Mini Project Report on

Banking Management System

Submitted in partial fulfilment of the requirements of the degree of **Bachelor of Engineering** in **Information Technology**

Submitted by :

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MANJARA CHARITABLE TRUST

RAJIV GANDHI INSTITUTE OF TECHNOLOGY, MUMBAI

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DEPARTMENT OF INFORMATION TECHNOLOGY

UNIVERSITY OF MUMBAI

2025

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CERTIFICATE

Date:

This is to certify that, the project work embodied in this report entitled, *"**Bank Management System**"* submitted by "***Vaishnavi Mohite*** *bearing Roll No*. 434", "***Kumud Naik*** *bearing Roll No*. 436", "***Vrushali Sakpal*** *bearing Roll No*. 449", "***Ankita Yadav*** *bearing Roll No*. 472" for the award of ***Bachelor of Engineering (B.E.)*** degree in the subject of ***Information Technology,*** is a work carried out by them under my guidance and supervision within the institute. The work described in this project report is carried out by the concerned students and has not been submitted for the award of any other degree of the University of Mumbai.

Further, it is to certify that the students were regular during the academic year 2024-2025 and have worked under the guidance of concerned faculty until the submission of this project work at ***MCT's Rajiv Gandhi Institute of Technology, Mumbai.***

Prof. Ankush Hutke	***Prof. Rahul Jiwane***
Project Guide	***Project Co-ordinator***
Dr. Sunil B. Wankhade	***Dr. Sanjay U. Bokade***
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CERTIFICATE OF APPROVAL

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Bank Management System

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Declaration

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

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Acknowledgement

With all reverence, we take the opportunity to express our deep sense of gratitude and wholehearted indebtedness to our respected guide, **Prof. Ankush Hutke,** Department of Information Technology, Rajiv Gandhi Institute of Technology, Mumbai. From the day of conception of this project his active involvement and motivating guidance on day-to-day basis has made it possible for us to complete this challenging work in time.

We would like to express a deep sense of gratitude to our respected **Head of the Department**, **Dr. Sunil B. Wankhade** who went all the way out to help us in all genuine cases during the course of doing this project. We wish to express our sincere thanks to **Dr. Sanjay U. Bokade**, **Principa**l, Rajiv Gandhi Institute of Technology, Mumbai and would to like to acknowledge specifically for giving guidance, encouragement and inspiration throughout the academics.

We would like to thank all the staff of Information Technology Department who continuously supported and motivated during our work. Also, we would like to thank our colleagues for their continuous support and motivation during the project work. Finally, we would like to express our gratitude to our family for their eternal belief in us. We would not be where we are today without their support and encouragement.

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ABSTRACT

This project presents a user-friendly banking app designed to help user monitor and perform operations like money transaction, expense tracker, applying for loan plans. The app offers a simple and intuitive user interface, making it easy for the user to keep track of their finance and make quick transactions. By integrating an Expense tracker, user can get report of their monthly transactions which can help in making monetary decision. This app provides high security enchasing user satisfaction. Although the current version of the app focuses on basic transaction operations, future iterations may incorporate more advanced features like QR code payments, paying utility bills, booking travel and movie tickets. The project demonstrates the potential for digital solutions to encourage quick and secure transaction by making bank management more accessible, structured, and motivating for users at all levels.

CHAPTER 1
INTRODUCTION

1.1 Background

In today's rapidly evolving financial landscape, the traditional banking system faces several challenges such as manual processing, delays, and increased susceptibility to human error. With the rise of digital technologies and the widespread adoption of smartphones and the internet, there is a growing demand for more efficient, secure, and user-friendly banking solutions. The emergence of digital banking has paved the way for a transformation in how financial transactions are conducted. Customers now expect real-time access to their accounts, seamless money transfers, and comprehensive tools for financial management—all delivered through intuitive digital platforms. This shift has compelled financial institutions to modernize their systems to stay competitive, ensure customer satisfaction, and enhance operational efficiency. Against this backdrop, the Bank Management System was developed as a comprehensive solution to address the limitations of conventional banking methods. By integrating advanced technologies for secure user authentication, real-time transaction processing, and detailed expense tracking, this system aims to provide an accessible and reliable digital banking environment. It not only streamlines daily banking operations but also empowers users with the tools needed to manage their finances more effectively in an increasingly digital world.

1.2 Problem Statement

Traditional banking systems are often plagued by manual processes that lead to delays, human errors, and inefficient transaction management. These shortcomings can result in discrepancies in account balances, slow processing times, and an overall poor user experience. Furthermore, the reliance on legacy systems increases security risks and limits the ability of banks to provide real-time financial services.

The Bank Management System is proposed to address these issues by automating key banking functions, ensuring secure and efficient transaction processing, and providing users with an intuitive platform to manage their finances. This system aims to reduce operational inefficiencies, minimize the risk of errors, and enhance customer satisfaction by offering features such as secure user authentication, real-time money transfers, detailed transaction history, and integrated expense tracking.

1.3 Aim

The aim of the Bank Management System is to develop a comprehensive digital banking solution that enhances the efficiency, security, and accessibility of financial transactions. This project seeks to automate traditional banking operations, minimize manual intervention, and reduce human errors while delivering a user-friendly interface that empowers customers to manage their finances effectively.

1.4 Objectives

- Develop a Secure Registration and Authentication Module.
- Streamline Transaction Processing.
- Integrate an Expense Tracking Feature.
- Enhance User Experience Through a User-Friendly Interface.
- Ensure Data Security and Integrity.
- Facilitate Money Request and Management Services.

CHAPTER 2
LITERATURE REVIEW

Table 2.1 represents literature review that summarizes various studies on digital banking, focusing on areas like security, user experience, automation and efficiency. The literature review highlights various dimensions of digital transformation in the banking sector. It highlights how digital banking improves financial access in underserved regions. Emphasizes the importance of digital tools in bridging banking gaps. Shows increased participation in the formal financial system due to mobile banking platforms [1]. It discusses major vulnerabilities in mobile banking applications. Covers risks such as phishing, malware, and data leakage. Suggests security enhancements like two-factor authentication and end-to-end encryption [2]. It focuses on building a comprehensive bank management system using modern tools. Includes modules for account handling, transaction management, and user authentication. Reports improved processing speed and streamlined management features [3]. The proposed system presents a simple, user-friendly system for handling core banking operations. Emphasizes cost-effective system design for small-scale use. Demonstrates successful simulation and testing for essential banking tasks [4]. Designed to manage and track customer loans efficiently. Provides an interface for both customers and administrators. Enhances accuracy and reliability in handling loan records [5]. Focuses on managing cash-based loan transactions digitally. Improves transparency and reduces manual errors. Highlights data security and system reliability as key outcomes [6].

Table 2.1. Research Insights on Digital Transformation in Banking

Paper	Title	Authors	Methodology	Dataset(s)	Performance Measure
[1]	The Role of Digital Banking in Financial Inclusion	Bank of International Settlements	Analytical study on digital banking's impact on financial inclusion	Global financial inclusion reports	Increased access to banking; digital reach expansion (2023)
[2]	Security Challenges in Mobile Banking Apps	P. Gupta	Analytical review of mobile banking app vulnerabilities	Case data from security research studies	Risk identification; proposed mitigation strategies (2023)
[3]	The Design and Implementation of Bank Management System	Pavitha N., Ritesh S. Pokarne	System design and implementation study	Prototype testing and simulation data	Efficient system architecture; improved response time (2022)
[4]	Bank Management System	Pradnya Meshram, Kiran Gaware, Swati Bansod, et al.	Prototype development and performance evaluation	Functional testing logs	Cost efficiency; processing time reduction (2018)
[5]	Loan Management System	Aarti Deulkar, Nayan Tabhane, Harsh Baisware, et al.	Application development and user analysis	Loan processing datasets	Accuracy in loan tracking; simplified user workflows (2021)
[6]	Software-Based Management System for Cash Loan Transactions	Jenny Mae C. Manayon, Marlie Joie D. Parnes, et al.	Software modeling and transaction analysis	Cash loan transaction logs	Secure handling; transactional efficiency (2018)

CHAPTER 3
METHODOLOGY

3.1 Existing System

The traditional banking systems, while functional, are often outdated in terms of technology and user interaction. Table 2.2 outlines the major aspects of traditional banking system.

Table.2.2. Overview of Traditional Banking System

Aspect	Description
Manual Operations	Core banking activities such as account creation, fund transfers, and transaction updates are either fully manual or depend on outdated software. This not only delays processing but also increases the risk of human errors and inconsistencies in data.
Branch Dependency	Most services require customers to physically visit bank branches, which is time-consuming and inconvenient, especially for people in remote locations or with mobility constraints.
Limited Digital Services	If available, online banking portals are often basic, offering only a few services like viewing balances or downloading statements, with little or no interactivity or automation.
Poor User Interface	Existing digital systems tend to have cluttered and unintuitive interfaces, making navigation difficult for non-technical users.
Basic Security Mechanisms	Systems may rely solely on simple username/password authentication without additional security measures like two-factor authentication or transaction-level security (e.g., TPIN).
No Expense Tracking	Customers must rely on external applications to track their spending habits, as traditional systems do not provide built-in financial management tools.
No Peer-to-Peer Money Request Feature	There is often no provision for users to request or send money to peers within the same platform.

3.2 Proposed System

The **Bank Management System** aims to overcome the shortcomings of traditional banking through a modern, secure, and user-centric digital solution. This proposed system not only resolves the inefficiencies of the existing system but also introduces smart features to help users take better control of their finances while ensuring data security and system reliability. Here's how the proposed system enhances performance and user experience as shown in table 2.3:

Table 2.3. Overview on Proposed Digital Banking System

Aspect	Description
End-to-End Automation	All core functionalities—account creation, login, money transfer, balance updates, and transaction tracking—are fully automated, improving processing speed and reducing human error.
24/7 Remote Access	Being a web-based system, it allows customers to perform all banking operations online from any location, using a computer or mobile device.
Feature-Rich Dashboard	Users get access to a clean, interactive dashboard that displays real-time information like current balance, recent transactions, and spending summaries.
Multi-Level Security	In addition to password protection, a Transaction PIN (TPIN) is used to authorize sensitive activities like transferring funds, adding an extra layer of security.
Expense Tracker	A built-in expense tracker automatically categorizes monthly expenses, helping users manage their finances without needing external apps.
Money Request System	Users can send and receive money requests from other users, making it easy to handle personal or business transactions within the same ecosystem.
User-Centric Design	The interface is designed with simplicity in mind, allowing both tech-savvy and non-technical users to navigate the system with ease.
Fast & Accurate Transaction Handling	Transactions are processed in real time with accurate balance updates, reducing the typical delays seen in manual or semi-automated systems.

3.2.1 Flow Diagram for Server Side

Figure 3.2.a represents the sever side proposed system which is used for storing the data when the user signs in, verifying the user authenticity and performing various operations.

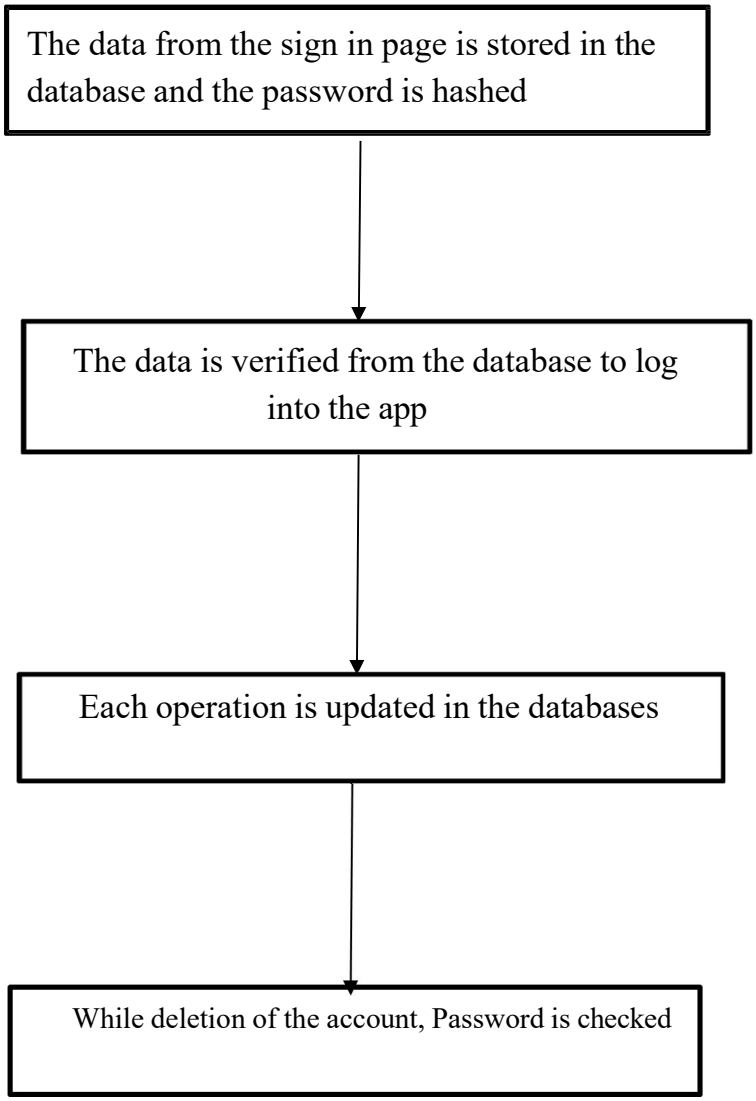

Fig.3.2.a. Flow Diagram for Server Side

3.2.2 Flow Diagram for Client Side

Fig 3.2.b represents the steps needed for the user to log in and use the application. The client-side flow initiates with user registration and login, allowing access to the homepage and core functionalities.

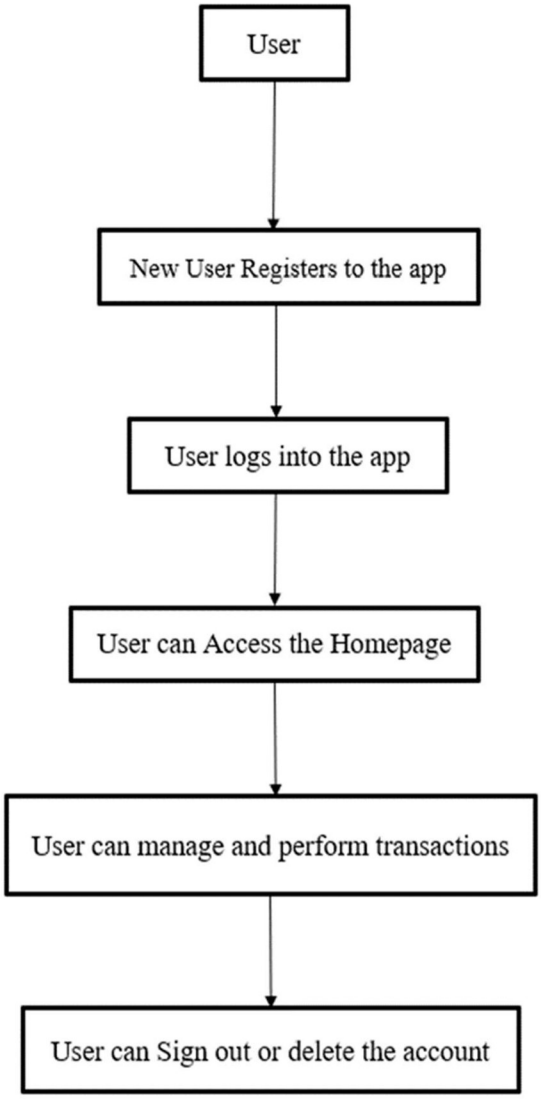

Fig.3.2.b. Flow Diagram for Client Side

3.2.3 System Flow

The fig. 3.2.c represents the flow of the whole system to use the application.

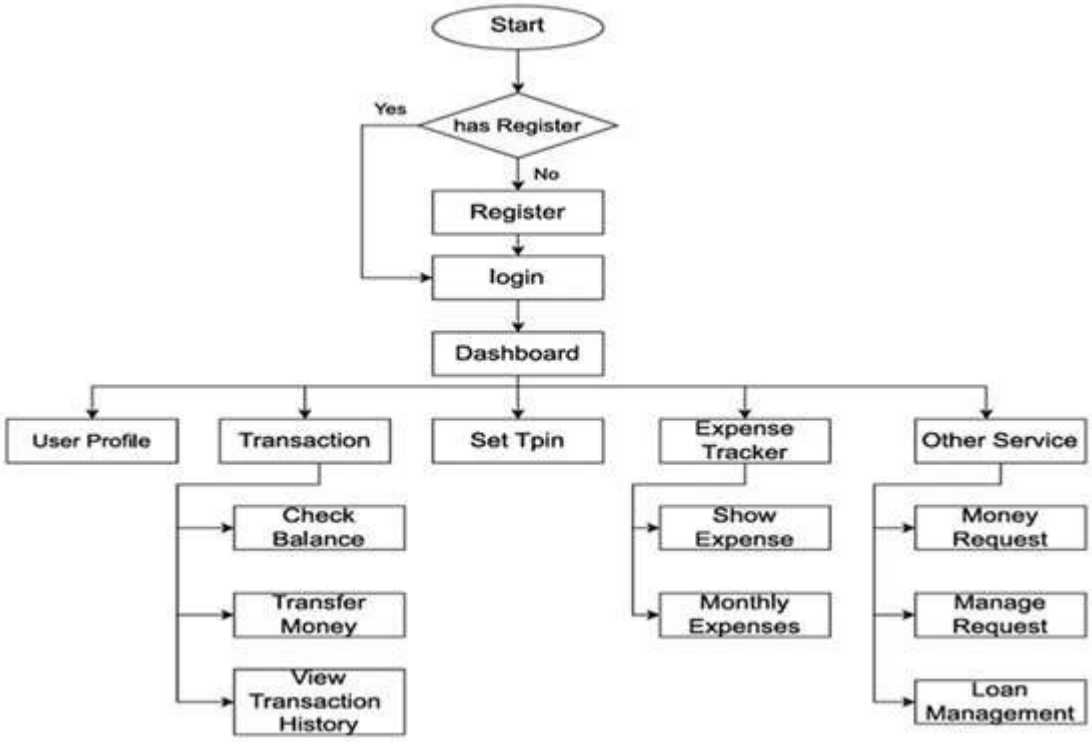

Fig.3.2.c. Flow Diagram for System Flow

3.3 Design

The fig 3.2.d represents the design needed for using the application.

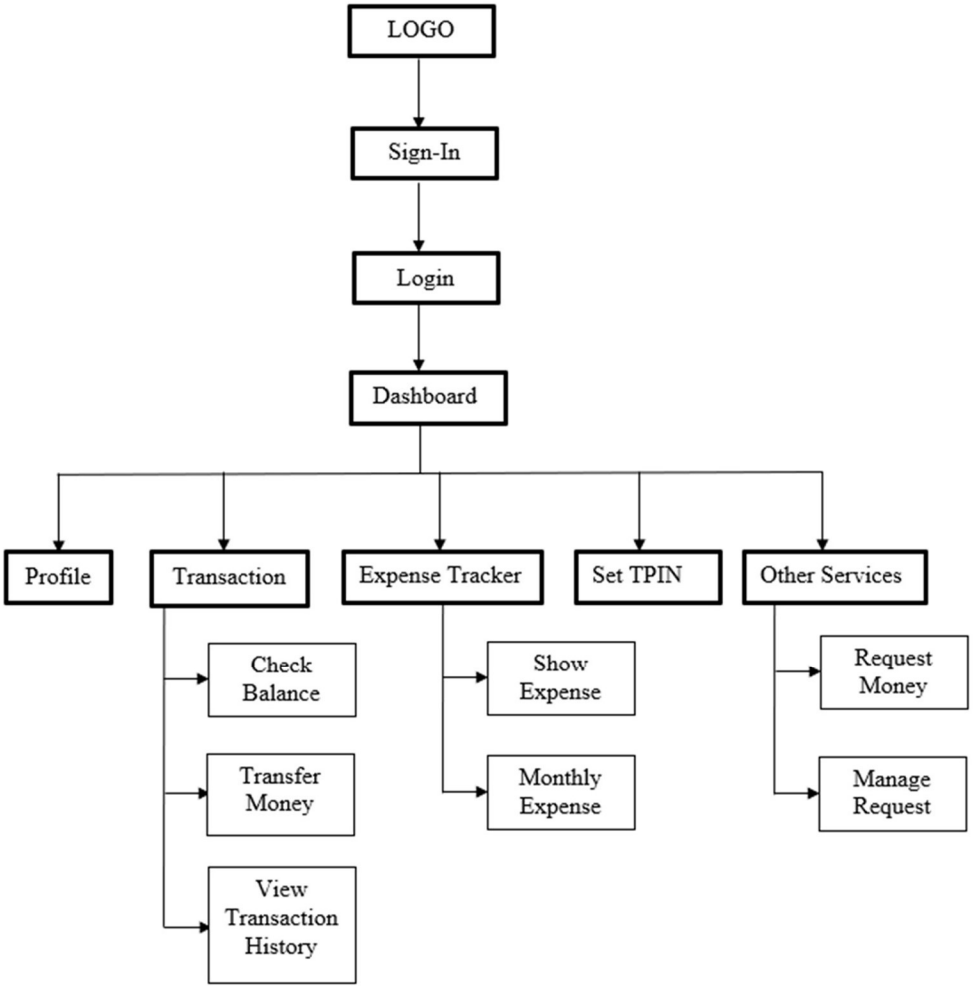

Fig.3.3. Flow Diagram for Design

3.4 Tools and Techniques

- **Software Requirement**

Table 2.4 represents the software requirements for the proposed system.

Table 2.4. Software requirements

Requirement Type	Specification
Operating System	Windows 10 or higher / Linux (Ubuntu 18.04+)
Frontend Technologies	HTML, CSS, JavaScript (React or basic web technologies)
Backend Technologies	Python (Flask / Django) or Java (Spring Boot)
Database	MySQL / PostgreSQL / SQLite
Web Server	Apache / Nginx / Flask development server
IDE/Code Editor	Visual Studio Code / PyCharm / Eclipse
Browser	Google Chrome / Mozilla Firefox

- **Hardware Requirements**

Table 2.5 represents the software requirements for the proposed system.

Table 2.5. Hardware requirements

Component	Minimum Specification	Recommended Specification
Processor	Intel Core i3 (6th Gen)	Intel Core i5/i7 or AMD Ryzen 5+
RAM	4 GB	8 GB or more
Hard Disk	250 GB HDD	256 GB SSD or higher
Display	13" or higher	Full HD (1080p) resolution
Internet	Required for remote database and testing	Stable broadband connection
Peripherals	Keyboard, Mouse	Keyboard, Mouse, External Storage (optional)

CHAPTER 4

IMPLEMENTATION AND RESULTS

A. SIGN-IN PAGE:

The fig 4.1 shows registration page which is used to sign in into the app. To register, requirements are as follows:

1) Account Number
2) Account Holder Name
3) Username
4) Email
5) Date of Birth
6) Gender
7) Pin

Fig.4.1. Sign in page

B. LOGIN PAGE:

Fig. 4.2 shows login page ensure user authentication, allowing secure access to the application. The login credentials are verified from the database, ensuring only authorized users can access their accounts.

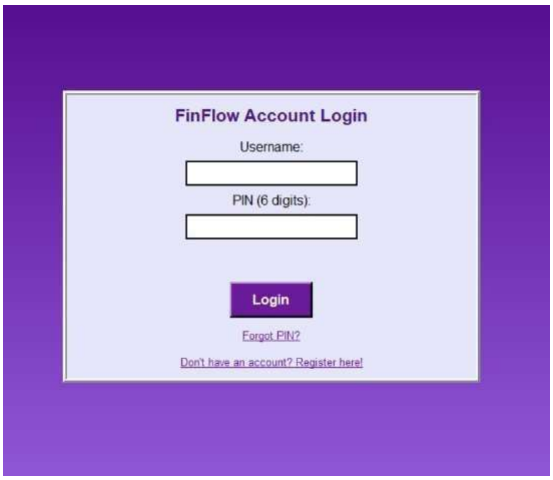

Fig.4.2. Login page

C. Transaction Pin:

The fig 4.3.1 shows the transaction pin page where user can enter the already set tpin for transactions once logged into the account. It is a 6-digit pin asked every time when performing a transaction for secure transaction. If the user forgets the t-pin or to set tpin for the first time they can set it as shown in fig 4.3.2.

Fig.4.3.1 Transaction Pin

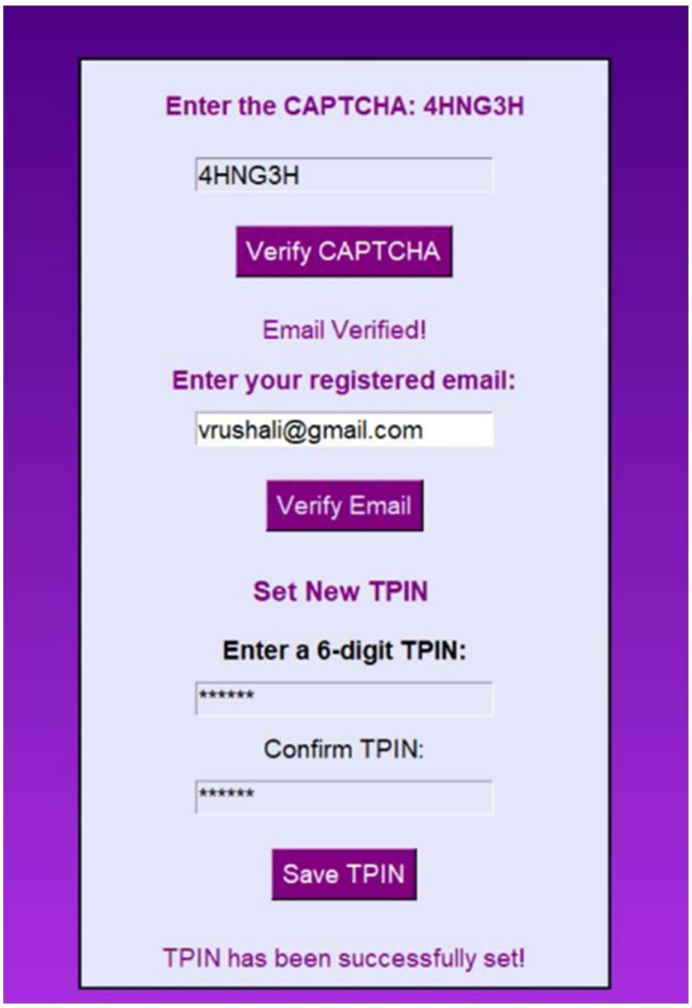

Fig.4.3.2. Setting Transaction Pin

D. Profile:

The profile page shown below in fig 4.4 is depicting user details (i.e. their account number, account holder, username, email, gender, date of birth and age).

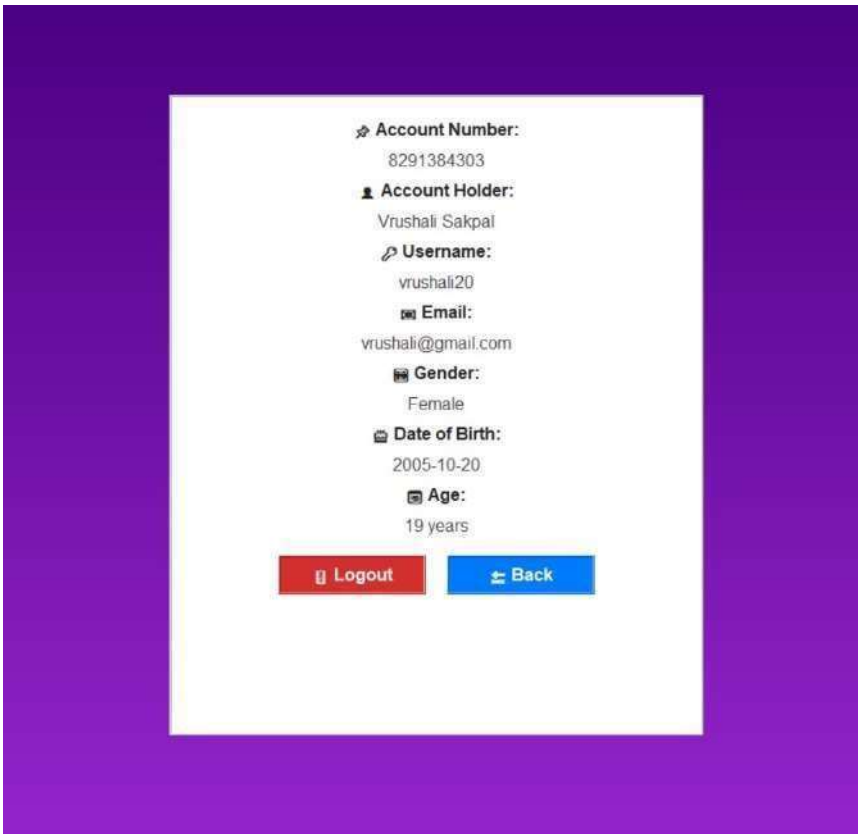

Fig.4.4. Profile Page

E. Dashboard:

The fig 4.5 provides an overview of the dashboard containing user's account details, transaction history, and expense tracking. It serves as the central hub for navigation within the app. The user can set the transaction pin once logged in to sanction secure transaction.

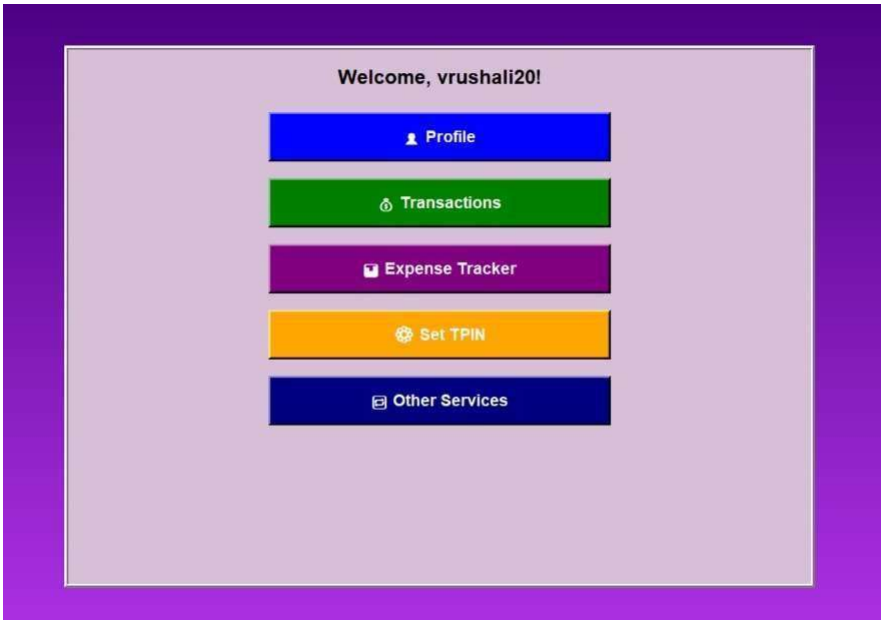

Fig.4.5. Dashboard

F. Transaction Page:

Fig 4.6 demonstrates how users can transfer money as, fig 4.8 refers to transaction history, and check their balance securely as shown in fig 4.7.

Fig.4.6. Transaction Page

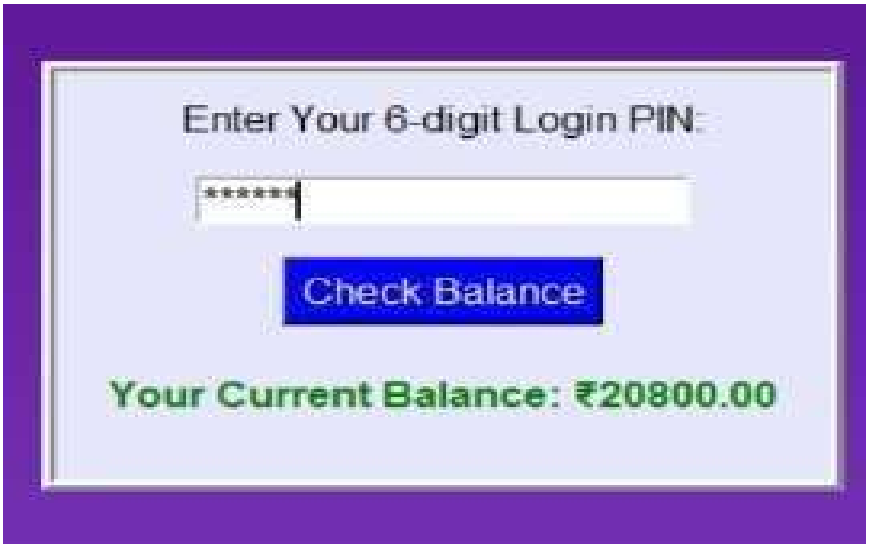

Fig.4.7. Check Balance

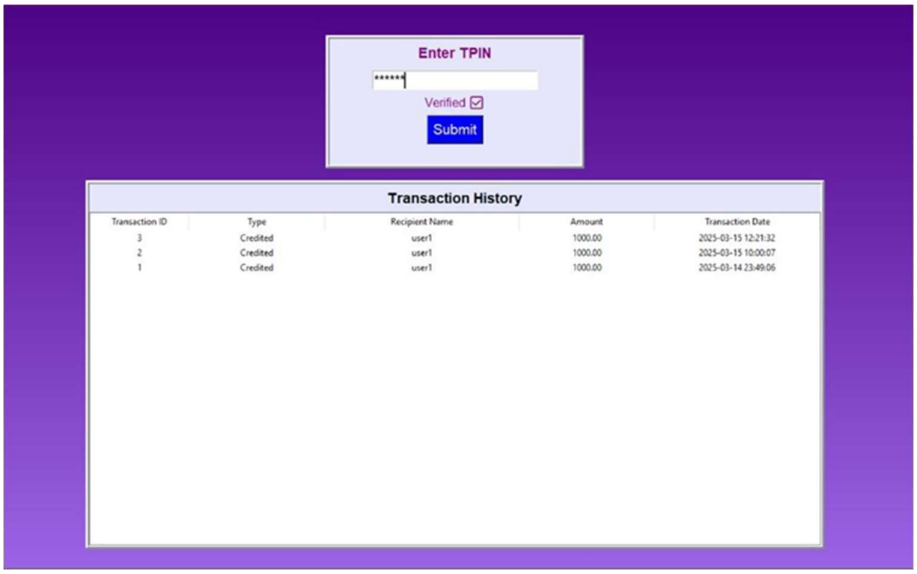

Fig.4.8. Transaction History

Fig.4.9. Transfer Money

G. Expense Tracker:

The expense tracker in fig 4.10 helps users monitor their spending patterns on monthly basis as seen in fig 4.11 and categorize expenses as depicted in fig 4.12 for better financial planning.

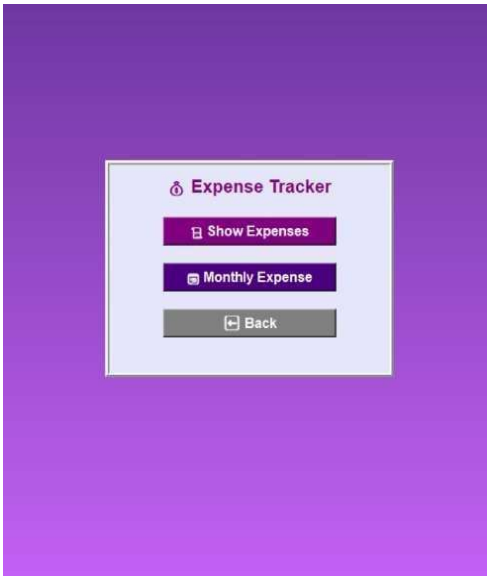

Fig.4.10. Expense Tracker Menu

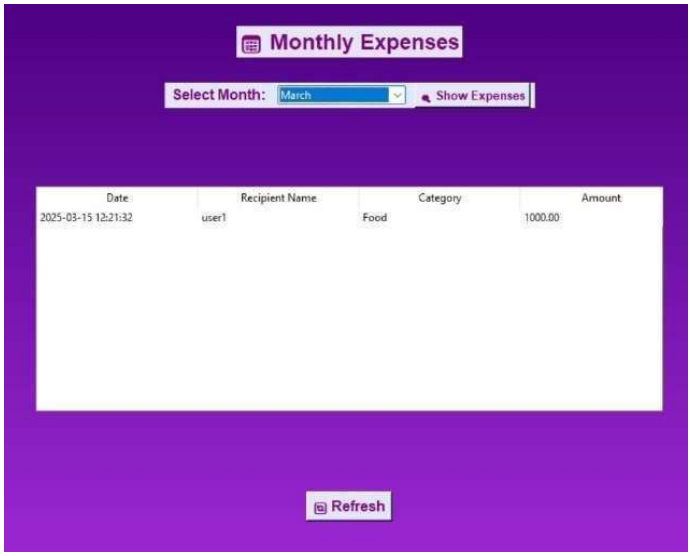

Fig.4.11. Based on Monthly Expense

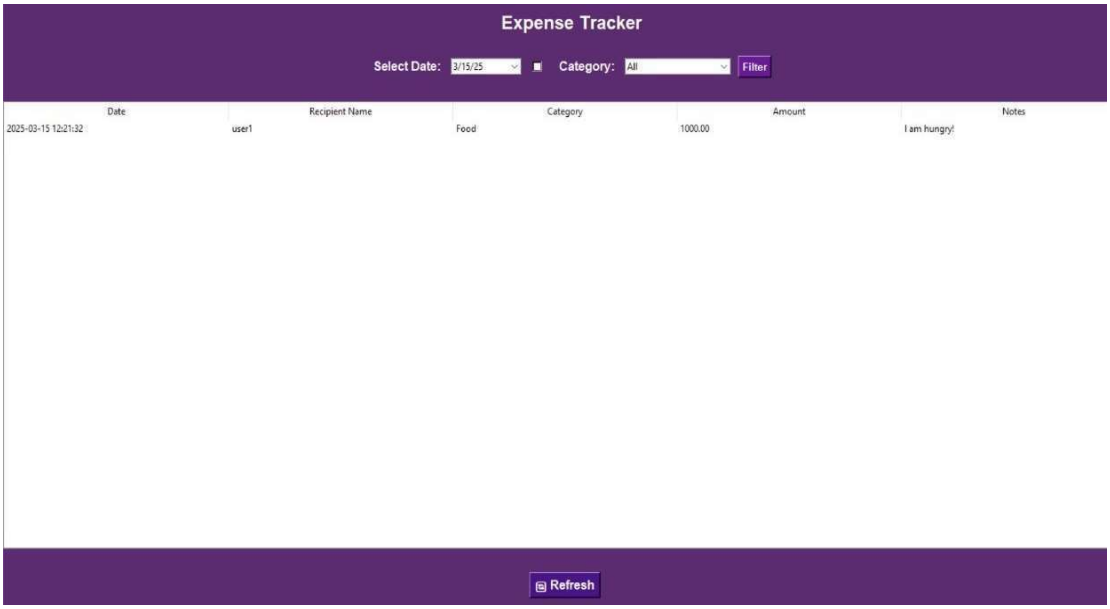

Fig.4.12.Expense Tracker

H. Other Services:

This page includes services which help the user to ask for money from another user by pinging them with a request message containing the information for required amount as seen in fig 4.14.The manage request allows the user to track their sent requests and either accept or reject any received request which is shown in fig 4.15. The user can request for loan which will be accepted or rejected based on whether the required criteria is met.

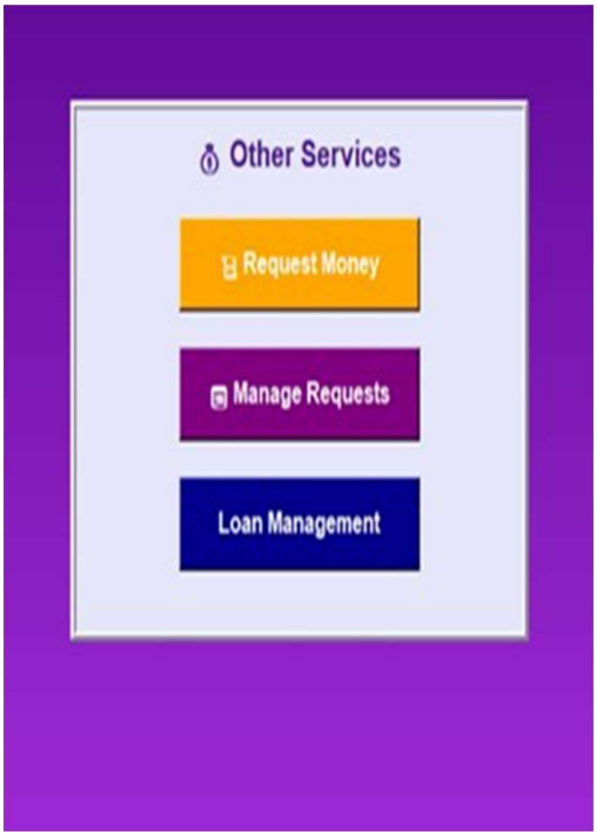

Fig.4.13. Other Services Menu

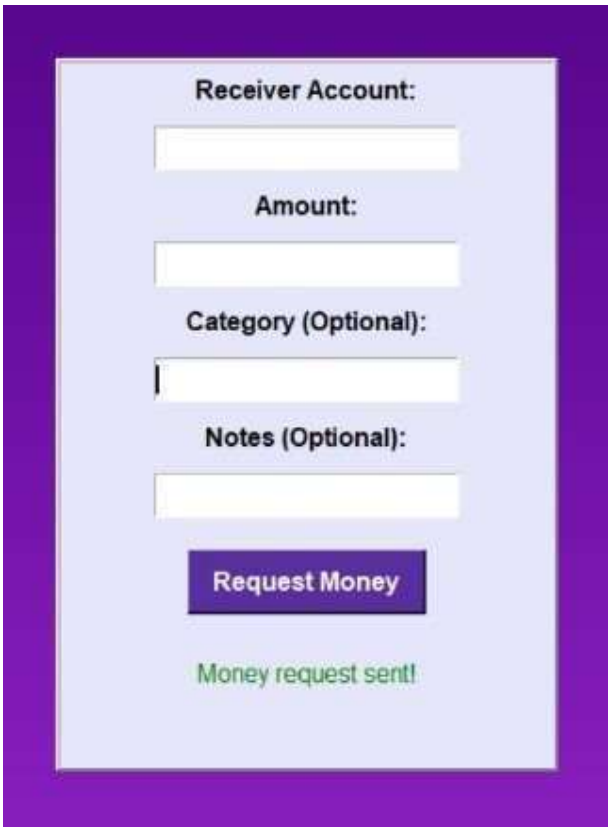

Fig.4.14. Requesting Money

Fig.4.15. Manage Request

Fig.4.16. Loan Management Page

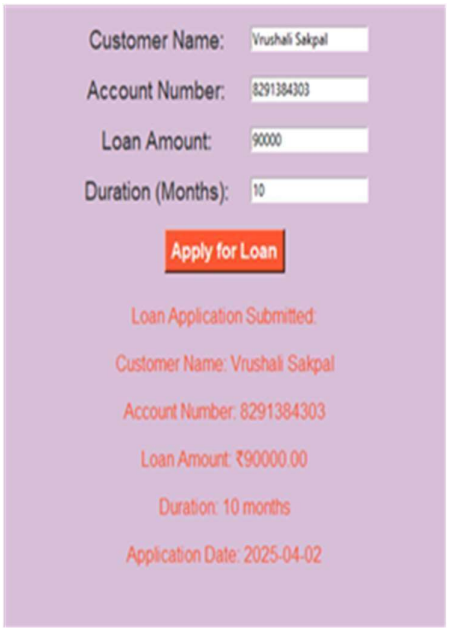

Fig.4.17. Loan Application Page

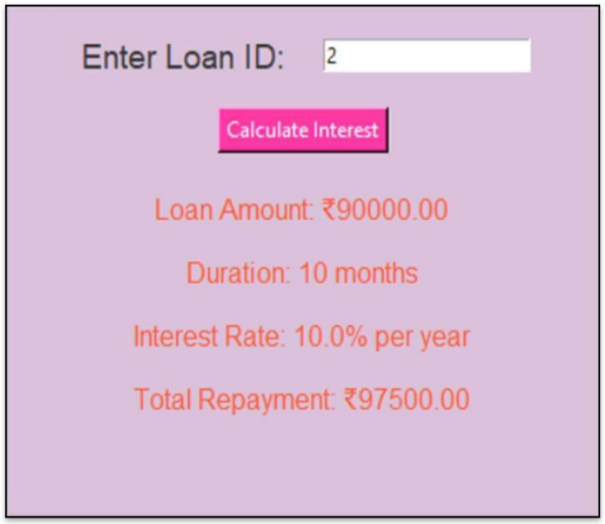

Fig.4.18. Loan Interest Calculation

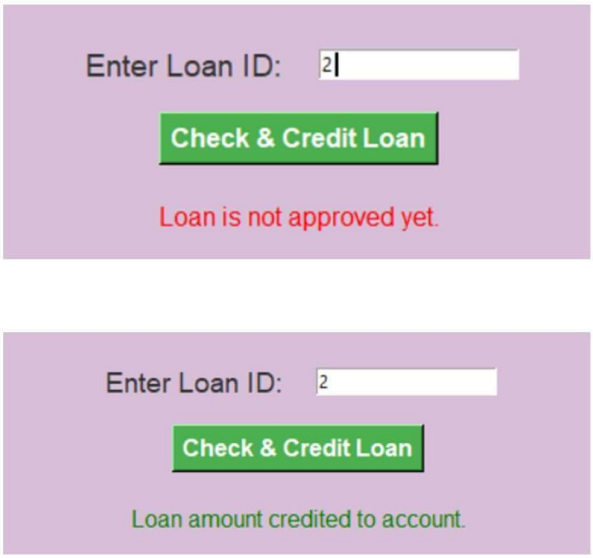

Fig.4.19. Loan Credit Page

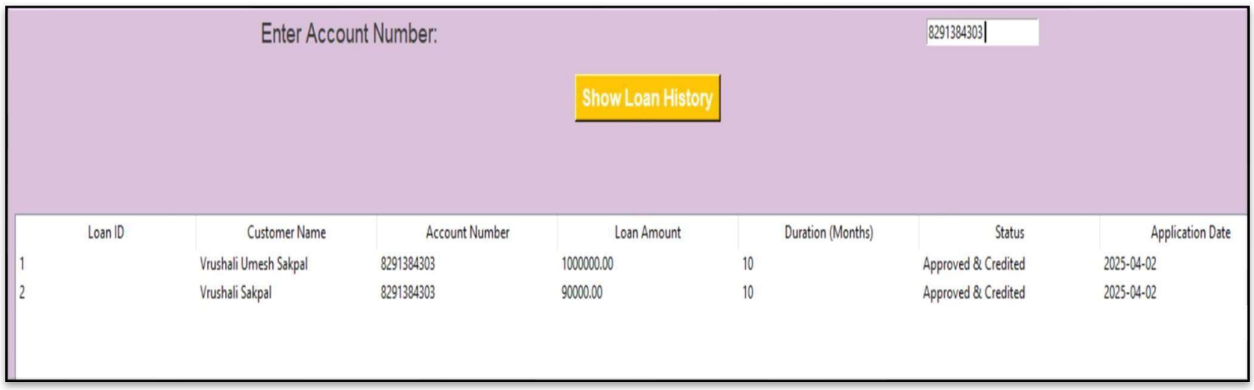

Fig.4.20. Loan History Page

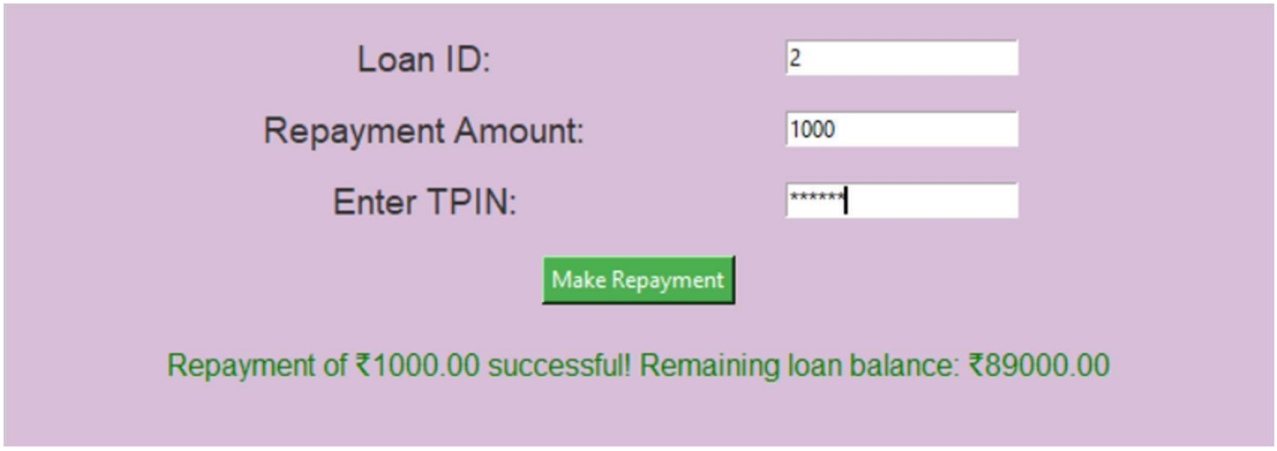

Fig.4.21. Loan Repayment Page

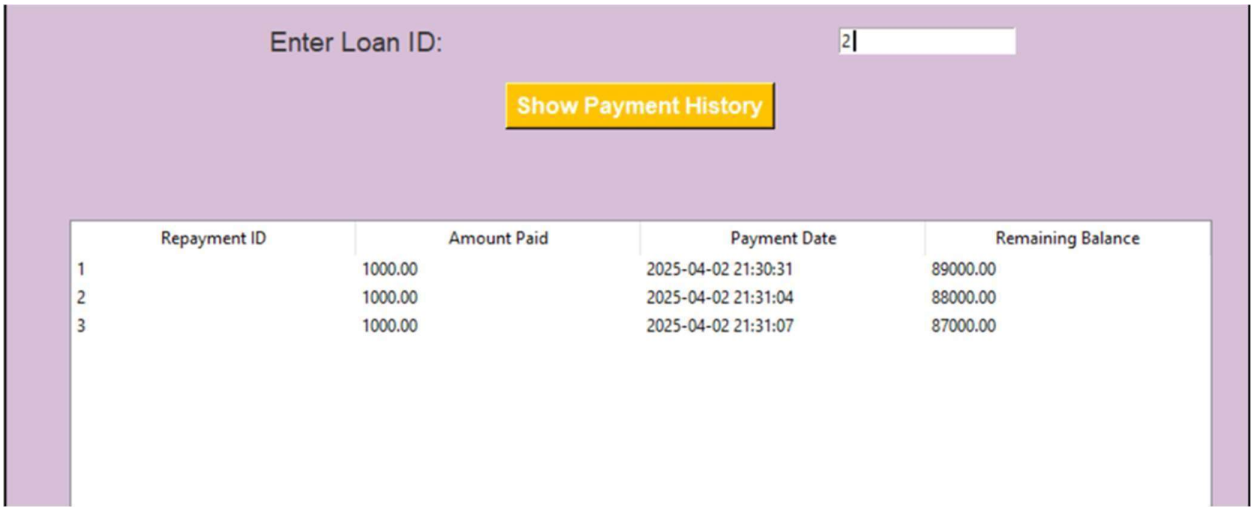

Fig.4.22. Loan Repayment History Page

I. Database:

The Bank Management Database consists of following tables:

- User table in fig 4.21 is used to stores information which includes account number, account holder, pin, tpin, and etc. These details help in verification process ensuring user safety.
- Expense table in fig 4.22 keeps track to user's transaction and consists of information like transaction id, category, account number, and etc. Helping to analysis users spending patterns.
- Money request table in fig 4.23 consists of transaction details like sender account number, receivers account number, amount, and etc.
- Loan table in fig 4.24 stores the data of users who applied for loan.
- Loan-repayment table in fig 4.25 stores the data of users whose loans are accepted.
- Transaction table in fig 4.26 aids to keep track of all the request on and the current status of these requests

Table: users

Columns:

id	int AI PK
account_number	bigint
account_holder_name	varchar(100)
username	varchar(50)
email	varchar(100)
gender	varchar(10)
dob	date
pin	varchar(64)
balance	decimal(10,2)
tpin	varchar(255)

Fig.4.23 User Database

Table: expenses

Columns:

id	int AI PK
account_number	bigint
transaction_id	int
category	varchar(50)
amount	decimal(10,2)
expense_date	timestamp
notes	text

Fig.4.24 Expense Database

Table: money_requests_v2

Columns:

request_id	int AI PK
request_sender	varchar(255)
request_receiver	varchar(255)
amount	decimal(10,2)
category	varchar(255)
notes	text
status	varchar(50)
request_date	timestamp

Fig.4.25 Money Request Database

Table: loan_repayments

Columns:

repayment_id	int AI PK
loan_id	int
amount_paid	decimal(10,2)
payment_date	timestamp
remaining_balance	decimal(10,2)

Fig.4.26 Loan repayment Database

Table: loans

Columns:

loan_id	int AI PK
customer_name	varchar(255)
loan_amount	decimal(10,2)
loan_duration	int
loan_status	varchar(50)
remaining_balance	decimal(10,2)
interest_rate	decimal(5,2)
total_repayment	decimal(10,2)
account_number	varchar(20)
application_date	date

Fig.4.27 Loan Database

Table: transactions

Columns:

id	int AI PK
sender_account	varchar(20)
receiver_account	varchar(20)
amount	decimal(10,2)
transaction_date	timestamp
category	varchar(50)
notes	text
transaction_type	enum('income','expense','transfer','debit')

Fig.4.28 Transaction Database

CHAPTER 5

CONCLUSION

5.1 Conclusion

The development of the banking app successfully meets the primary objective of providing users with an accessible, secure, and user-friendly platform for financial transactions. The app integrates core banking functionalities such as money transfers, expense tracking, and transaction history, ensuring a seamless user experience. The implementation of security measures like TPIN authentication further enhances data protection. The banking app thus serves as an essential tool in modern digital banking, helping users efficiently manage their finances. As the world moves towards digital transformation, traditional banking methods are becoming outdated and inconvenient. Long queues and travel for simple transactions create unnecessary hassle. FinFlow offers a modern solution by providing a quick, secure, and efficient way to manage banking needs digitally. Embracing digital banking ensures convenience, accessibility, and enhanced financial management for everyone.

5.2 Challenges and Future Scope

The development and implementation of the Bank Management System come with several challenges and future opportunities. One of the main challenges lies in ensuring high-level security for user data and transactions, as financial platforms are frequent targets of cyber threats. Protecting sensitive information through robust encryption, multi-factor authentication, and secure database management is essential but can be resource- intensive. Additionally, handling a large number of concurrent users without system lags, ensuring uptime, and managing scalable infrastructure pose technical difficulties. Another concern is user adoption, especially for individuals unfamiliar with digital banking, which requires intuitive design and user education. Regulatory compliance also presents a continuous challenge, as the system must adhere to evolving financial and data protection laws across different jurisdictions. Despite these challenges, the future scope of the system is promising. Features such as mobile app integration, biometric authentication (like fingerprint or facial recognition), and AI-based analytics can enhance both security and user experience. The use of blockchain technology may provide added transparency and security in transaction records, while support for international and multi-currency transactions could broaden the platform's reach. Additionally, chatbots and virtual assistants can offer real-time support, and tools like expense forecasting, smart budgeting, and fraud detection can make the system more intelligent and user-centric. With continuous improvement and technological upgrades, the Bank Management System has the potential to evolve into a comprehensive, modern digital banking solution.

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