Banking Database Management System - ERD Analysis

Group-25

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1. Introduction

This project aims to design and implement a normalized Banking Database Management System using MySQL. The system is capable of managing essential banking functions such as customer onboarding, account management, nominee tracking, document verification, and service request processing.

- Entities and their attributes
- Relationships and their types (One-to-Many, Many-to-Many)
- Mandatory vs. Optional Relationships

2. Entities, Attributes, and Data Types

The database consists of five core tables. Each table contains a primary key that uniquely identifies each record, along with several important attributes.

2.1 Bank Customers

- **Primary Key:** customer id (INT)
- Attributes:
 - Full name (VARCHAR)
 - address (VARCHAR)
 - contact number (VARCHAR)
 - email (VARCHAR)
 - date of birth (DATE)
 - pan number (CHAR)
 - adhaar number (CHAR)
 - gender (VARCHAR)

2.2 Accounts

Primary Key: account id (INT)

- Foreign Key: customer id (INT)
- Attributes:
 - Account number (CHAR)
 - Account type (VARCHAR)
 - Branch code (CHAR)
 - o Initial deposit (DECIMAL)
 - Mode of operation (VARCHAR)

2.3 Nominees

- Primary Key: nominee id (INT)
- Foreign Key: customer id (INT)
- Attributes:
 - o name (VARCHAR)
 - relationship (VARCHAR)
 - o address (VARCHAR)

2.4 Documents

- **Primary Key:** document id (INT)
- Foreign Key: customer id (INT)
- Attributes:
 - Document type (VARCHAR)
 - Document number (VARCHAR)

2.5 Service Requests

- Primary Key: service id (INT)
- Foreign Key: customer id (INT)
- Attributes:
 - Service type (VARCHAR)
 - status (VARCHAR)

3. Relationships and Their Types

I. Bank Customers - Accounts (1:M) [Mandatory-Mandatory]

- Type: One-to-Many (1:M)
- **Cardinality:** One customer can have multiple accounts, but each account belongs to exactly one customer.

Logic:

- A customer may have multiple types of bank accounts (e.g., savings, current).
- o Mandatory (Accounts) An account must be linked to a customer.
- o Mandatory (Customer) A customer must hold at least one account.

II. Bank Customers - Nominees (1:M) [Optional-Mandatory]

- **Type:** One-to-Many (1:M)
- **Cardinality:** One customer can have multiple nominees, but each nominee is linked to one customer.
- Logic:
 - Customers can have multiple nominees for different accounts.
 - o Mandatory (Nominee) A nominee must be linked to a customer.
 - Optional (Customer) A customer may or may not assign nominees.

III. Bank Customers - Documents (1:M) [Mandatory-Mandatory]

- **Type:** One-to-Many (1:M)
- Cardinality: One customer can have multiple documents linked for KYC, but each document belongs to one customer.
- Logic:
 - o Each customer must submit documents like PAN, Aadhaar.
 - Mandatory (Documents) A document must be associated with a customer.
 - Mandatory (Customer) A customer must submit at least one document for verification.

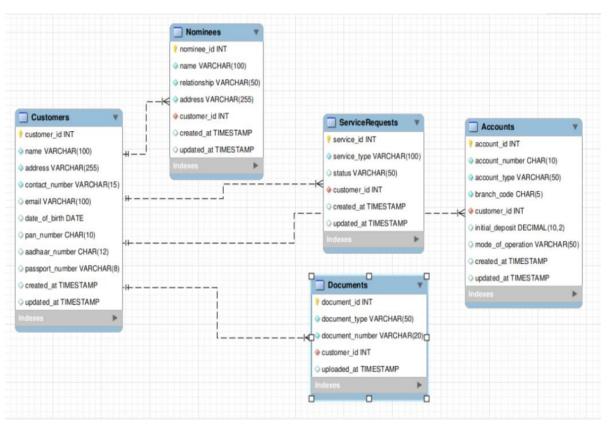
IV. Bank Customers - Service Requests (1:M) [Optional-Mandatory]

- **Type:** One-to-Many (1:M)
- **Cardinality:** One customer can raise multiple service requests, but each request belongs to one customer.

Logic:

- o Customers can request multiple services (e.g., cheque book, debit card).
- Mandatory (Service Requests) A service request must be linked to a customer.
- o Optional (Customer) A customer may not have any service requests.

4.ERD Diagram



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