

## Micro Banking System

B is a small private bank in Sri Lanka. They are trying to attract new customers by providing micro banking facilities. Managers are planning to do PoC for the system. The system essentially has two components; the central server with the central database and mobile banking device that agents take to from customer to customer.

The mobile devices contain only lightweight databases and can only handle deposit and withdraw functionalities. To make the transactions efficient and less costly, mobile devices update the central server only after a particular number of transactions, as a batch processing or after a certain time period depending on which comes first. An account holder is only allowed to withdraw money from one mobile banking agent to avoid withdrawing money more than he actually has deposited. However any account holder can make a special request and get the facility to withdraw money from any mobile agent with an additional service cost per each transaction. These types of withdrawal transactions are called critical transactions and they immediately update the central server. These mobile agents provide service to joint account holders as well and those accounts are given the multiple agent withdrawal facility by default.

All the interest calculating processes are handled only by the central server. Interest rates and minimum required balance for Savings accounts vary on the plan. Plans are briefly listed below,

- Children - 12%, no minimum
- Teen - 11%, 500 minimum
- Adult (18+) - 10%, 1000 minimum
- Senior (60+) - 13%, 1000 minimum
- Joint - 7%, 5000 minimum

Apart from these, customers could start a Fixed Deposit (FD) with the bank by going to their main station. For an FD to function, a customer must have a Savings account. The FD plans are as follows,

- 6 months, 13%
- 1 year, 14%
- 3 years, 15%

**All rates are provided per annum.** FD would calculate the monthly interest and deposit it in the linked Savings account. Months are calculated as 30 day periods starting from the FD opening date.

Apart from these requirements, the bank needs to see some basic monthly reports from the system. Some of the reports include,

1. Agent wise total transaction report
  2. Account wise total transaction report
- Only bank management can view these reports.

## **Task**

Your task is to model the database design to encapsulate these requirements. It should consider all entities and relationships given in the description. Moreover, you need to identify the places where procedures, functions, and triggers can be employed to guarantee ACID properties. Foreign keys and primary keys must be set to maintain consistency. Indexing should be done when necessary.

Additionally, you must get a domain idea by reading related material and take assumptions when not explicitly provided. (Ex: Account types, interest rates etc.) The database must be populated with dummy data before presentation. There is no need to implement UI control to specifically input data. SQL queries can be used to manually input the dummy data.