**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)
  + Initial deposit (DECIMAL)
  + Mode of operation (VARCHAR)

**2.3 Nominees**

* **Primary Key:** nominee id (INT)
* **Foreign Key:** customer id (INT)
* **Attributes:**
  + name (VARCHAR)
  + relationship (VARCHAR)
  + 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).
  + Mandatory (Accounts) - An account must be linked to a customer.
  + 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.
  + 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:**
  + 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:**
  + Customers can request multiple services (e.g., cheque book, debit card).
  + Mandatory (Service Requests) - A service request must be linked to a customer.
  + Optional (Customer) - A customer may not have any service requests.

4.**ERD Diagram**

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