

SFWR ENG 3KO4 / 3MO4

Software Development for Computer/Electrical Engineering

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*Software Requirement Specification (SRS)
for the Automated Banking Machine
(ABM system)*

ABM System Overview

- The software to be designed will control a simulated automated banking machine (ABM) having a magnetic stripe reader for reading an ABM card, a customer console (keyboard and display) for interaction with the customer, a slot for depositing envelopes, a dispenser for cash, a printer for printing customer receipts, and a key-operated switch to allow an operator to start or stop the machine. The ABM will communicate with the bank's computer over an appropriate communication link. (The software for the hardware and communication interface is not part of the requirements for this project.)
- The stakeholders are the **customers**, the **bank**, and the **system operator**.

Customer Related Requirements

- The ABM will serve one customer at a time.
- A customer will be required to insert an ABM card and enter a personal identification number (PIN) - both of which will be sent to the bank for validation as part of each transaction.
- Once validated the customer shall be able to perform one of the following transactions:
 - A customer shall be able to make a cash withdrawal from any suitable account linked to the card, in multiples of \$20.00.

Customer Related Requirements *Cont'd...*

- A customer shall be able to make a deposit to any account linked to the card, consisting of cash and/or checks in an envelope. The customer will enter the amount of the deposit into the ABM, subject to manual verification when the envelope is removed from the machine by an operator.
- A customer shall be able transfer money between accounts linked to the card.
- A customer shall be able to pay bills to a list of pre-specified payees.
- A customer shall be able to inquire about the balance of any account linked to the card.
- A customer must be able to abort a transaction in progress by pressing the Cancel key instead of responding to a request from the machine.

Operator Related Requirements

- The ABM will have a key-operated switch that will allow an operator to start and stop the servicing of customers.
- After turning the switch to the "on" position, the operator will be required to verify and enter the total cash in stock.
- The machine can only be turned off when it is not servicing a customer.
- When the switch is moved to the "off" position, the machine will shut down, so that the operator may remove deposited envelopes and reload the machine with cash, blank receipts, etc.

Bank Related Information

- MacBank has a central database which consists of the following fields:
 - **Card number:** 8 numeric-digits.
 - **Pin number:** 4 numeric-digits. (PIN issued initially by the BANK and any teller should be logged from his/her PC to change it, i.e., PIN change is not part of ABM requirements)
 - **Incorrect tries:** the number of times the PIN was not entered correctly in the past 24 Hours is 3.
 - **Card status flag:** can be 0 for “card disabled” or 1 for “card active”.
 - List of accounts linked to the card:
 - Account number: 12 numeric-digits.
 - Account identifier: Chequing: 0, Savings: 1, Credit Card: 2.
 - Account Balance: Regular Balance plus any amounts that are still on hold.

Bank Related Information Cont'd ...

- In the event the Personal Identification Number (PIN) was entered incorrectly 3 times within a period of 24 hours, the bank system will flag the card as “*disabled*” and the client will have to contact MacBank personally.
- All money deposits are subject to manual verification.
 - Any amount deposited in cash, will be added to the appropriate account immediately.
 - Amounts deposited in cheques will be on hold for three days. At the end of that period the bank shall either receive a confirmation regarding the cheque validity, or it shall inform the client that the cheque has been returned, and the cheque amount will not be debited to the client’s account.
 - MacBank Information Technology system is responsible for monitoring the hold amounts, hold times and updating the central database accordingly.

Bank Related Information cont'd...

- Any withdrawal or transfer, from any given account, shall not exceed the balance available on that specific account. MacBank **does not allow** overdrafts.
- All clients have a maximum of \$500 withdrawal limit for any given 24hr period.
- A new day starts exactly at 00:00am.
- MacBank does not communicate with any other banks and serves only MacBank clients.
- PIN authentication is **always** required. (There is no such thing as - card with a blank PIN number)

ABM Specifications

- Every interaction with the ABM will start with the customer sliding his/her card on the magnetic stripe reader.
- The ABM will communicate each transaction to the bank and obtain verification that it was allowed by the bank.
 - A transaction will be considered complete by the bank once it has been approved.
 - In the case of a deposit, a second message will be sent to the bank indicating that the customer has deposited the envelope. (If the customer fails to deposit the envelope within the timeout period, or presses cancel instead, no second message will be sent to the bank and the deposit will not be credited to the customer.)

ABM Specifications cont'd...

- If a transaction fails for any reason other than an invalid PIN, the ABM will display an explanation of the problem, and will then ask the customer whether he/she wants to do another transaction.
- The ABM will provide the customer with a printed receipt for each successful transaction, showing the date, time, type of transaction, account(s), amount, and ending and available balance(s) of the affected account ("to" account for transfers).
- Minimum money in the ABM is \$10,000 before it flags the operator
- There is no limitation for maximum amount of money in the ABM.

ABM Specifications cont'd...

- If the ABM fails to contact the central database within 30 seconds, an appropriate message should be displayed to the customer and the current operation shall be cancelled.
- If the customer has been inactive for 30 seconds the entire session shall be terminated.
- The ABM can be stocked with only \$20 dollar bills. When restocking the machine, the operator has to indicate how many \$20 bills have been stocked.

ABM Specifications cont'd...

- ABM will accept any denomination for a deposit, but it will not accept any coins.
- No history of transactions are displayed or printed (only the balance of the current account)
- The ABM has **NO** fake bill detector and it **CANNOT** exchange foreign currency.
- Machine never has zero money

ABM System

