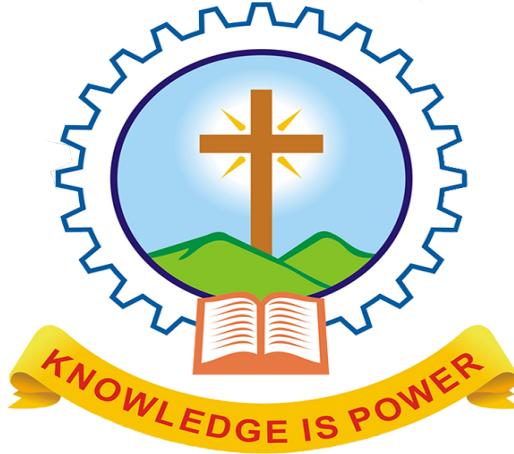


BANKING SYSTEM

Mini Project Report
Submitted in partial fulfillment for the award of the degree
of
BACHELOR OF TECHNOLOGY
IN
COMPUTER SCIENCE AND ENGINEERING (DATA SCIENCE)
of

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY



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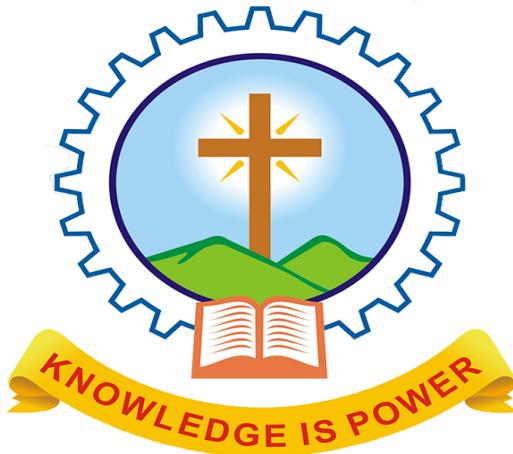
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UNDER THE GUIDANCE OF

Prof. Manju Mathews , Prof. Anu Eldho
(Academic Year - 2022-2023)

**DEPARTMENT OF COMPUTER SCIENCE AND
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MAR ATHANASIUS COLLEGE OF ENGINEERING
KOTHAMANGALAM
JANUARY 2023

**DEPARTMENT OF COMPUTER SCIENCE AND
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2022-2023**



CERTIFICATE

This is to certify that the report entitled “**Banking System**” submitted by **Ms. Anagha Anna Mathew (MAC20CD010)**, **Mr.Ashmin Jayson (MAC20CD015) & Mr.Krishnajith A (MAC20CD030)** to the APJ Abdul Kalam Technological University in partial fulfillment of the requirements for the award of the Degree of Master of Technology in Computer Science & Engineering for the academic year 2022-2023 is a bonafide record of the project presented by them for the year under our supervision and guidance. This report in any form has not been submitted to any other university or institute for any purpose.

Manju Mathews

Anu Eldho

Project Coordinator

Date

Department Seal

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ABSTRACT

A banking system project is a comprehensive effort aimed at modernizing and transforming traditional banking operations. The project involves the development of software applications and their integration with existing systems to automate and streamline various processes, such as account management, loan processing and transactions . The implementation of a banking system project is expected to bring about numerous benefits, including increased efficiency, improved security, and enhanced customer experience.

One of the key features of a banking system project is real-time account updates, which allow customers to access accurate information about their accounts 24/7. This feature also enables customers to perform transactions online, such as money transfers, bill payments, and check deposits, from the comfort of their own homes. In addition, the project may include a mobile banking component, which will allow customers to perform transactions and check their account information on the go using their smartphones or other mobile devices.

The goal of a banking system project is to provide customers with convenient and accessible services while ensuring the security of their sensitive information and transactions. The project is expected to lead to a reduction in manual labor, improved accuracy, and faster processing times. Additionally, it will enable the bank to stay competitive in the market and offer new and innovative services to its customers. Overall, a banking system project is a critical investment for any financial institution looking to modernize and transform its operations for the future.

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CHAPTER 1

PROBLEM STATEMENT

To develop a website for a Banking System that features investment banking as well as procurement and repayment of loans along with other user aiding functionalities such as transaction management and expense tracking. It comprises of various features that enable a user to interact with the specific banking services such as credit and debit, sanctioning of loans as well as to make investments.

CHAPTER 2

INTRODUCTION

The banking industry has undergone a significant transformation in recent years, with the introduction of digital technologies and the rise of mobile and online banking. Customers now expect a more convenient, accessible, and secure banking experience, and traditional banks are having to adapt to meet these demands. This project aims to address these challenges by designing and implementing a comprehensive banking system that incorporates the latest technology and meets the needs of the modern banking industry.

The system will offer a range of features, including account management, transactions, loans, and investment options, all accessible through a user-friendly interface. Customers will be able to access their accounts 24/7, perform transactions, and manage their finances from anywhere with an internet connection. The system will also incorporate advanced security measures, such as multi-factor authentication and encryption, to protect customers' financial information and assets.

In addition to providing customers with a better banking experience, the system will also offer benefits to the bank itself. By automating many of the manual processes that are currently performed by employees, the bank will be able to increase efficiency and reduce operating costs. The system will also provide the bank with valuable insights into customer behavior and preferences, allowing it to offer more personalized and relevant products and services.

The project will be executed in several phases, beginning with the development of a detailed requirements specification that outlines the functional and non-functional requirements of the system. This will be followed by the design and implementation of the system, with close collaboration between the development team and stakeholders to ensure that the system meets their needs and expectations. Finally, the system will be thoroughly tested and evaluated, and any necessary modifications will be made before it is rolled out to customers.

CHAPTER 3

PROPOSED SYSTEM

We are proposing a system which is capable of doing multiple tasks and being an efficient platform for customers of a bank to interact with the bank and to access their accounts.

This Project aims the following functionalities:

- A main login page through which the users can log into their accounts by providing their username and the corresponding password. They can proceed from this page only if the credentials are found to be correct.
- After the customers complete the log in process they are redirected to a main page where they are greeted and the most relevant details to their account, like their investment and loan information and their balance are shown.
- There are mainly 3 functionalities that is provided to the customer- Investment, Account to account transaction and loans.
- The user can apply for a loan and the loan is then sent to approval to the admin and if the admin approves it then the intended amount of loan is credited to the customer's account
- The user can do investments and the investments are approved if there is sufficient balance in the account of the investor.
- When a person does an account to account money transaction, the amount is debited from the account of the sender if sufficient balance is available and is credited to the account of the receiver.
- A page for the admin, in which they can login and using this page the admin can do a variety of functions like sanctioning a loan, manage accounts etc.

This project aims to provide a cutting-edge banking system that offers customers a more convenient, secure, and efficient banking experience. By leveraging the latest technology and incorporating advanced security measures, the system will set a new standard for the banking industry and provide a competitive advantage for the bank. We are confident that the success of this project will be driven by the hard work and dedication of the development team, and we look forward to the successful delivery of the system.

CHAPTER 4

DATABASE DESIGN

Tables

Accounts(accno,account_type,branch,ifsc_code,name,password,phone_number)

Balance_details(accno,balance,min_balance)

Investments(investment_id,accno,amount,interest_rate,investment_date,maturity_date,duration,matured_amount)

Loans(loan_id,accno,amount,interest_date,procurement_date,repayment_deadline,duration,repayable_amount,status)

Transactions(transaction_id, sender_accno, recipient_accno, amount, transaction_date, status)

The Database consists of 5 tables as mentioned above. When a user creates an account ,his account details are read into the accounts table. The balance details of each user is automatically read into the balance_details table using the accno as reference from the accounts table. When a transaction is made, a transaction_id is created and all related details are stored into the transactions table. Similarly for investments and loans taken by the user,a loan_id and investment_id are created respectively and stored into respective tables. Transactions,Loans and Investments tables are all made on basis of the accno referenced from the Accounts table.

ACCOUNTS TABLE

| Column | Type | Default Value | Nullable |
|--------------|-------------|---------------|----------|
| accno | int | | NO |
| account_type | varchar(30) | | NO |
| branch | varchar(30) | | NO |
| ifsc_code | varchar(30) | | NO |
| name | varchar(30) | | NO |
| password | varchar(30) | | NO |
| phone_number | bigint | | NO |

BALANCE_DETAILS TABLE

| Column | Type | Default Value | Nullable |
|-------------|------|---------------|----------|
| accno | int | | NO |
| balance | int | | NO |
| min_balance | int | | NO |

INVESTMENTS TABLE

| Column | Type | Default Value | Nullable |
|-----------------|-------------|---------------|----------|
| accno | int | | NO |
| amount | int | | NO |
| duration | varchar(45) | | YES |
| interest_rate | float | | YES |
| investment_date | date | | NO |
| investment_id | int | | NO |
| matured_amount | varchar(45) | | YES |
| maturity_date | date | | NO |

LOANS TABLE

| Column | Type | Default Value | Nullable |
|--------------------|-------------|---------------|----------|
| accno | int | | NO |
| amount | int | | NO |
| duration | int | | YES |
| interest_rate | float | | YES |
| loan_id | int | | NO |
| procurement_date | date | | NO |
| repayable_amount | int | | YES |
| repayment_deadline | date | | NO |
| status | varchar(45) | | YES |

TRANSACTIONS TABLE

| Column | Type | Default Value | Nullable |
|------------------|-------------|---------------|----------|
| amount | int | | NO |
| recipient_accno | int | | NO |
| sender_accno | int | | NO |
| status | varchar(45) | | YES |
| transaction_date | date | | NO |
| transaction_id | int | | NO |

CHAPTER 5

IMPLEMENTATION DETAILS

5.1 SYSTEM REQUIREMENT SPECIFICATIONS

5.1.1. Hardware Specification

- CPU: Intel Core i7 9750h
- Memory: 8GB
- Cache: 12 MB
- Hard Disk: 512 GB
- Display: 15" Monitor
- Keyboard: Standard Keyboard
- Mouse: Standard Mouse

5.1.2. Software Specification

- Operating System: Windows OS
- Front End: HTML,CSS
- Back End: Flask framework, MySQL Database

5.1.3. Front End

5.1.3.1. HTML

HTML, or Hypertext Markup Language, is the standard markup language used to create web pages and provide their structure and content. HTML was first developed in the late 1980s and has since become an essential tool in the world of web development. HTML code is written using a text editor and is interpreted by web browsers to display the web page to users.

HTML consists of a series of tags and attributes that define the structure and content of a web page. The tags in HTML provide the basic structure for a web page, such as headings, paragraphs, images, and links. The attributes of the tags provide additional

information about the elements, such as size, color, and location. HTML has evolved over the years, with new tags and features being added to provide additional functionality, such as the ability to include multimedia content and create interactive forms.

It is important to note that HTML is not a programming language, but rather a markup language. This means that it provides the structure and content of a web page, but does not provide any functionality or interactivity. For this reason, HTML is often used in combination with other technologies, such as CSS and JavaScript, to create dynamic and interactive websites.

5.1.3.2. CSS

CSS, or Cascading Style Sheets, is a stylesheet language used to describe the look and formatting of a web page written in HTML. CSS is used to separate the presentation of a web page from its content, making it easier to maintain and update. It provides a way for developers to apply styles, such as colors, fonts, and spacing, to a web page in a consistent and organized manner.

CSS has a number of powerful features that allow developers to control the look and layout of a web page. For example, CSS can be used to create responsive designs that adjust to the size of the screen, making a web page look great on any device. CSS also provides a way to target specific elements on a web page and apply styles to them, allowing developers to create complex and sophisticated designs.

CSS is an essential tool for anyone involved in web development and is used in conjunction with HTML to create dynamic and interactive websites. A basic understanding of CSS is essential for anyone who wants to create a website or work with web development, as it provides the means to control the look and presentation of a web page.

5.1.4. Back End

5.1.4.1. Flask Framework

Flask is a micro web framework for Python that provides a lightweight and flexible tool for creating web applications. It is designed to be simple and easy to use, making it a popular choice for developers of all skill levels. Flask is based on the idea of providing

only what is necessary, allowing developers to add the necessary components as they build their application.

One of the key features of Flask is its modular design, which allows developers to easily add or remove components as needed. This makes it easy to customize and extend, allowing developers to build complex applications with ease. Flask also provides a number of tools and features to simplify common web development tasks, such as handling HTTP requests, managing templates, and connecting to databases.

Another advantage of Flask is its strong community support. With a large and active community of developers, there are many resources available to help you learn and use Flask, including tutorials, guides, and forums. Flask is also compatible with a variety of databases and front-end technologies, making it a versatile choice for web development.

5.1.4.2. MySQL Database

MySQL is an open-source relational database management system that is widely used to store, organize, and retrieve data. It is a popular choice for web-based applications and provides a robust and scalable solution for managing large amounts of data. MySQL is easy to set up and use, making it a good choice for both beginner and advanced users.

MySQL supports SQL, the standard language used to manage relational databases, making it easy to interact with data stored in the database. It provides a variety of data types, including numbers, strings, and dates, and supports multiple storage engines, allowing developers to choose the best option for their specific needs.

MySQL is known for its reliability, stability, and performance, making it an ideal choice for a wide range of applications, including e-commerce websites, content management systems, and data analytics. With its large community of users and developers, there are many resources available to help you learn and use MySQL, including tutorials, forums, and documentation.

5.2. SYSTEM IMPLEMENTATION

The implementation of the aforementioned system consists of the building a web based frontend UI using HTML and CSS and linking it to the backend services via Flask. Flask maintains connectivity to the backend MySQL database using *mysql.connector* python library.

The connection is established on the localhost in it's default port by authentication thorough the database name and the corresponding user password, querying and interfacing is carried out by creating a *cursor* object with the *connection* object as part of it's parameter.

The various user defined python function interact with the mysql workbench through the connector, the invokement of various functions are carried out via submission of various forms on the html page.

Also the predefined SQL procedures are invoked to provide an easier medium of interfacing.

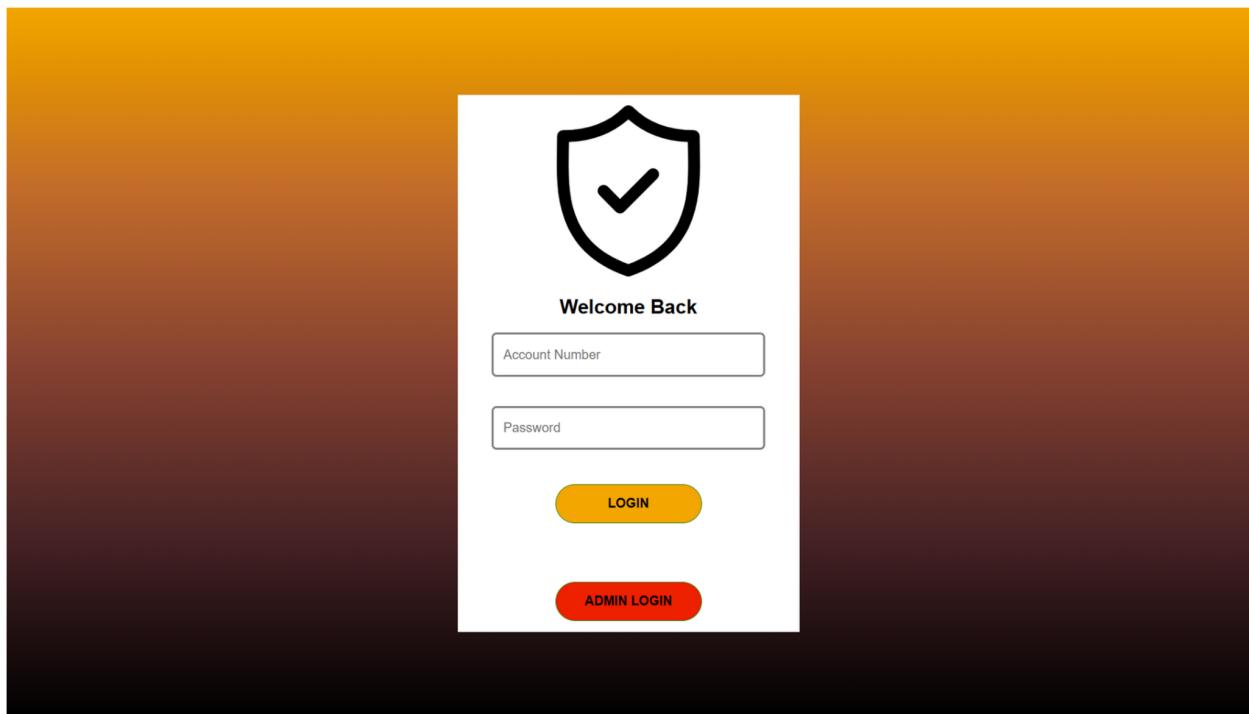
Furthermore dynamic updation of the HTML code is performed through the Jinja2 templating engine supplied as part of the Flask library which enables the dynamic updation of HTML content through a method of parameter passing via python.

CHAPTER 6

RESULT

We have successfully created a banking system that provides all the basics functionalities of the banking service at the tip of our fingers .The goal of a banking system project is to provide customers with convenient and accessible services while ensuring the security of their sensitive information and transactions. The project leads to a reduction in manual labor, improved accuracy, and faster processing times. Additionally, it will enable the bank to stay competitive in the market and offer new and innovative services to its customers. Overall, a banking system project is a critical investment for any financial institution looking to modernize and transform its operations for the future.

WEBSITE PAGES



Hello There Ram!!

Account Balance : 48702
Minimum Balance : 3000

| Transaction ID | Recipient AccNo | Amount | Date of Transaction | Status |
|----------------|-----------------|---------|---------------------|---------|
| 1 | 2 | 100 | 2023-01-03 | SUCCESS |
| 2 | 2 | 10000 | 2023-01-05 | SUCCESS |
| 3 | 2 | 1000000 | 2023-01-05 | FAILED |

| Investment ID | Amount Invested | Interest Rate | Investment Date | Maturity Date | Duration(days) | Maturity Amount | |
|---------------|-----------------|---------------|-----------------|---------------|----------------|--------------------|-------------------------|
| 1 | 10000 | 7.0 | 2023-01-05 | 2028-10-05 | 2100 | 14027.394782027159 | CLOSE INVESTMENT |

| Loan ID | Amount | Interest Rate | Repayment Date | Procurement Date | Duration(in days) | Repayable Amount | Loan Status | |
|---------|--------|---------------|----------------|------------------|-------------------|------------------|-------------|-------------------|
| 2 | 1000 | 11.3 | 2023-01-03 | 2026-06-16 | 1260 | 1390 | Sanctioned | REPAY LOAN |

New Transaction**New Investment****New Loan****Sender Account Number : 1****Account Number : 1**

Recipient Account Number

Amount

Amount

dd-mm-yyyy

**Initiate Transaction****Open Investment**

The interest rate is levied at an increment of 0.1% for each month upto a maximum of 7% and the invested amount is not compounded

Enter Loan Details

Loan Amount

Repayment Date



Apply For Loan

The interest rate is levied at an increment of 0.15% for each month upto a maximum of 25% and the loan amount is not compounded

ADMIN LOGIN

Enter the admin login password :

LOGIN

ADMIN PORTAL

Account Details

| Account No | Name | IFSC Code | Branch | Phone Number | Account Type |
|------------|-------|--------------|------------|--------------|--------------|
| 1 | Ram | FDRLL0001164 | KOTTAPPADY | 9076347823 | SB |
| 2 | Pam | FDRLL0001164 | KOTTAPPADY | 9076456782 | NRI |
| 3 | Shyam | FDRLL0001164 | KOTTAPPADY | 9023434782 | NRE |
| 4 | Kiran | FDG | kit | 2313213 | SB |

Balance Details

| Account No | Current Balance | Minimum Balance | Credit Amount |
|------------|-----------------|-----------------|-----------------------------------------------------------------------------------------------------------------------------------|
| 1 | 48702 | 3000 | <button style="background-color: red; color: white; border-radius: 10px; padding: 5px 15px; border: none;">Credit Amount</button> |
| 2 | 120100 | 10000 | <button style="background-color: red; color: white; border-radius: 10px; padding: 5px 15px; border: none;">Credit Amount</button> |

| | | | |
|---|-------|------|-----------------------------------------------------------------------------------------------------------------------------------|
| 3 | 55000 | 5000 | <button style="background-color: red; color: white; border-radius: 10px; padding: 5px 15px; border: none;">Credit Amount</button> |
| 4 | 4000 | 3000 | <button style="background-color: red; color: white; border-radius: 10px; padding: 5px 15px; border: none;">Credit Amount</button> |

Transaction Details

| Transaction ID | Sender AccNo | Recipient AccNo | Amount | Date of Transaction | Status |
|----------------|--------------|-----------------|---------|---------------------|---------|
| 1 | 1 | 2 | 100 | 2023-01-03 | SUCCESS |
| 2 | 1 | 2 | 10000 | 2023-01-05 | SUCCESS |
| 3 | 1 | 2 | 1000000 | 2023-01-05 | FAILED |

CHAPTER 7

CONCLUSION

The need for a well organized banking system has been analysed and understood. The proposed system is efficient and saves time and effort. It also eliminates unnecessary expenses.

A well-organized banking system has several advantages, including:

- Increased Efficiency: A well-organized banking system can streamline processes and automate many tasks, resulting in increased efficiency and faster transactions.
- Improved Customer Service: With a well-organized banking system, customers can access their accounts, make transactions, and receive support more easily, improving their overall experience.
- Enhanced Security: A well-organized banking system can provide stronger security measures to protect customer information and prevent fraud.
- Better Risk Management: A well-organized banking system can help identify and mitigate potential risks, improving the overall stability of the banking system.
- Increased Accuracy: Automated processes and increased efficiency can reduce errors and increase accuracy in financial transactions.
- Better Data Management: A well-organized banking system can provide better tools for managing customer data and information, making it easier to track customer activity and make informed decisions.

CHAPTER 8

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