

# National University of Computer and Emerging Sciences



## Database Systems Lab Project Report **Bank Management System**

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Database Systems Lab  
Spring 2024  
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# 1. Introduction:

**Title:** Bank Management System (Website Application)

**Application Name:** DigiBank

A comprehensive web application for bank management developed for the Database Systems Lab at FAST-NU, Lahore. DigiBank integrates advanced security measures including facial recognition for user authentication and provides a robust interface for managing customer accounts, transactions, loans, and credit cards. The scope of the project includes developing a user-friendly interface with robust features tailored to both customers and bank staff.

## 2. Main Features:

### ➤ Admin Interface:



- i. Secure Password Login: Ensure secure access for the admin.



ii. Bank Staff Management: View, manage, and assign roles to bank staff.

The screenshots show the following pages:

- Add Staff Member:** A form for entering staff member details like First Name, Last Name, Middle Name, Date of Birth, Gender, Address, City, State, Zip, and Phone Number. It includes a 'Save' button and a large orange 'Add' button at the bottom.
- Remove Member:** A form for removing a staff member by entering their First Name, Last Name, and Member ID. A 'Remove' button is present.
- Update Staff Member Information:** A form for updating staff member information for a specific member ID (e.g., 4). Fields include First Name, Last Name, Designation, Gender, Email Address, Phone Number, and Address. An 'Update' button is at the bottom.
- Bank Staff Information:** A detailed view of a staff member's profile. It shows the member ID (4), first name (Hassan), last name (Mustafa), designation (Financial Products Coordinator), gender (Male), email (hassan@digibank.com), phone number (1234567890), address (123 Main Street, Anytown, USA), and a photo of the staff member.

iii. Client Data Viewing: Access and review clients' data.

The screenshot shows the "Client Information" page. It displays a table of client data with columns: Client ID, First Name, Last Name, and CNIC. The data is as follows:

Client ID	First Name	Last Name	CNIC
1	Ali	Siddique	1234567890
2	Mohammad	Tayyab	1234567890
3	Aman	Dhahab	1234567890
4	Warran	Shahzad	1234567890

Below the table is a form for adding new client information, including fields for First Name, Last Name, Gender (Male/Female), Date of Birth, Email Address, Address, Telephone Number, and Zip Code. There is also a photo placeholder and a "Submit" button.

iv. Loans Management: Accept or reject loan applications.

The screenshot shows the "Loan Applications" page. It displays a table of loan applications with columns: Loan ID, Client ID, Loan Type, and Status. The data is as follows:

Loan ID	Client ID	Loan Type	Status
1	1	Car Loan	Pending
2	3	Student	Not Approved
3	3	Student	Pending

Below the table is a form for managing the status of a loan application. It includes fields for First Name, Last Name, Date of Birth, and Zip Code. Buttons for "Approve" and "Not Approve" are present.

- v. Customer Queries: Respond to customer queries and questions via the integrated message box.

## ➤ Bank Staff Interface:

- i. Secure Password Login: Ensure secure access for bank staff.

- ii. Account Manager: Enter, verify, and update client data and account details.

**Add New Client**

**Remove Client**

**Client Information**

**Update Client Information**

**Create Account**

**Accounts Information**

### iii. Transaction Manager: Efficiently manage client transaction records.

**WELCOME**

**Deposit & Withdraw**

To simply deposit or withdraw money fill out some information of client, which is one button away.

**Click Now**

**Transaction History**

To simply check the transaction history of a client, click on the button.

**Check Now**

**Who we are**

**Help desk**

**Features**

**Subscribe to our newsletter**

**Home**

**Contact us**

**Money Transfer**

**Email address**

**About us**

**Feedbacks**

**Credit Cards**

**Subscribe**

**Services**

**Branches**

**Easy Loan Installments**

**24/7 Customer Support**

"We DO what we say & we own what we DO"

**Transaction Process**

This section allows users to perform deposits or withdrawals. It features input fields for Account ID, Amount, and Date, along with 'Deposit' and 'Withdraw' buttons. A large orange upward-pointing arrow graphic is positioned to the right of the form.

**Transactions History**

This section displays a table of transaction history. The columns include Trans ID, Transaction Type, Account ID, and Transaction Date. The table shows six entries, each with a timestamp and a 'Delete' button.

Trans ID	Transaction Type	Account ID	Transaction Date
1	Deposit	1	5/14/2024 7:00:31 PM
2	Deposit	2	5/14/2024 7:01:11 PM
3	Deposit	5	5/14/2024 7:01:38 PM
4	Withdraw	1	5/14/2024 7:02:17 PM
5	Deposit	3	5/16/2024 7:26:57 PM
6	Withdraw	3	5/16/2024 7:27:16 PM

- iv. Financial Products Coordinator: Review, process, manage, and track client loans and client credit card requests.

**Welcome**

The homepage features a large 'WELCOME' banner. Below it are sections for 'Loans' (with an image of a house and hands applying for a loan) and 'Debit Card' (with an image of a debit card). Each section has 'Apply Now' and 'See Now' buttons.

**Loan Application**

This page contains a form for applying for a loan. Fields include First Name, Last Name, Account ID, and Card Type. An 'Apply' button is at the bottom.

**Loan Information**

This page displays a table of loan information. Columns include Loan ID, Client ID, Loan Type, Status, Loan ID, and Client ID. The table shows two entries: one pending approval and one approved.

Loan ID	Client ID	Loan Type	Status	Loan ID	Client ID
1	1	Student	Pending	1	1
2	3	Student	Not Approved	2	2
3	3	Student	Pending	3	3

**Card Application**

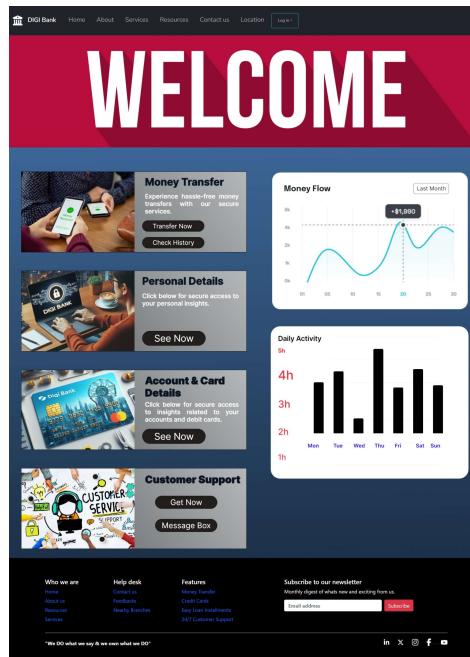
This page contains a form for applying for a card. Fields include First Name, Last Name, Account ID, Card Type, and Zip. An 'Apply' button is at the bottom.

**Card Information**

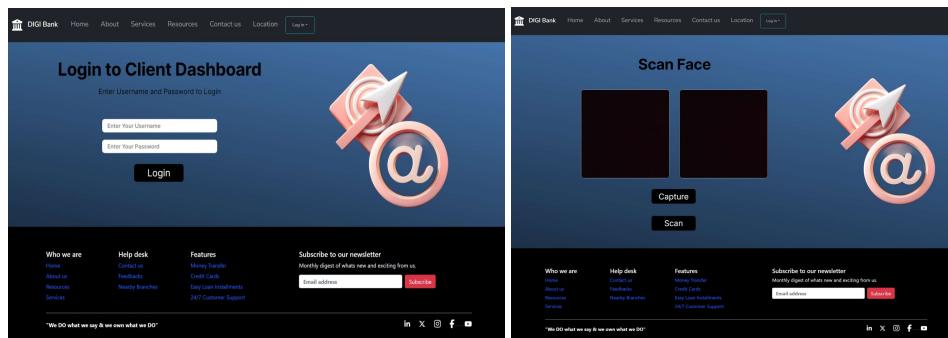
This page displays a table of card information. Columns include Card ID, Account ID, Card Type, Status, Card ID, Account ID, and Card Type. The table shows three entries: one platinum, one gold, and one silver.

Card ID	Account ID	Card Type	Status	Card ID	Account ID
1	1	Platinum	Active	2	2
2	2	Gold	Active	3	3
3	3	Silver	Active		

## ➤ Client Interface:



- Facial Recognition Login: Secure login using facial recognition combined with a password.



- Money Transfer: Perform money transfers.



iii. Transfer History: Access detailed transfer history.

iv. Customer Support: Contact bank representatives through the integrated message box.

v. Personal Details: Check personal details.

vi. Account and Card Details: View account and card details.

Account ID	Account Type	Balance	Status
1	Saving	45000	Active
2	Saving	40500	Active
3	Current	0	Active

Card ID	Account ID	Card Type	Card Number	Pin	Status
1	1	Platinum	24-000000000001	1478	Active
2	3	Gold	24-000000000002	1455	Active
3	3	Silver	24-000000000003	1422	Active

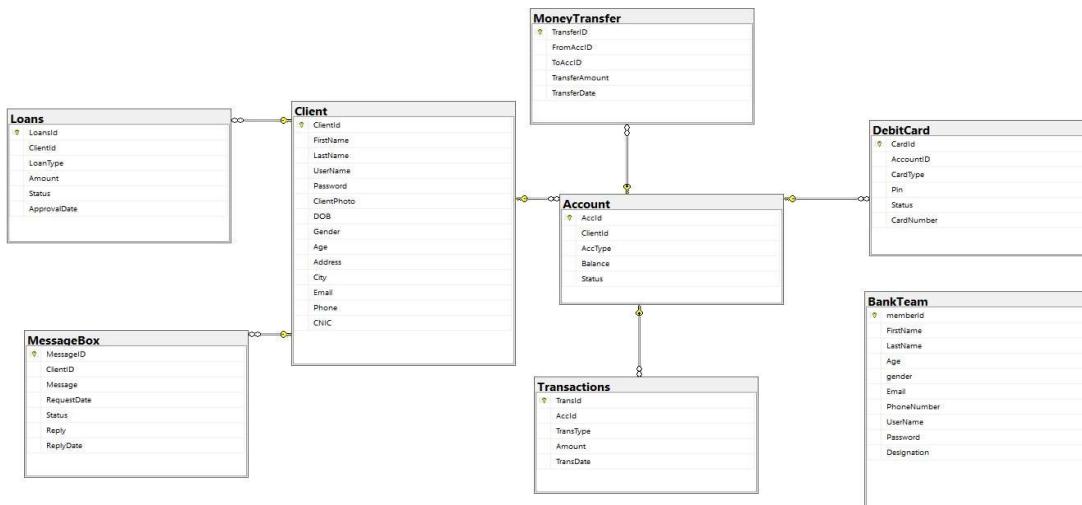
## ➤ Azure Database Integration:

- i. Utilizes Azure database services for efficient management of data.
- ii. Provides secure storage and reliable access to the database from anywhere via the internet.
- iii. Enables scalability and high availability of data through Azure server infrastructure.

## ➤ Facial Recognition:

- i. Implements advanced facial recognition technology using the Google Facenet framework to authenticate clients securely.
- ii. Ensures the integrity of the application by verifying the identity of clients before granting them access to their dashboard.

## 3. Database Schema:



Here's a schema design for our database of Bank Management System (DigiBank):

Tables:

**1. Bank Team:**

- MemberID (Primary Key, Identity(Auto Increment))
- FirstName (Not Null)
- LastName (Not Null)
- Age (Check(Age >= 18), Not Null)
- Gender (Check(Male or Female), Not Null)
- Email (Unique)
- Phone (Unique)
- Username (Unique, Not Null)
- Password (Not Null)
- Designation (Not Null) - Admin, Account Manager, Transaction Manager, Financial Products Coordinator roles.

**2. Clients:**

- ClientID (Primary Key, Identity(Auto Increment))
- FirstName (Not Null)
- LastName (Not Null)
- Username (Unique, Not Null)
- Password (Not Null)
- Client\_Photo (Not Null)
- DateOfBirth (Not Null)
- Gender (Check(Male or Female), Not Null)
- Age (Check(Age >= 18), Not Null)
- Address (Not Null)
- City (Not Null)
- Email (Unique)
- Phone (Unique)
- CNIC (Unique, Not Null)

**3. Accounts:**

- AccountID (Primary Key, Identity(Auto Increment))
- ClientID (Foreign Key referencing Clients table, Not Null)
- AccountType (Check(AccountType = Saving Account OR AccountType = Current Account), Not Null)
- Balance (Default 0, Not Null)
- Status (Default 'Active', Not Null)

**4. Debit Card:**

- CardID (Primary Key, Identity(Auto Increment))
- AccountID (Foreign Key referencing Accounts table, Not Null)
- CardType (Check(CardType = Silver OR CardType = Gold OR CardType = Platinum), Not Null)
- Card Number (16-digit number, Not Null, Unique, Default (CONCAT(RIGHT(YEAR(GETDATE()), 2), '-', LPAD(CAST(CardID AS varchar(14)), 14, '0'))))
- Pin (4-digit password, Not Null)
- Status (Default 'Active', Not Null)

**5. Transactions:**

- TransactionID (Primary Key, Identity(Auto Increment))
- AccountID (Foreign Key referencing Accounts table, Not Null)
- TransactionType (Check (TransactionType = Deposit OR TransactionType = Withdraw), Not Null)
- Amount (Not Null)
- TransactionDate (Not Null, Default GetDate())

**6. Money Transfer:**

- TransferID (Primary Key, Identity(Auto Increment))
- FromAccountID (Foreign Key referencing Accounts table, Not Null)
- ToAccountID (Foreign Key referencing Accounts table, Not Null)
- TransferAmount (Not Null)
- TransferDate (Not Null, Default GetDate())

**7. Loans:**

- LoanID (Primary Key, Identity(Auto Increment))

- ClientID (Foreign Key referencing Clients table, Not Null)
- LoanType (Not Null)
- Amount (Not Null)
- Status () (Check (Status = Pending OR Status = Approved OR Status = Not Approved), Default 'Pending', Not Null)
- ApprovalDate (Default 'Null')

8. **MessageBox:**

- MessageID (Primary Key, Identity(Auto Increment))
- ClientID (Foreign Key referencing Clients table, Not Null)
- Message (Not Null)
- RequestDate (Not Null, Default GetDate())
- Status (Check (Status = In Progress OR Status = Resolved), Not Null, Default 'In Progress')
- Reply (Default 'Waiting for Reply')
- ReplyDate (Not Null, Default GetDate())