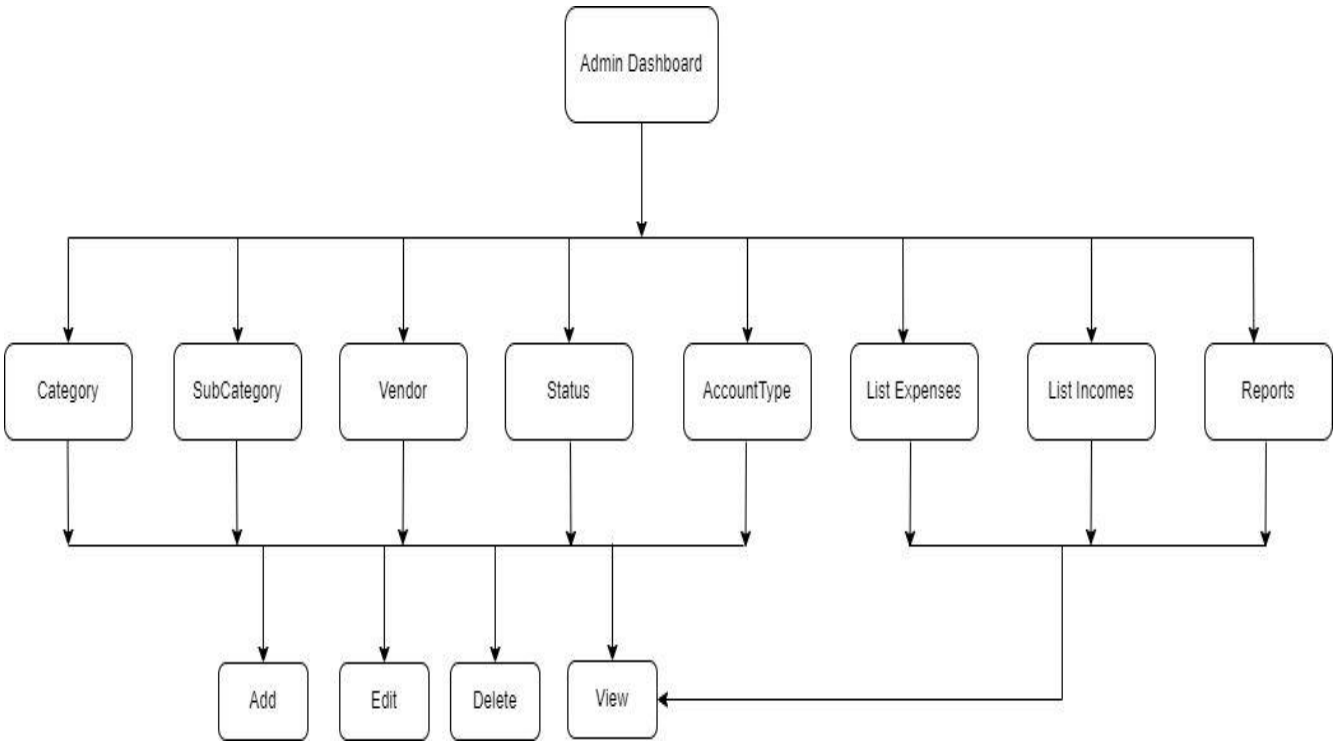


Figure 4.5.2 Activity Diagram (Admin)

User

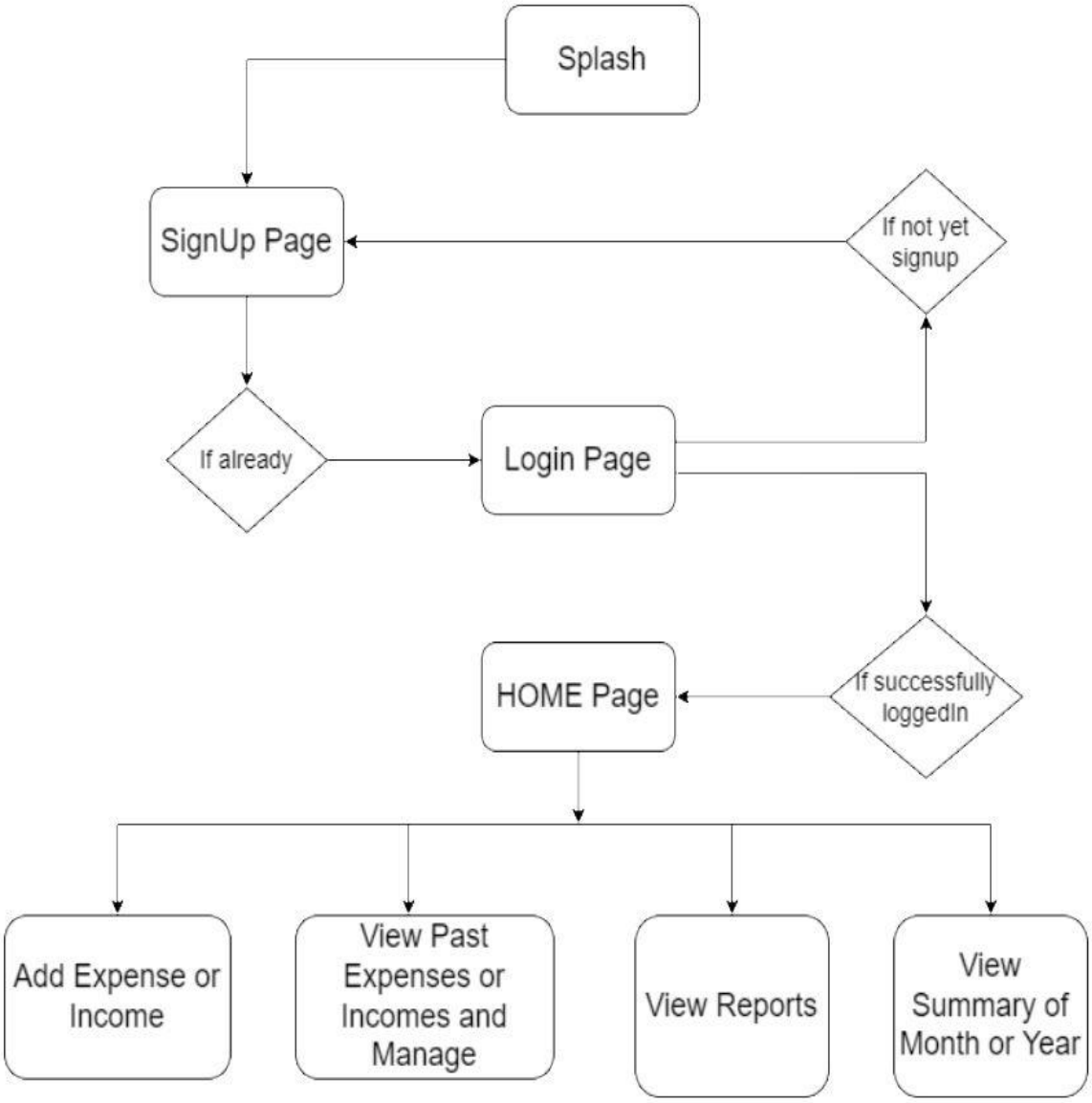


Figure 4.5.3 Activity Diagram (User)

4.5.4 Sequence Diagram

Admin

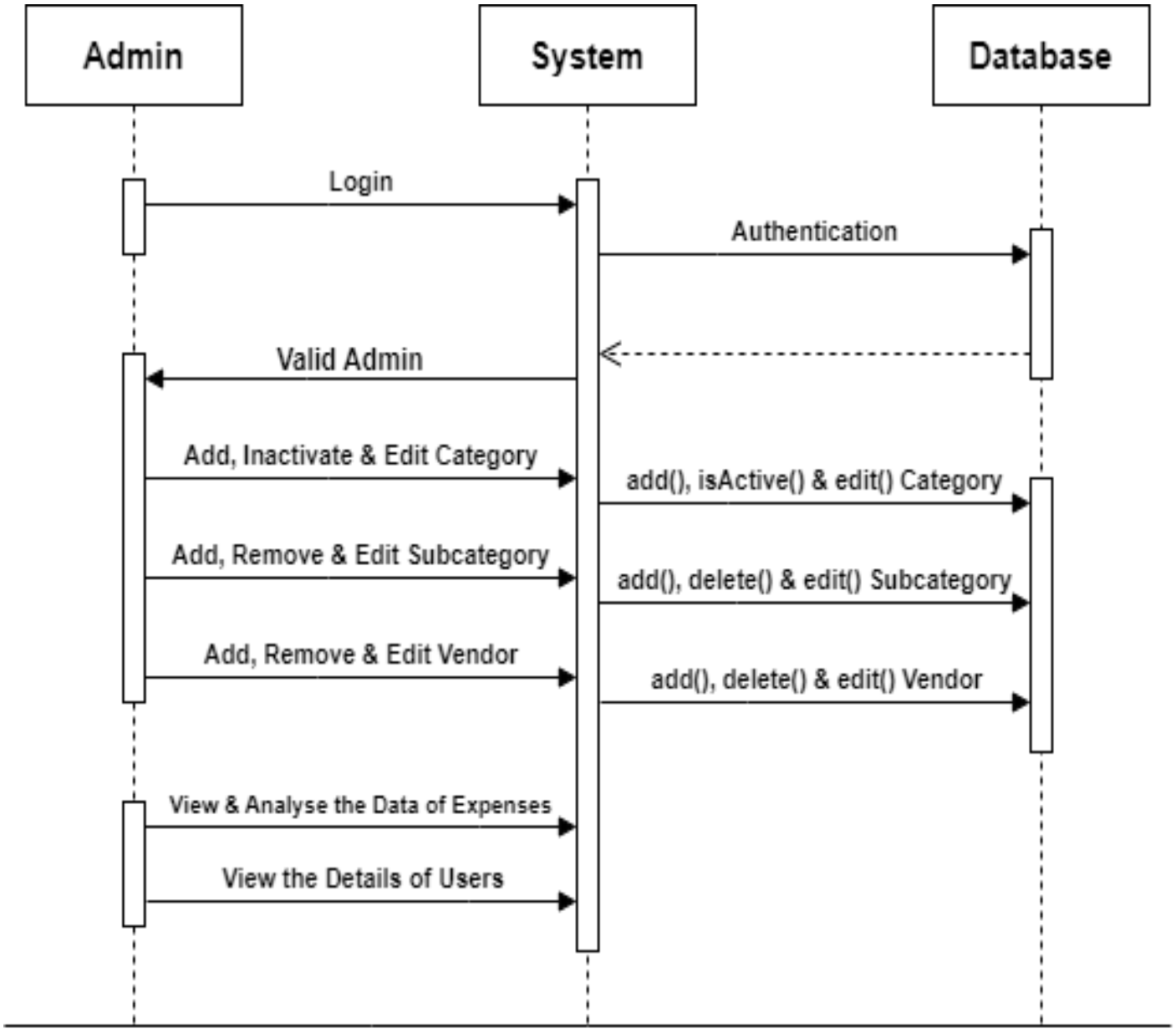


Figure 4.5.4 Sequence Diagram (Admin)

User

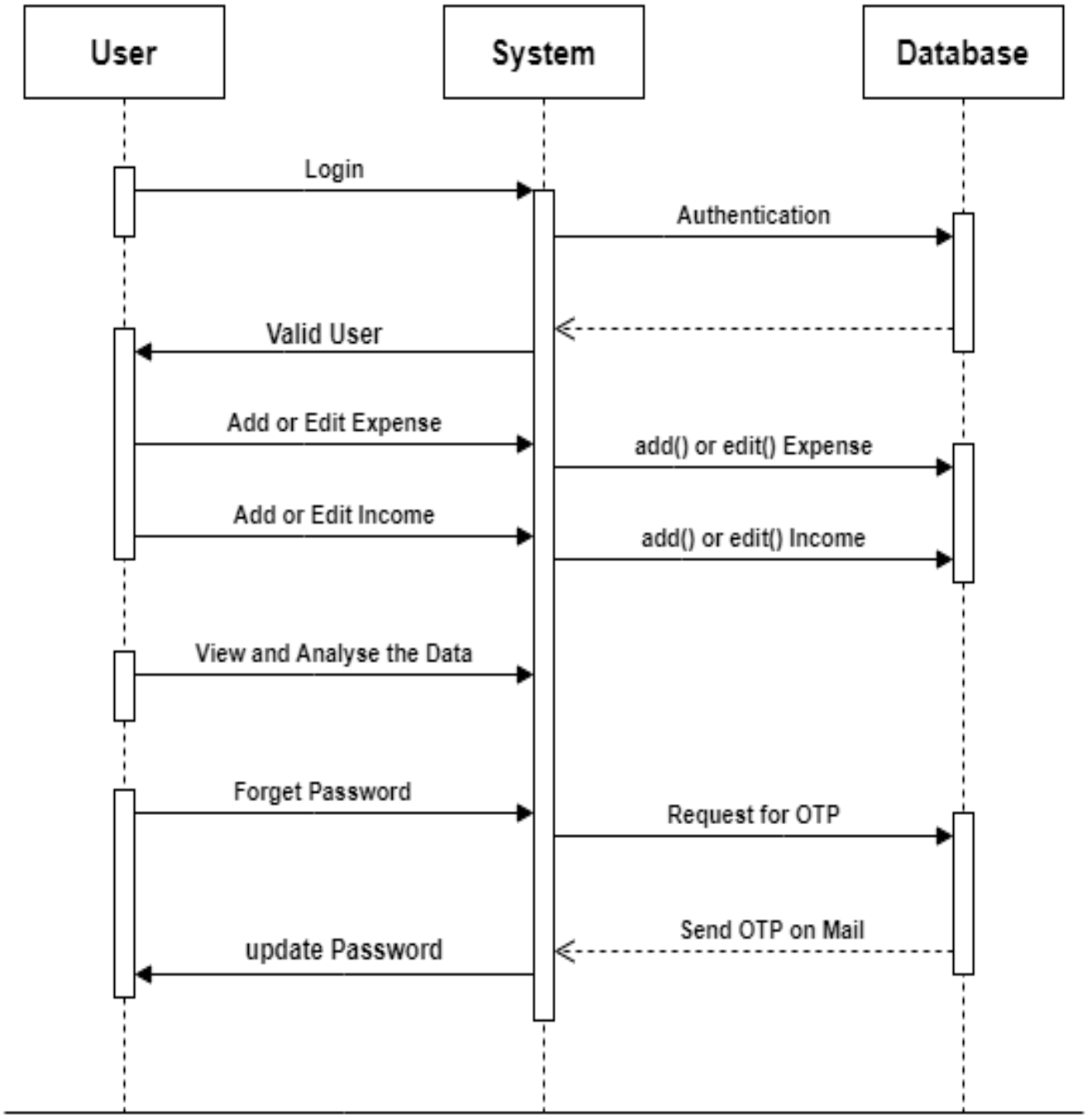


Figure 4.5.5 User Sequence Diagram (User)

4.5.6 Data Flow Diagram

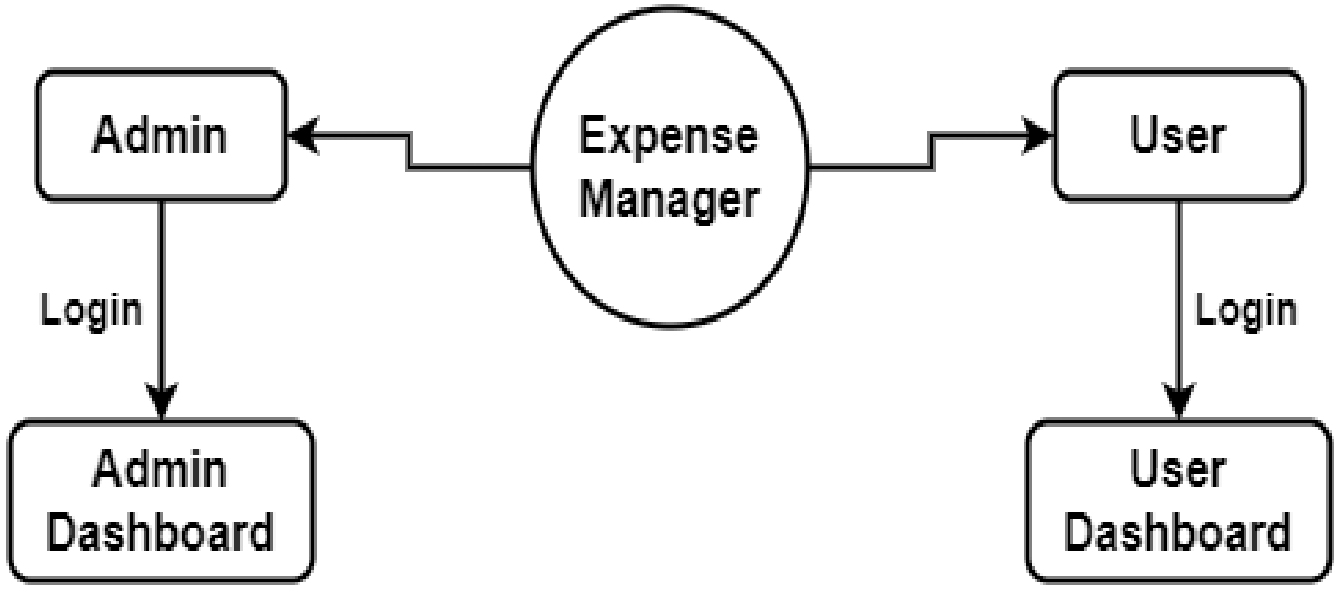


Figure 4.5.6 DFD Level 0

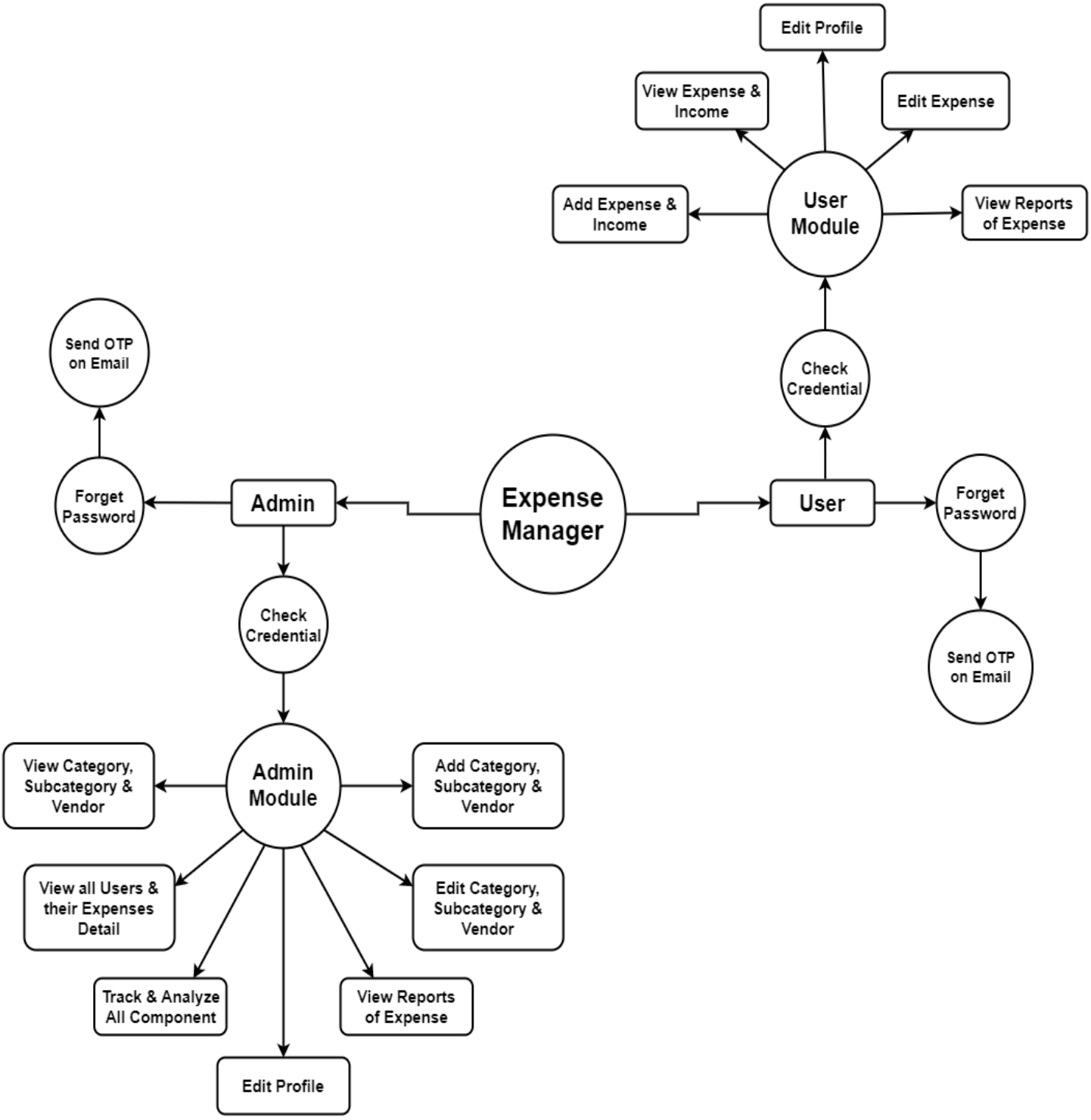


Figure 4.5.7 DFD Level 1

4.5.6 E-R Diagram

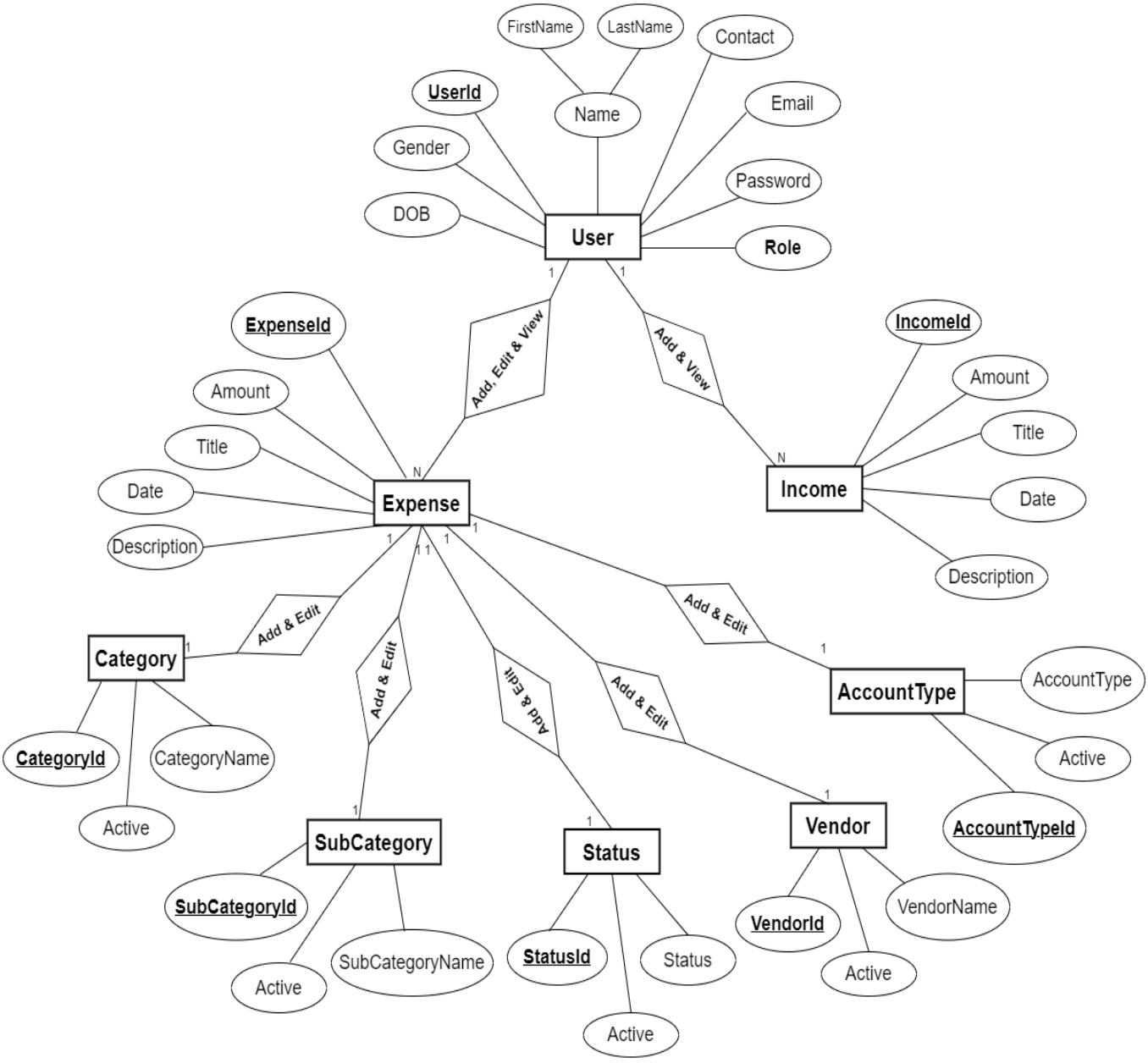


Figure 4.5.8 E-R Diagram

4.5.7 Class Diagram

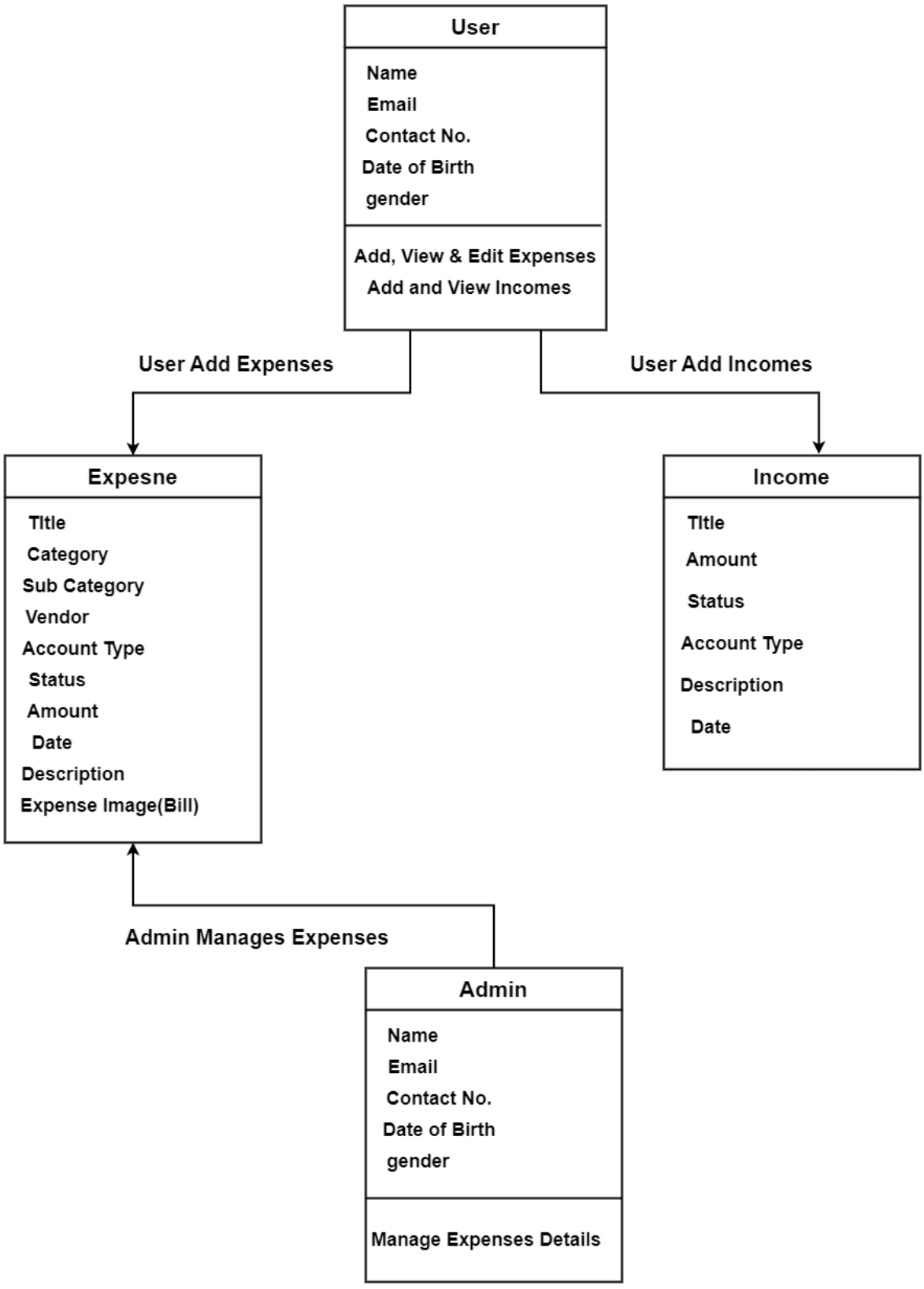


Figure 4.5.9 Class Diagram

4.6 FEATURES OF THE NEW SYSTEM

- **User-friendly interface:** The new system should have an intuitive and easy-to-use interface that allows users to manage their expenses without any difficulty.
- **Expense tracking:** The system should allow users to track their expenses, categorize them, and set budgets for different categories.
- **Receipt management:** The system should enable users to upload or scan their receipts and automatically categorize them.
- **Real-time analytics:** The system should provide real-time analytics of expenses to help users understand their spending patterns and identify trends.
- **Customizable reports:** The system should allow users to generate customizable reports and export them in various formats.
- **Multiple user accounts:** The system should support multiple user accounts, with different levels of access and permissions.
- **Security:** The system should ensure the security of user data, with encryption and secure authentication methods.

4.7 MODULES AND THEIR DESCRIPTION OF SYSTEM

4.7.1 Signup/ Login Module

Login

After SignIn or Clicking on Login link in SignIn Page should open a Login Page and allow user to log in to the system. This Login screen would be central place to allow different types of users logging in to the system i.e., Customer and Admin users. This would redirect them to respective landing page.

Signup

Customers should be able to register themselves using sign up screen. This should be a separately designed page where users would be redirected when they click on Create New Account link in Login Dialog. Customers should straightaway be able to login to the system once they create their account with Expense Manager.

4.7.2 Customer ‘s Module

Dashboard

- Account creation: The module should allow customers to create their accounts on the system by providing their personal information, such as name, email, and phone number.

- Profile management: The module should enable customers to manage their profiles, update their personal information, and change their passwords.

- Expense tracking: The module should allow customers to track their expenses, add new expenses, and categorize them.

- Budget management: The module should provide customers with a budget management feature, enabling them to set budgets for different categories and track their spending against them.

- Receipt management: The module should enable customers to upload or scan their receipts and attach them to the corresponding expenses.

- Analytics and reporting: The module should provide customers with analytics and reporting features, allowing them to view their spending patterns, generate reports, and export data.

- Payment management: The module should allow customers to manage their payments, including setting up payment methods, scheduling payments, and tracking payment history.

- Support: The module should provide customers with support features, including a knowledge base, FAQs, and a support ticket system.

- Security: The module should ensure the security of customer data, with encryption and secure authentication methods.

Setup Service

- Account setup: The service should assist users in setting up their accounts on the Expense Manager platform, guiding them through the process of entering their personal information, creating login credentials, and setting up their preferences.

- Once Security: The service should ensure the security of user data, with robust encryption methods, secure data storage, and regular security audits.

- Maintenance and updates: The service should provide regular maintenance and updates to the Expense Manager platform, ensuring it remains up-to-date with the latest security patches, feature enhancements, and bug fixes.

4.7.3 Admin Module

The admin module in the expense manager project is responsible for managing the system's overall functionality and ensuring its smooth operation. The module's primary objective is to ensure that the system's services are effectively delivered to users and that any issues that arise are resolved quickly.

User Management

- The module should allow the admin to manage the user accounts of Expense Manager, including creating new users, modifying user roles and permissions, and deactivating ordeleting user accounts.

Category and Sub Category management

- The module should enable the admin to manage the categories and subcategories for expenses and income, including creating new categories and Subcategories, modifying existing ones, and deleting categories and Subcategories that are no longer needed.

Vendor management

- The module should enable the admin to manage the Vendors for expenses including creating new Vendors, modifying existing ones, and deleting Vendors that are no longer needed.

Reporting and analytics

- The module should provide the admin with detailed reports and analytics on the expenses and income of Expense Manager, such as expense summaries, income statements, and budget variance reports.

4.8 SELECTION OF HARDWARE AND SOFTWARE CHARACTERISTICS

Hardware Requirements

- Minimum 2.27Ghz processor
- RAM: 2GB minimum Software Requirements.
- A stable network connection is essential for users to access the Expense Manager application and database. The network should have sufficient bandwidth to support concurrent user access and file transfers.

Software Requirements

- JAVA Development Kit to Compile JAVA programming language
- STS (Spring Tool Suite) or Eclipse Enterprise Edition (For live preview)
- Spring Boot Framework
- MySQL Database
- Tomcat Server

SYSTEM DESIGN

5.1 SYSTEM DESIGN & METHODOLOGY

Systems design is the process of defining the architecture, components, modules, interfaces, and data for a system to satisfy specified requirements. The System Design Description report provides summary or detailed information about a system design represented by a model. Systems design is therefore the process of defining and developing systems to satisfy specified requirements of the user.

5.2 DATABASE DESIGN

Database design is the process of producing a detailed data model of a database. This logical data model contains all the needed logical and physical design choices and physical storage parameters needed to generate a design in a Data Definition Language, which can then be used to create a database. A fully attributed data model contains detailed attributes for each entity.

Expense Manager (expenseapp) – DataDictionary

Table 5.2.1: accounttype

Table Name	accounttype			
Field Name	**Data Type**	**Length**	**Nullable**	**Comments**
accountTypeId	Int		No	Its Primary Key.
accountType	Varchar	30	No	
deleted	Tinyint	1	Yes	

Table 5.2.2: Category

Table Name	category			
Field Name	**Data Type**	**Length**	**Nullable**	**Comments**
categoryId	Int		No	Its Primary Key.
categoryName	Varchar	30	No	
deleted	Tinyint	1	Yes	

Table 5.2.3: expense

Table Name	expense			
Field Name	**Data Type**	**Length**	**Nullable**	**Comments**
expenseId	Int		No	Its Primary Key.
title	Varchar	30	Yes	
categoryId	Int		Yes	Its Foreign key of category Table
subCategoryId	Int		Yes	Its Foreign key of subcategory Table
vendorId	Int		Yes	Its Foreign key of vendor Table
accountTypeId	Int		Yes	Its Foreign key of accounttype Table
statusId	Int		Yes	Its Foreign key of status Table
ammount	Int		Yes	
date	Varchar	30	Yes	
description	Varchar	100	Yes	
userId	Int		Yes	Its Foreign key of user Table
billURL	Varchar	1024	Yes	

Table 5.2.4: income

Table Name	income			
Field Name	**Data Type**	**Length**	**Nullable**	**Comments**
incomeId	Int		No	Its Primary Key.
title	Varchar	30	Yes	
date	Varchar	30	No	
userId	Int		No	Its Foreign key of user Table
accountTypeId	Int		No	Its Foreign key of accounttype Table
description	Varchar	150	Yes	
statusId	Int		No	Its Foreign key of status Table
ammount	Int		No	

Table 5.2.5: Status

Table Name	status			
Field Name	**Data Type**	**Length**	**Nullable**	**Comments**
statusId	Int		No	Its Primary Key.
statusShow	Varchar	30	No	
deleted	Tinyint	1	Yes	

Table 5.2.6: Subcategory

Table Name	subcategory			
Field Name	**Data Type**	**Length**	**Nullable**	**Comments**
categoryId	Int		No	Its Primary Key.
categoryName	Varchar	30	No	
categoryId	Int		No	Its Foreign key of Category Table
deleted	Tinyint	1	Yes	

Table 5.2.7: User

Table Name	user			
Field Name	**Data Type**	**Length**	**Nullable**	**Comments**
userId	Int		No	Its Primary Key.
firstName	Varchar	30	No	
lastName	Varchar	30	No	
email	Varchar	50	No	
password	Varchar	80	No	
role	Int		No	
otp	Varchar	10	Yes	
gender	Varchar	6	No	
dob	Varchar	20	No	
contactNum	Varchar	20	Yes	
joinDate	Varchar	20	No	
imageURL	Varchar	1024	Yes	

Table 5.2.8: vendor

Table Name	vendor			
Field Name	**Data Type**	**Length**	**Nullable**	**Comments**
vendorId	Int		No	Its Primary Key.
vendorName	Varchar	30	No	
deleted	Tinyint	1	Yes	

5.3 SYSTEM PROCEDURAL DESIGN

5.3.1 Design Pseudo code or algorithm for method or operation

Admin Side

Step 1: Enter the URL to open the system

Step 2: Click on Login Button for Login

Step 3: Provide user name and password

Step 4: If username and password both is correct then it will login successfully.

Step 5: It shows Admin page

Step 6: Admin can able to perform Many operations and Also Access to all pages.

Step 7: Admin contain service request which include UserId status (New, pending, Completed).

User Side

Step 1: Enter the URL to open the system

Step 2: Click on Login Button for Login

Step 3: Provide user name and password

Step 4: If username and password both is correct then it will login successfully.

Step 5: It shows home page

Step 6: User can see, add and edit their Expense & Income and also able to see report and can Analyse of their expenses.

Step 7: Logout User.

5.3.2 Flow Chart

Admin

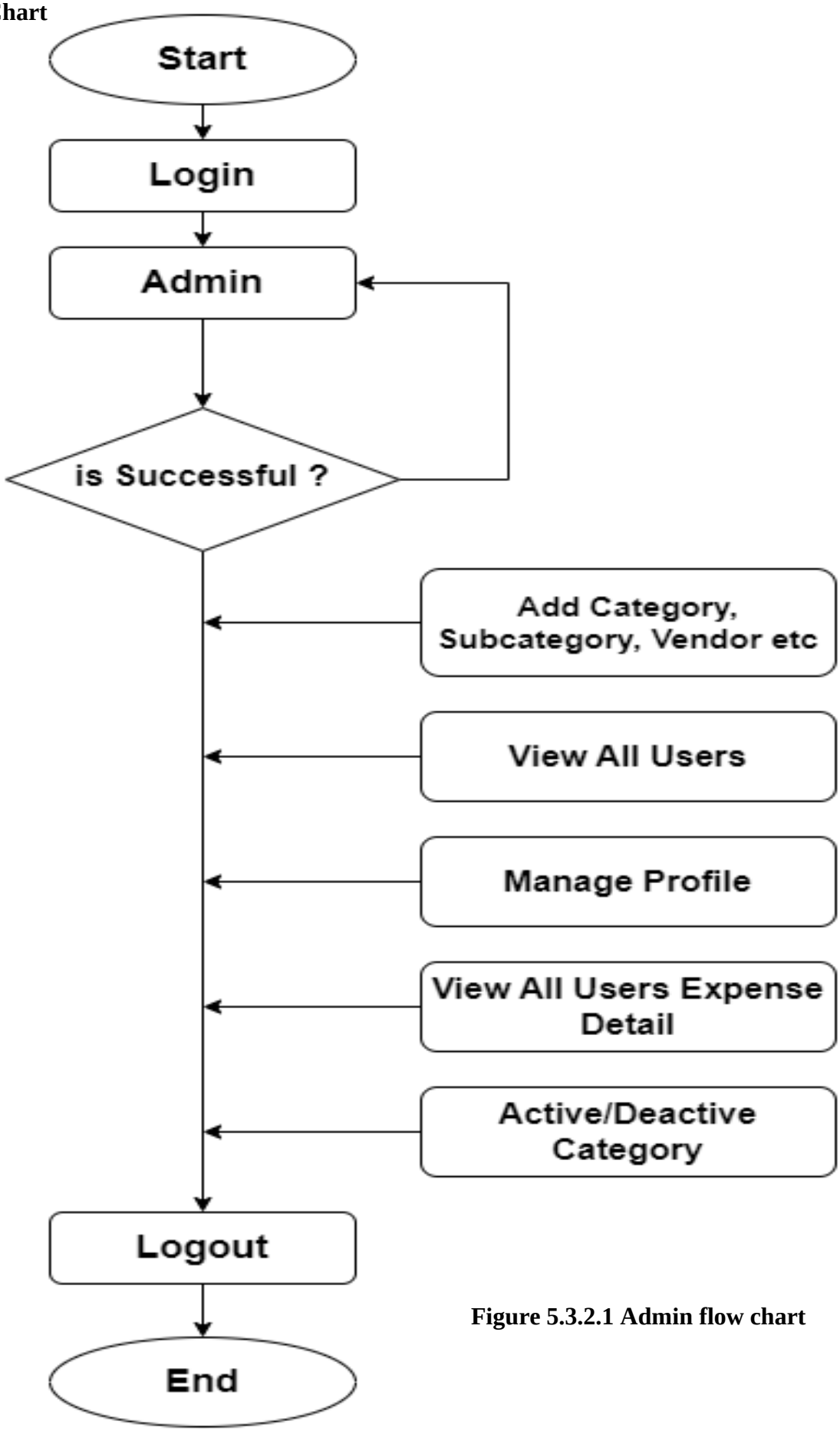


Figure 5.3.2.1 Admin flow chart

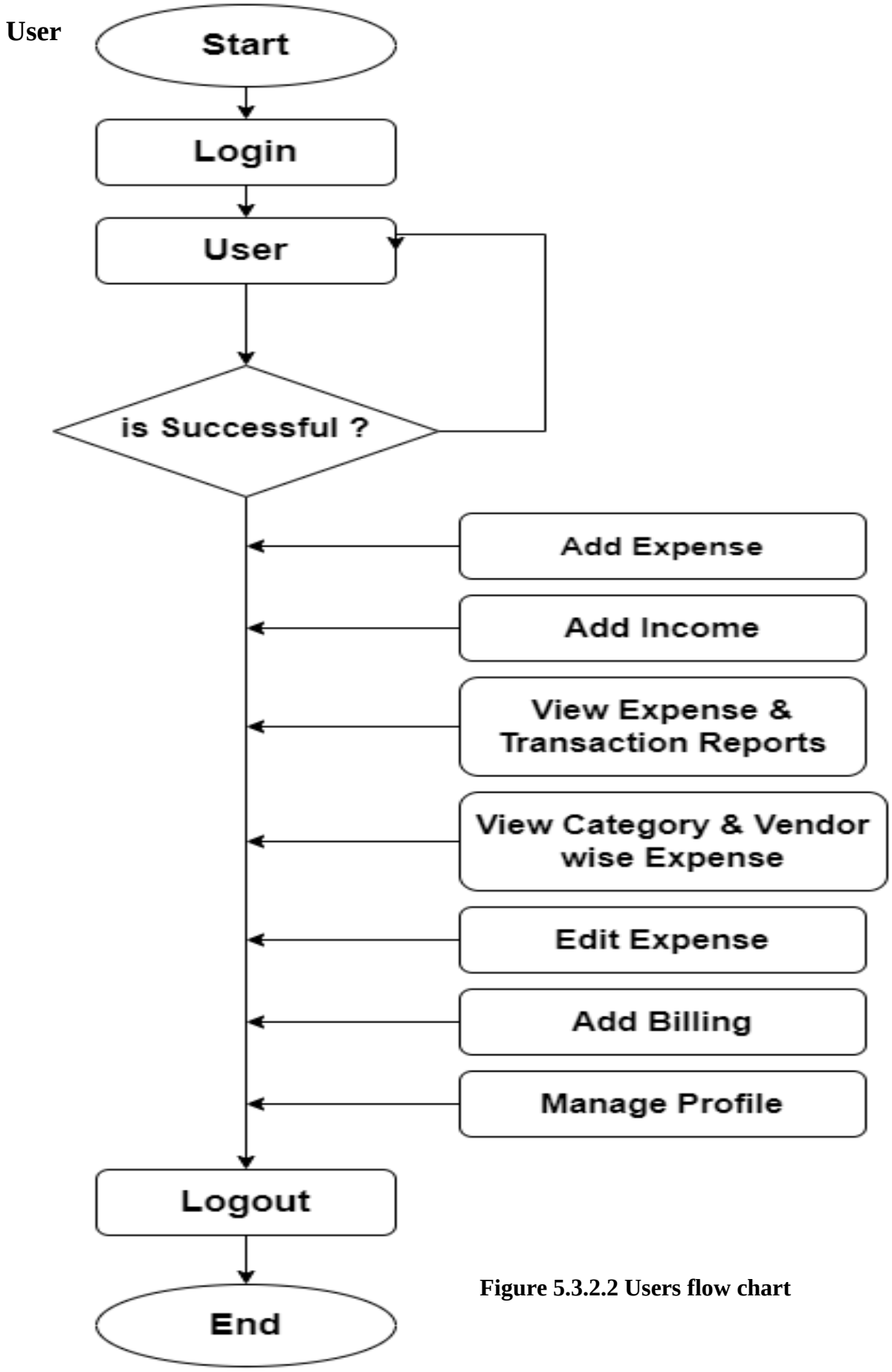


Figure 5.3.2.2 Users flow chart

5.3.3 State chart Diagram

Admin

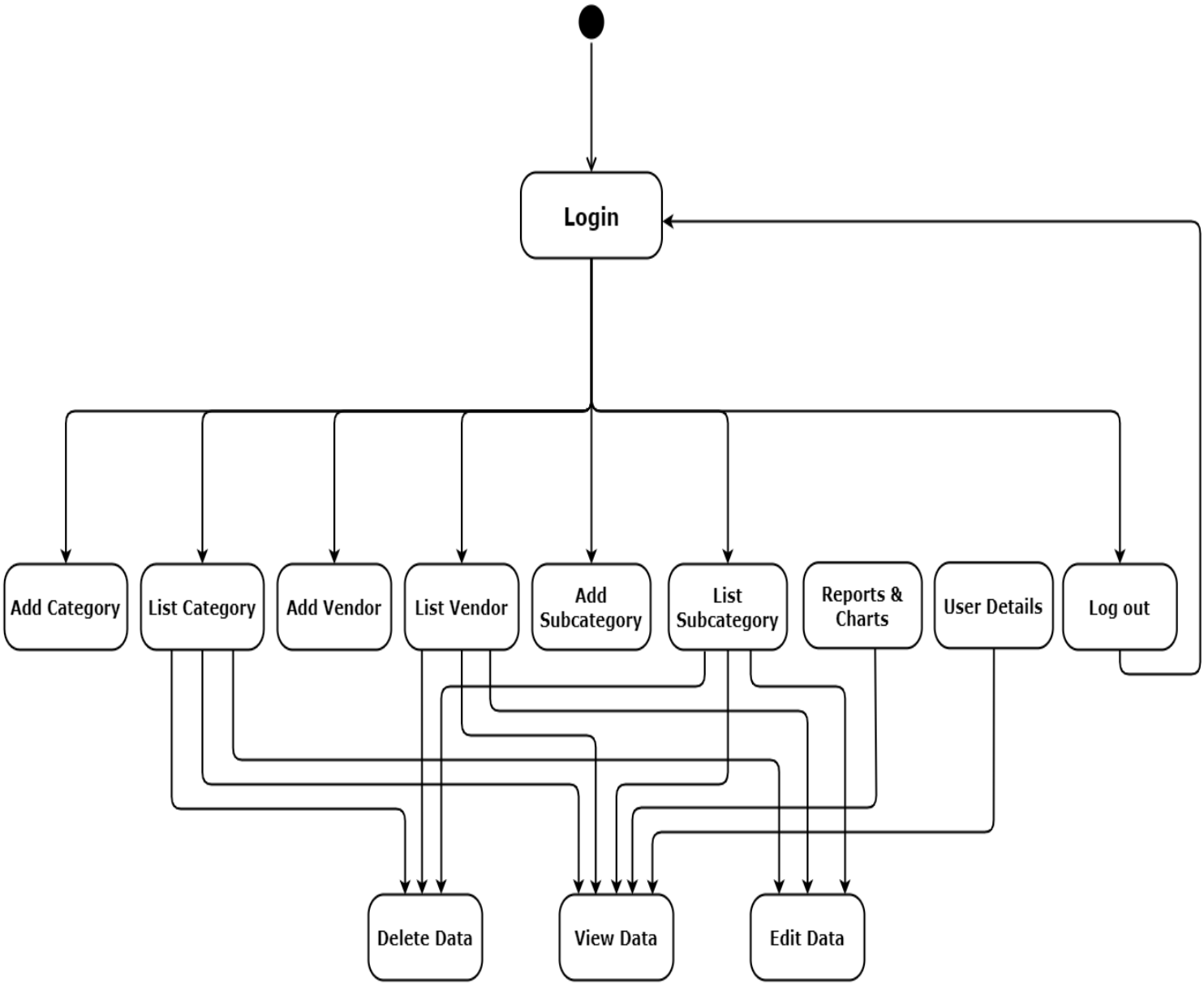


Figure 5.3.3.1 State Chart Diagram (Admin)

User

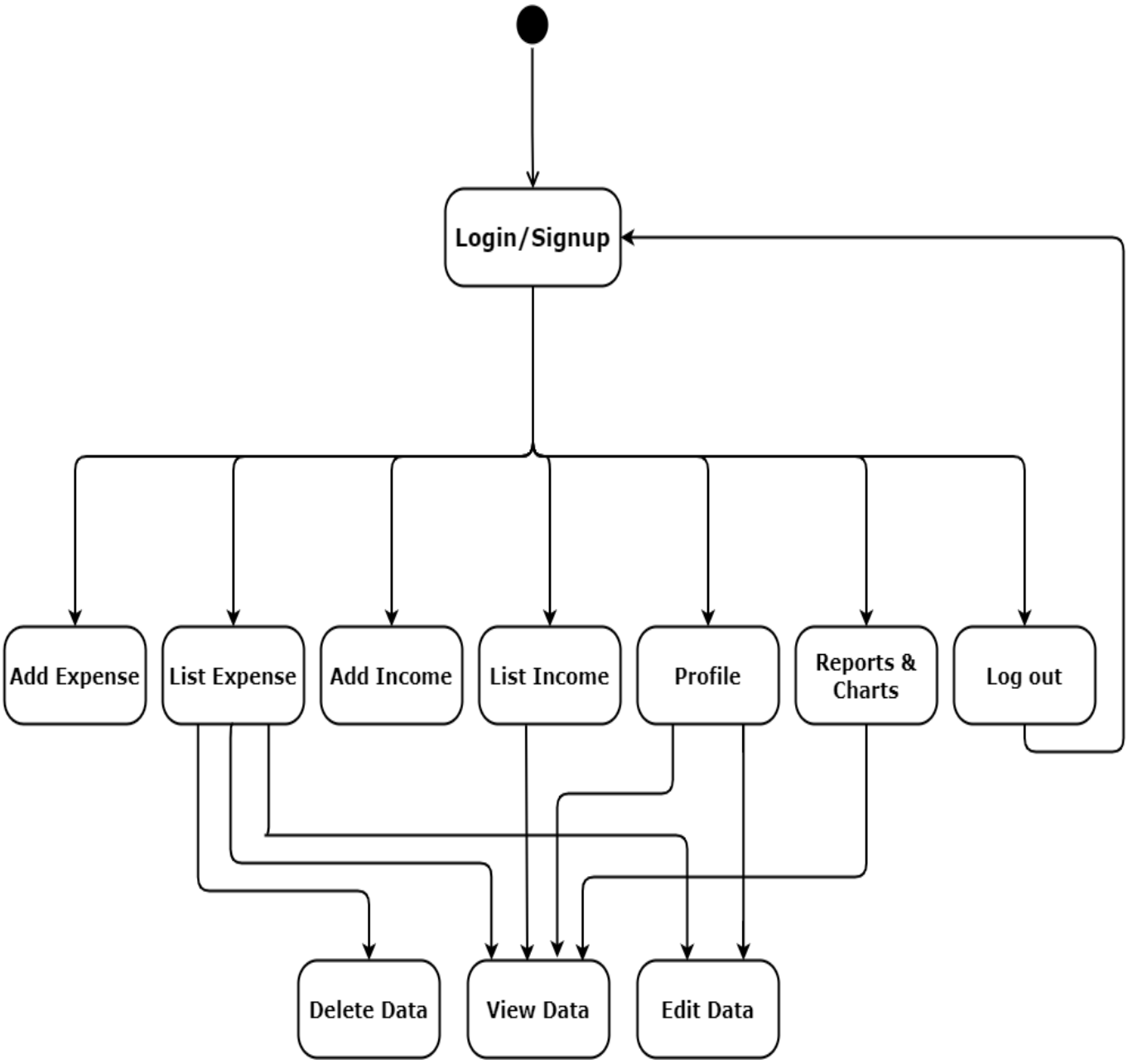


Figure 5.3.3.2 State Chart Diagram (User)

IMPLEMENTATION

6.1 IMPLEMENTATION PLATFORM

- Our project is suitable to all type of users like single and multi-users.
- Multi users are allowed to operate the website at the same time.
- We provide the interface which is user friendly.
- We have GUI (graphical user interface) by which all type of users can easily access the application.
- One user at a time and also multi users can access the website at the same time and use all the services.
- If we don't provide the GUI in the website then user won't like our website.
- For better performance and reliability, we have to include GUI in the website.
- So, for the more security and performance we have to use the GUI

6.2 TECHNOLOGY SPECIFICATION

User Authentication

- Identification and authentication are used to establish a user's identity.
- Each user is required to log in to the system.

Password Protection

- Every user who is to be allowed to access the portal is given his own username and password and given his own access rights so that only authorized and authenticated users can access the project.

Confidentiality

- We provide confidentiality to all the users.
- In that one user cannot access the data of the other users.
- For that we provide one key to each user to secure its data.

Scalability

- We provide a scalable website to make sure that every user can access the website in proper order.
- User likes those types of websites which are in one particular order that user cannot wait for the usage of the services.

6.3 RESULTS

Login

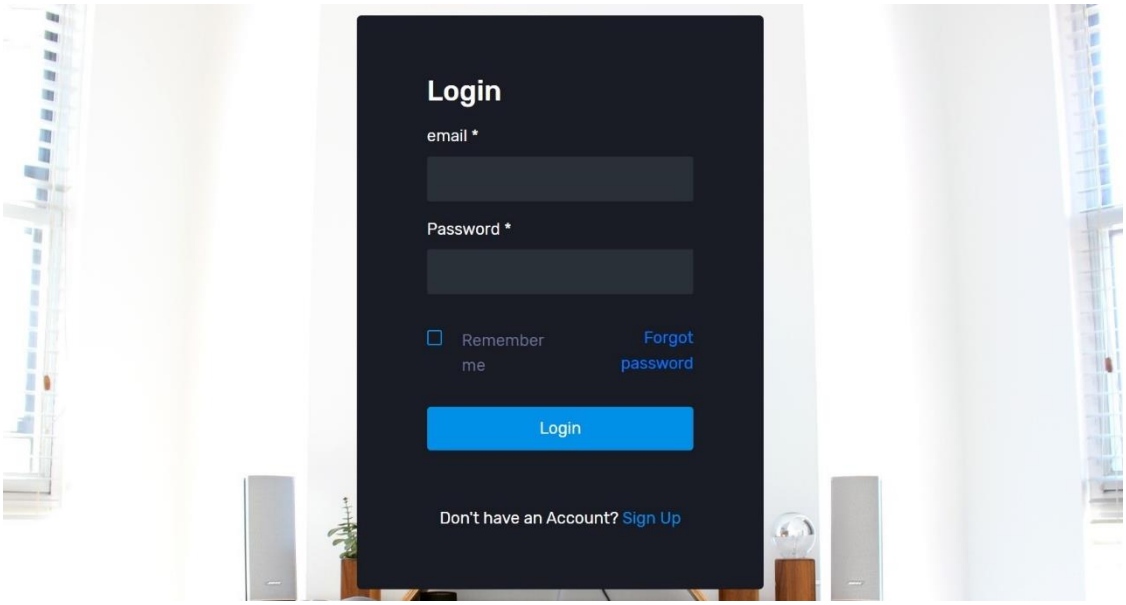


Figure 6.3.1 Login

Forgot Password

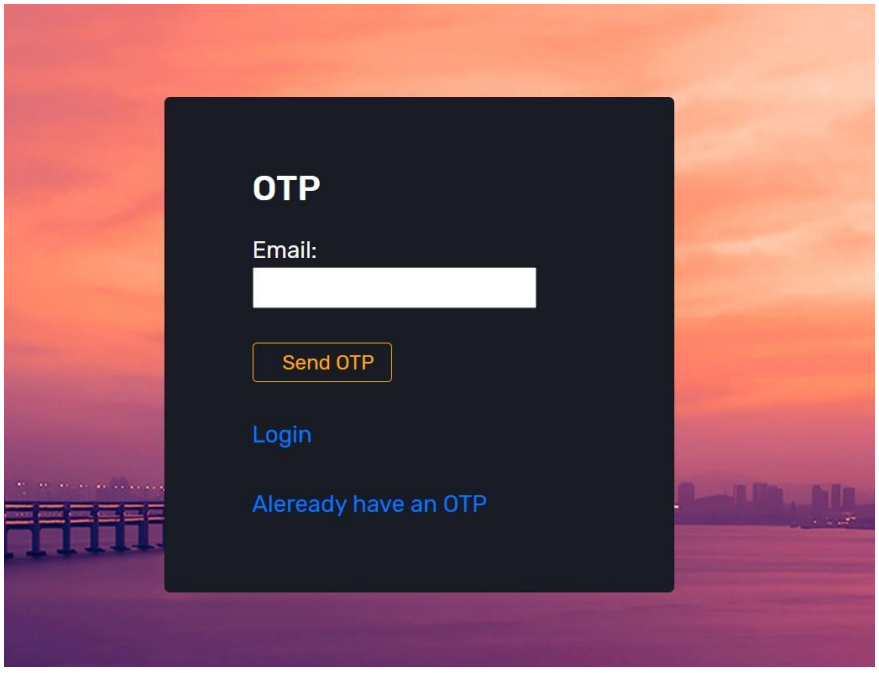
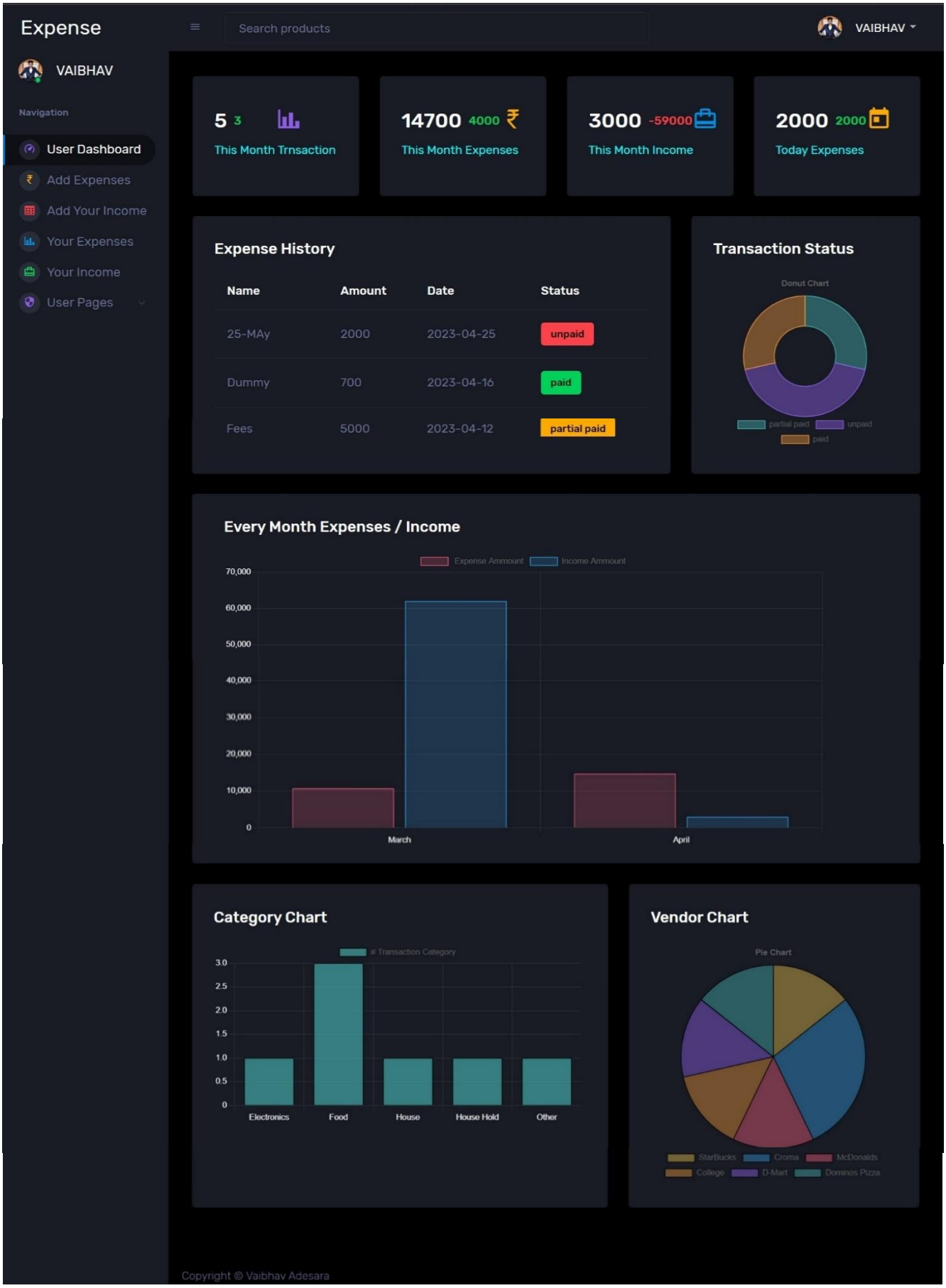


Figure 6.3.2 Forgot Password

User Dashboard (Home Page)

Figure 6.3.3 User Dashboard



User side Add Expense

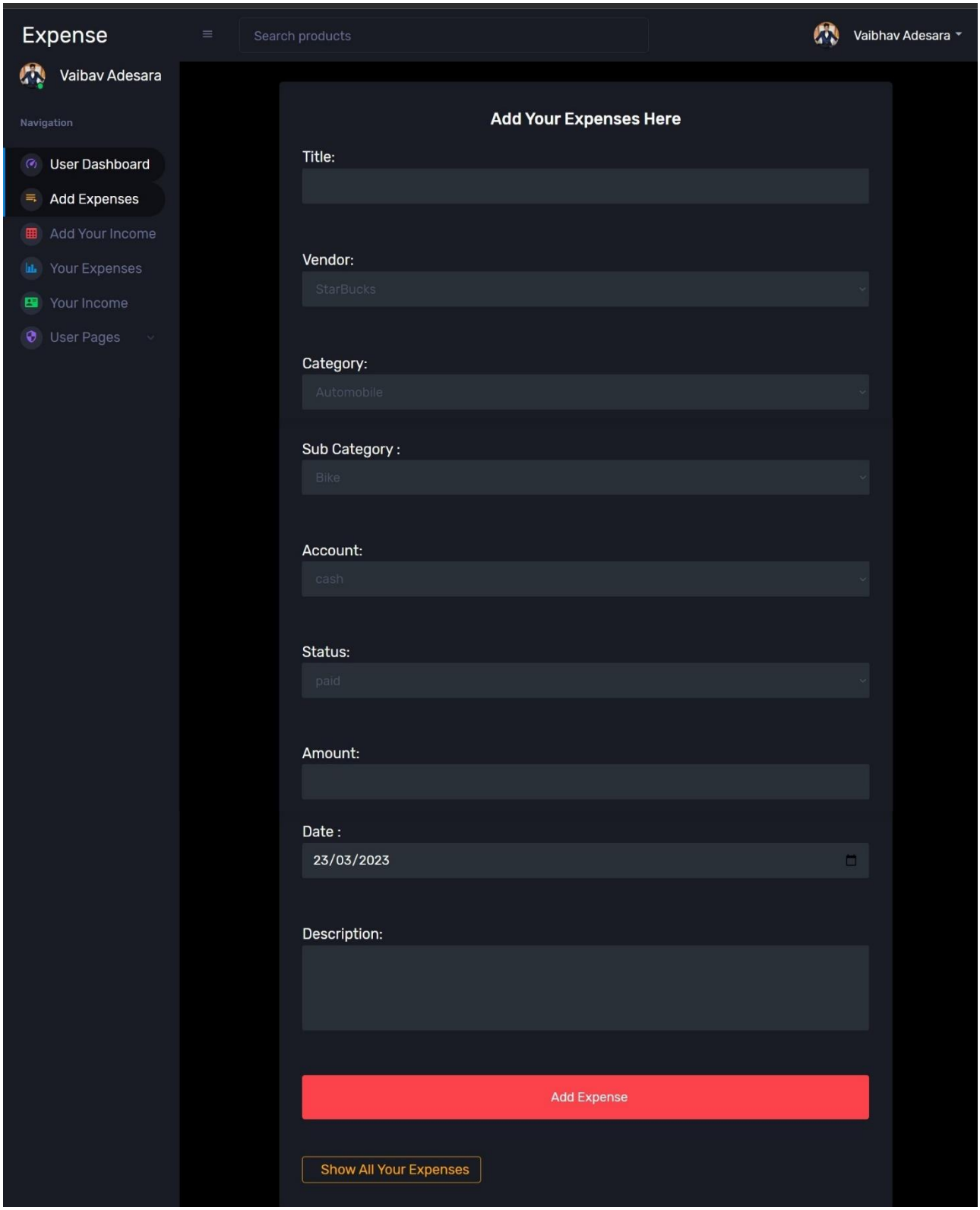


Figure 6.3.4 User side Add Expense

List Expense

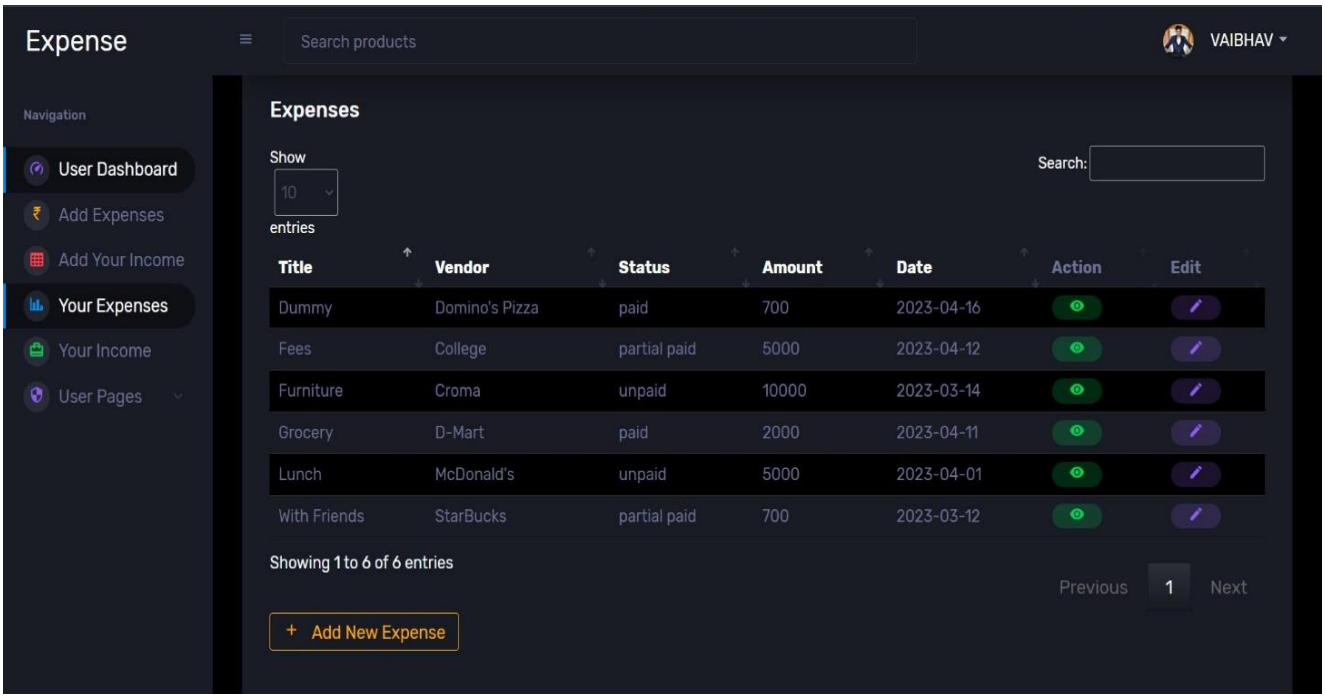


Figure 6.3.5 users Expenses List

More Expense Detail of particular Transaction

Figure 6.3.6 Particular Expense All details

Edit Users Profile

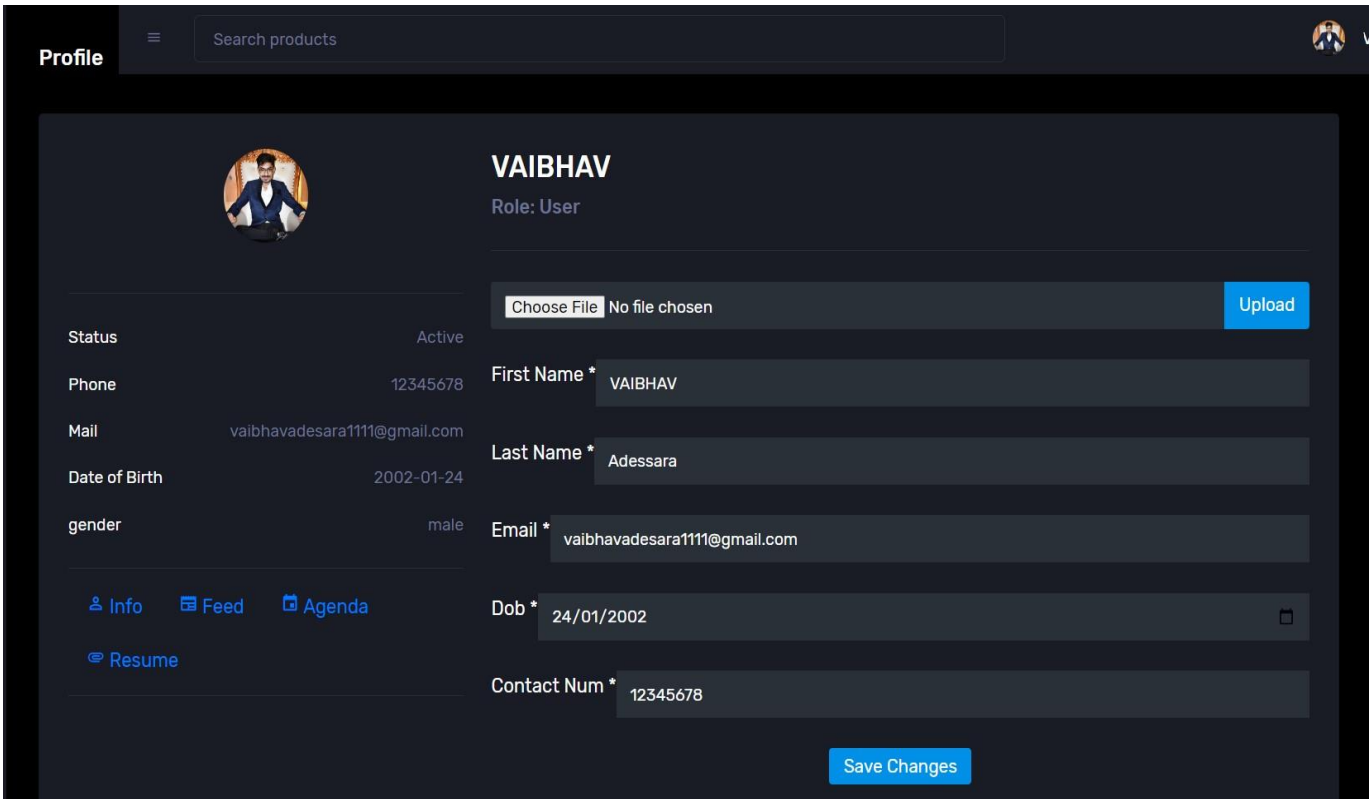


Figure 6.3.7 Edit Users Profile

Admin Dashboard

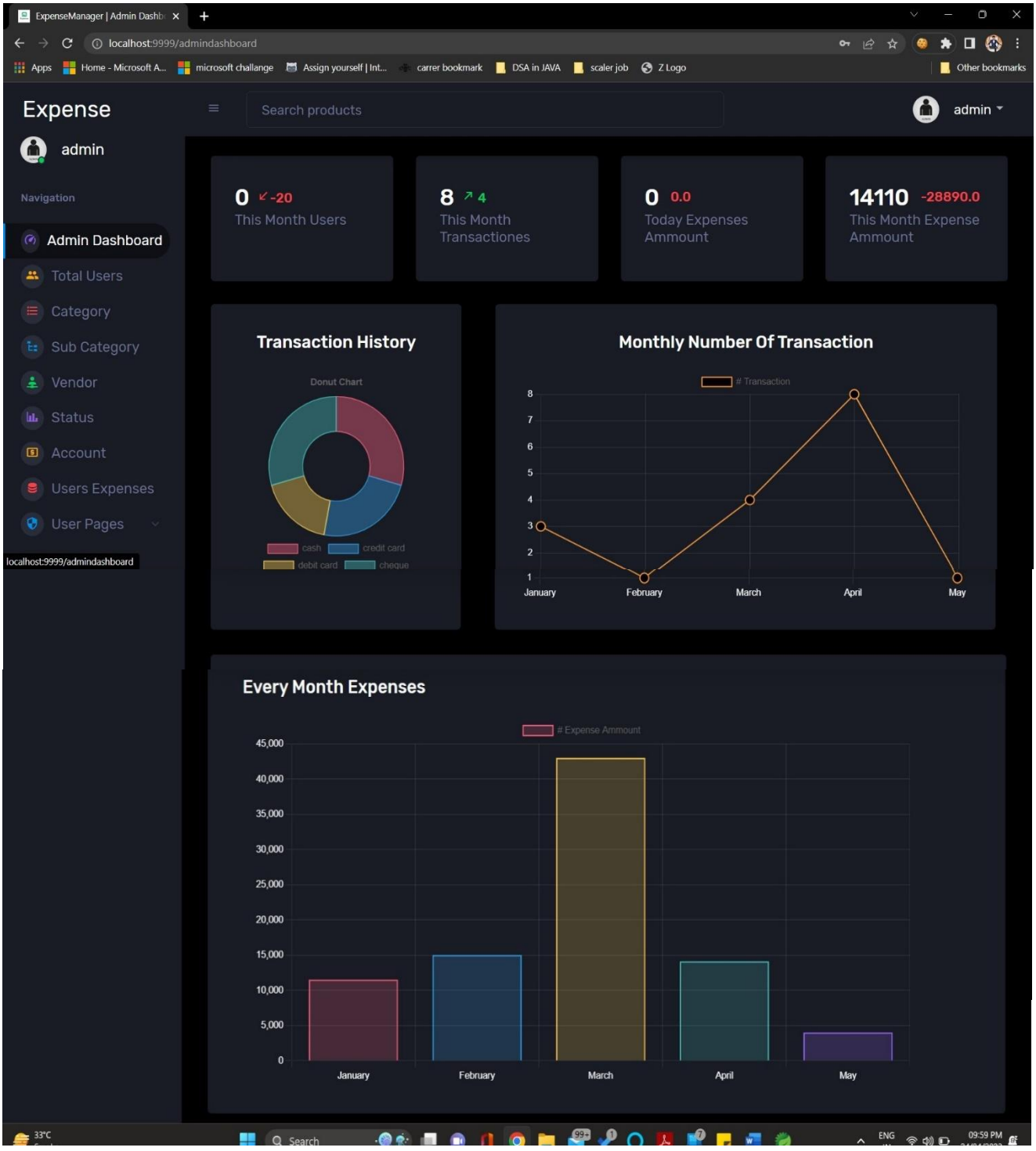


Figure 6.3.8 Admin Dashboard

List All Sub Categories

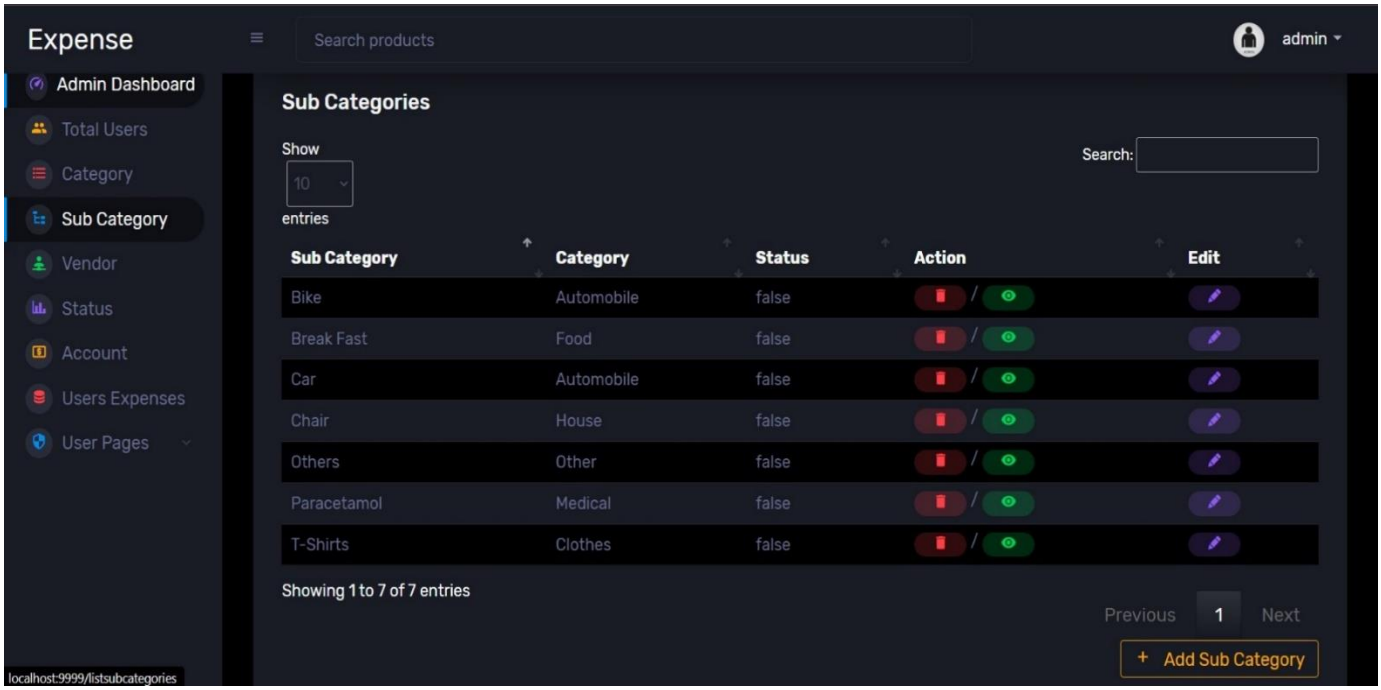


Figure 6.3.9 List All Sub Categories

Edit Sub Category

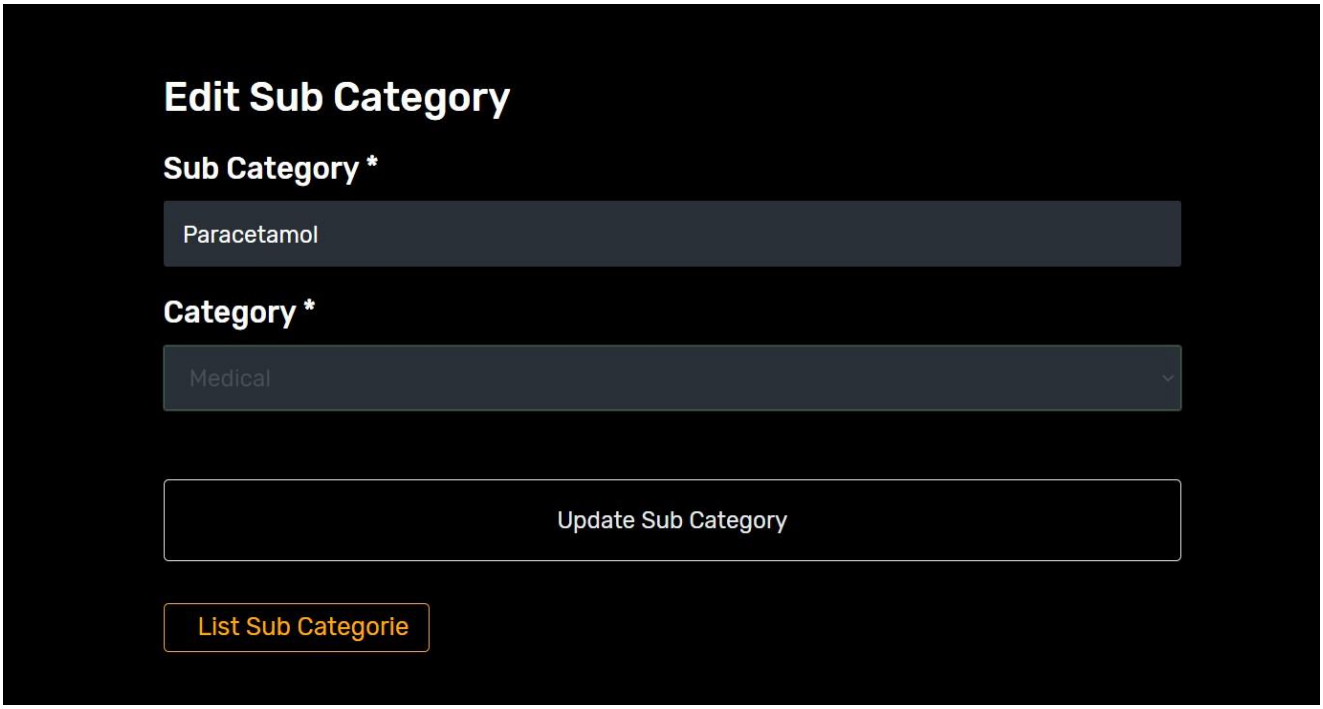


Figure 6.3.10 Edit Sub Category

TESTING

7.1 TESTING PLAN/ STRATEGY

In this project we have done the manual testing to verify that all our functionality works properly or not. The testing process is carried out when we had completed the implementation of all the functionality So here the testing had been done at the end of the internship.

In this project, we have done the functional testing that check each functionality works properly or not. All the testing procedure is carried out manually. All the testing procedure is carried out form 2nd May to 3rd May.

First of all, we create the test cases for each functionality and what should be our expected output should be note down. Then we check all the functionality and check the actual output and compare with expected output. If match then we can pass the test case else we have to gave the remarks that what changes should have to done.

7.2 TEST RESULTS AND ANALYSIS

7.2.1 Test Cases

Test ID	Test Condition	Expected Output	Actual Output	Remark
1	Customer Authentication Functionality	Login, Logout, Create Account should be done properly.	Done Properly with all the Authentication functionality.	No
2	Email Should be Sent after we submit the email to get otp for forget password	Send the Email with details like email, otp.	Perfectly Send the Email with OTP	No
3	Expense Service	User can add expense with all the proper details.	All the details should be saved properly and perfectly and expense service function work properly.	No
4	Income Service	User can add income with all the proper details.	All the details should be saved properly and perfectly and income service function work properly.	No
5	User Dashboard	User can see all expense and income history. User can edit/view/delete expense, income and edit profile.	All the User Dashboard pages are properly displayed with all the details.	No
6	Admin Screens	Admin can manage all the service and managed all the users, category, subcategory, vendor, accounttype.	Admin managed all the things properly	No

CONCLUSION AND DISCUSSION

8.1 OVERALL ANALYSIS OF INTERNSHIP

During the internship first of all they gave the basic knowledge of our languages and then they gave the project. In project first of all we have to design the webpages according they have given as per the SRS (Software Requirements Specification) then we have to design the databases for our website. After designing the database, we have to integrate all the webpages with the database and lastly, we have to do testing of our website. I uploaded my whole code in Git-Hub with timestamps and Details of every Feature which I had done during my internship.

Git-Hub link: - https://github.com/vaibhav-24hr/expenseapp_23

8.2 DATES OF SURPRISE VISIT BY INSTITUTE MENTOR

- Mentor: - Prof. Megha Joshi
- Date: - 22/April/2023

8.3 DATES OF CONTINUOUS EVALUATION (CE-I AND CE-II)

- CE-1 09/March/2023
- CE-2 05/May/2023

8.4 PROBLEM ENCOUNTERED AND POSSIBLE SOLUTIONS

A problem is that we have to enhance the distance calculation between the customer and service providers by using third-party libraries or APIs. As more efficient the calculation of distance more efficient would be assigned to the service providers properly.

8.5 SUMMARY OF INTERNSHIP

During my internship, I worked on developing an Expense Manager project. The Expense Manager is a software application that helps users track and manage their expenses efficiently. The goal of the project was to create a user-friendly interface with features for expense entry, categorization, analysis, and reporting.

Throughout the internship, I was involved in various tasks and responsibilities. Firstly, I participated in the design phase, where I contributed to creating the user interface mockups and wireframes. I focused on ensuring an intuitive and visually appealing design to enhance the user experience. Additionally, I worked on the architecture and database design, considering data storage and retrieval for efficient expense management.

Once the design was finalized, I implemented the front-end using JSP ensuring responsiveness across different devices. I integrated this with the back-end, which was developed using SpringBoot and a database management system MySQL for data storage. Throughout the development process, I followed best practices such as modular and reusable code, version control, and code documentation.

Overall, the internship provided me with hands-on experience in the complete software development life cycle, from requirements gathering to testing. It allowed me to apply my knowledge of web development, databases, and software engineering principles to develop a functional and user-friendly Expense Manager project.

8.6 CONCLUSION

In conclusion, my internship for the Expense Manager project was a valuable learning experience and an opportunity to apply my skills in developing a practical web application. Throughout the internship, I successfully developed an Expense Manager web app using the Spring Boot framework, focusing on features like expense logging, categorization, management, reporting, and budget tracking. I also prioritized user authentication, data security, and user-friendly interface design.

I gained practical experience in utilizing Spring Boot and various technologies associated with web application development. I implemented industry best practices, followed coding standards, and conducted testing to ensure the quality and functionality of the application. Moreover, I actively incorporated user feedback to improve the user experience and meet their requirements effectively.

During the internship, I also enhanced my understanding of software development lifecycle, collaboration, and project management. I learned to prioritize tasks, meet deadlines, and communicate effectively with team members and stakeholders.

Overall, the internship provided me with valuable hands-on experience in developing a real-world application, deepening my technical skills and understanding of software development principles. It also strengthened my ability to work independently, solve problems, and adapt to new technologies and frameworks.

I am grateful for the opportunity to contribute to the Expense Manager project during my internship, and I believe the skills and knowledge gained will serve as a solid foundation for my future endeavors in software development.

8.7 LIMITATION AND FUTURE ENHANCEMENT

1. In our project Mobile Compatibility: If the Expense Manager is developed as a web app, it may have limitations in terms of mobile compatibility and responsiveness. Users may face difficulties accessing and using the app on smaller screens or mobile devices.
2. Limited Expense Tracking Options: The Expense Manager might primarily focus on tracking individual expenses and may not support more complex tracking needs, such as tracking shared expenses among multiple users or tracking expenses for specific projects or events.
3. Lack of Customization: Users may have limited flexibility in customizing the Expense Manager according to their specific needs and preferences. The ability to personalize categories, reporting formats, and budgeting features could enhance the user experience.

Future Enhancements for Expense Manager:

- By Addressing above limitation, I will try to add those Features and Expense Manager can evolve into a comprehensive and versatile tool for users to effectively manage their expenses and make informed financial decisions.

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- https://mvnrepository.com/artifact/org.springframework/spring-jdbc/6.0.4
- https://mvnrepository.com/artifact/mysql/mysql-connector-java/8.0.32
- https://mvnrepository.com/artifact/com.sun.mail/javax.mail/1.6.2
- https://github.com/
- https://www.javatpoint.com/
- https://getbootstrap.com/