DAMG 6210 - Data Management and Database Design – Wu-Ping Simon Wang

Team 11 – BankHub Database

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Database Specification: Purpose, Business Problems, Business Rules

Database Purpose:

The purpose of the database is to centralize the banking experience for the end-users where they can get a consolidated view of their different accounts and the subscribed banking products from different banks.

Business Problems Address:

1. Our team aims to develop a centralized relational banking database system that enables customers to access all their bank accounts and financial information from a single platform

2. The database will enhance the user experience by providing easy access to account details, compliance updates, and banking product offerings from various banks

3. It will also evaluate, and process account balance based on transaction history and make data available based on access privileges

4. This system will empower users to manage their subscription to financial products, monitor spending, compare new products and make informed investment decisions using data-driven insights and financial strategies

Business Rules:

1. Customer Management: Each customer can have multiple bank accounts across different banks, but each account is associated with only one customer.
2. Beneficiary Relationship: A customer can have multiple beneficiaries linked to their various accounts.
3. Banking System: Each bank can offer multiple products in categories such as loans, bank cards, investments, current accounts, and savings accounts.
4. Products: Each product can be subscribed to by multiple customers, and a customer can subscribe to multiple products.
5. Transactions: Customers make transactions tied to specific bank accounts and beneficiaries. Each transaction records details such as transaction ID, customer account number, beneficiary ID, transaction date, transaction type, transferred amount, remaining balance, and a description provided by the customer.
6. Compliance and Regulation: Banks are regulated by the federal government, which enforces regulations and assigns compliance roles.

Design Decisions:

Sr. No	Entity Name	Reason	Relationship to other entities
1	Federal_Govt	This entity will work like a governing body, which keeps track of all the banks that have been established till date. This entity has attributes like the federal government ID for a particular government era.	This entity has access to bank entity and works with the bank to provide information about the creation of a bank in a particular government era.
2	Bank	Bank plays a central role in our Database since it provides information about different banking products which are opted by customers. The total number of users subscribed for a product can be estimated by the bank. The total number of transactions happening through a bank can be estimated. Bank includes the bank name, bank ID, linkage to federal government ID under which it was created and type of bank.	As one of the core entities in the database, it connects with all the product entities like Federal Govt, Customer, Loan Products, Savings Account, Current Account, Investment Option and Card, through various associative entities to remove many-to-many relationships.
3	Customer	A customer is an end-user who uses the platform and utilizes products and services provided by the bank. A customer entity will include all the customer details such as first name, last name, customer ID, email, Address, and contact number, etc.	The customer will use the services/ products provided by the various banks. Customer is linked to Bank, Loan Products, Savings Account, Current Account, Card, Investment Option and Beneficiary entities through various associative entities to remove many-to-many relationships. Customer is connected to Security Log which keeps track of logging of each customer in the system.
4	Current_Account	Represents different current accounts offered by banks, with details such as Current Account ID given by bank, description of account, and corresponding interest rate. The entity provided different types of accounts for each customer needs.	Linked to Customer and Bank through associative entities. It is also linked to Current Transaction History to keep track of each transaction made by the customer using the account. Multiple banks

			offer multiple types of current account offerings.
5	Loan_Products	Represents loan types offered by banks, including attributes like loan ID, type and interest rate. The entity provides the customer with multiple loan products as per their requirements.	Linked to Bank and Customer through associative entities. Multiple customers can have multiple loans as per their requirements. Multiple banks offer multiple types of loan products.
6	Investment_Options	This entity provides a user with all the investment options at hand with the details like Investment name, description, and amount.	Linked to Bank and Customer entity through associative entities. Multiple customers can have multiple investment schemes as per their requirements. Multiple banks offer multiple types of investment options.
7	Card	This entity holds all the card information provided by all banks that is crucial for a customer. Stores card-related data such as type (debit/credit/forex) and expiration date.	Linked to Bank and Customer entity through associative entities. Multiple customers can have multiple cards as per their requirements. Multiple banks offer multiple types of cards.
8	Savings_Account	Represents different savings accounts offered by banks, with details such as Savings Account ID given by bank, description of account, and corresponding interest rate. The entity provided different types of accounts for each customer needs.	Linked to Customer and Bank through associative entities. It is also linked to Savings Transaction History to keep track of each transaction made by the customer using the account. Multiple banks offer multiple types of savings account offerings.
9	Security_Log	Stores logs of customer activities, such as login attempts and password changes, for security auditing. This is a logger that holds all the related data related to customer actions like login timestamp, activity type, device info, and the IP address. This serves as a strong security layer for the database.	It is related to the customer entity by many to one and holds the log data that can be accessed for tracking and auditing security-related actions.
10	Bank_Customer	This is an associative entity to remove many-to-many relationship between bank and customer. This	It is linked to Bank and Customer. A customers can be registered with multiple

		entity serves as a record for each bank to know its number of customers.	banks. A single bank can have multiple customers.
11	Bank_Current_Account	Represents the relationship (associative entity) between banks and current accounts they offer. It holds Bank ID and type of current account ID it provides along with the product's start and end dates.	Linked to Bank and Current Account entity for managing current account offerings.
12	Bank_Loan_Products	Represents the relationship (associative entity) between banks and loan products they provide. It holds Bank ID and type of loan product it provides along with the product's start and end dates.	Linked to Bank and Loan Product entity for managing current account offerings.
13	Bank_Investment_Option	Represents the relationship (associative entity) between banks and investment options they provide. It holds Bank ID and type of investment it provides along with the product's start and end dates.	Linked to Bank and Investment Option entity for managing investment offerings.
14	Bank_Card	Represents the relationship (associative entity) between banks and cards they offer. It holds Bank ID and type of card it provides along with the product's start and end dates.	Linked to Bank and Card entity for managing card offerings.
15	Bank_Savings_Account	Represents the relationship (associative entity) between banks and savings accounts they offer. It holds Bank ID and type of savings account ID it provides along with the product's start and end dates.	Linked to Bank and Savings Account entity for managing savings account offerings.
16	Customer_Current_Account	Represents the relationship (associative entity) between Customer and current accounts they subscribe. It holds Customer ID and type of current account ID along with the Current Account Number.	Linked to Customer and Current Account entity for managing the Current account.
17	Customer_Loan	Represents the relationship (associative entity) between customer and loan products they subscribe. It holds Customer, type of loan product, loan account	Linked to Customer and Loan Product entity for managing loan product subscription.

		number along with Loan status. It provides information of subscription of loan products by each customer.	
18	Customer_Investment	Represents the relationship (associative entity) between customer and investment product offerings by bank. It holds Customer ID, type of investment, Demat account number and demat account ID. It provides information of subscription of investment product by each customer.	Linked to Customer and Investment Option entity for managing investment offerings.
19	Customer_Cards	Represents the relationship (associative entity) between customer and card offerings by bank. It holds Customer ID, Card ID, Card Number, Card Status and Card status. It provides information of card subscription by each customer.	Linked to Customer and Card entity for managing card offerings.
20	Customer_Savings_Account	Represents the relationship (associative entity) between Customer and savings accounts they subscribe. It holds Customer ID and type of savings account ID along with the savings Account Number.	Linked to Customer and Savings Account entity for managing the Savings account.
21	Beneficiary	Represents individuals or entities who are set up by customers to receive payments from specific accounts. It holds records like the customer ID, beneficiary's ID and name and beneficiary account number.	Each customer can have multiple beneficiaries for their accounts, allowing money transfer feature. This allows for easy money transfer without having to add all the details all over again when doing a transfer.
22	Current_Transaction_History	Whenever a user makes a transaction through their current account, a record of this transaction is maintained in the current transaction history. This entity has a record of the transaction type, beneficiary ID, Current account number, date of the transaction, its description, and the balance after the transaction.	Whenever a customer wants to see where money was spent, he/she will access the transaction history to get a detailed idea of when the transaction was made and the amount transferred into beneficiary account. The entity is connected to Customer_Current_Account and Beneficiary entity.

23	Savings_Transaction_History	Whenever a user makes a transaction through their savings account, a record of this transaction is maintained in the savings transaction history. This entity has a record of the transaction type, beneficiary ID, Savings account number, date of the transaction, its description, and the balance after the transaction.	Whenever a customer wants to see where money was spent, he/she will access the transaction history to get a detailed idea of when the transaction was made and the amount transferred into beneficiary account. The entity is connected to Customer_Savings_Account and Beneficiary entity.

ERD Diagram Link:- https://lucid.app/lucidspark/495d6c42-eae9-443c-9a43-37416230e53a/edit?viewport_loc=-2685%2C-57%2C3033%2C1432%2C0_0&invitationId=inv_2fcc0366-1324-4ac5-aaf6-f41737d59596