

Bank Transaction And Loan Processing System

A is a small, high secure, private bank in Seychelles. For various reasons their banking system has been maintained in by an old DOS system for the past few decades. With recent regulations introduced by Seychelles finance authorities, A needs to allow the bank system access to the country's common banking switch which enables a series of services including cross bank transfers and open ATM usage. To comply with this, the management of A has decided to hire a team of experts to design a Core banking solution. As the first stage, the solution would include bank branch management, internal fund transfers and loan processing features.

Your team is contracted with designing the solution for the first phase. Since database is the most critical component in a banking system, the management is concerned about the it. As a PoC, it is required to design the database solution for the task at hand. To verify consistency and do offline testing on validity, you are required to implement a minimal UI that would expose the database features to the QA testers. The requirement of the initial phase system is as follows.

The bank contains a series of branches. The head office is also considered as a branch. Each branch has a branch manager and set of employees. These employees need access to the Core Banking System (CBS). A leased line network already exists for connectivity of each branch to the head office where the servers are situated. Customers can open new accounts by visiting any of the branches. Accounts are affiliated to a branch but the customer are free to choose different branches per account. Customer can be either individuals or organizations. (NGO, Company etc.) Bank offers two kinds of accounts, Savings and Checking. Savings account offer a high interest rate but allows only 5 withdrawal per month. Interest rates and minimum required balance for Savings account 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

Current accounts on the other hand provides no interest rate but does not constrict the number of withdrawals per month. Apart from these, customer could start a Fixed Deposit (FD) with the bank. For a 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. Customer can withdraw money from ATMs or simply use the online portal to transfer funds with each other. But only **same bank transfers** are allowed in this phase of the system. No transaction fee is taken for online transfers. Further, customers can apply for loans; Business or Personal. One way to apply loans is to reach the closest branch and take

assistance of an employee there. Employee could login to the system and create a new loan request. (The standard loan application fields need to filled) Once the loan application is created, it requires the approval of the branch manager before being confirmed. A also has planned a special **online loan system** where a customer could self-apply a loan from the online portal. For this, customer need to have an existing FD. Then customer could apply to a loan amount of upto 60% of the original FD amount, with an upper bound of 500,000. Online loans are instant and doesn't require the approval of a manager. If all conditions are set, the requested loan amount will be deposited to the Savings account bound to the FD. When either type of loans are approved (for online loans just applied), a loan installment set should be calculated. Loan installments are calculated by taking the original loan amount, adding the interest rate over the settlement period and dividing by the months to get monthly amount. These installments would be marked paid when customers pay them in time. Apart from these requirements, the bank need to see some basic reports from the system. Some of the reports include,

- 1.Branch wise total transaction report
 - 2.Branch wise late loan installment report
- Only branch managers can view these reports.

Task

Your task is to model the database design to encapsulate these requirement. 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, the you must get a domain idea by reading related material and take assumptions when not explicitly provided. (Ex: Account types, interest rates, loan rate 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.