Software Requirements Specification

for

ATM Simulator

Version 1.0 approved

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1 Introduction

1.1 Purpose

An ATM is a specialized computer that makes it convenient to manage a bank account holder's funds.
ATM Simulation System will enable important features of an ATM such as reduction of human error in the banking system and the possibility of 24 hour personal banking without human aid as well as banking in remote areas.

1.2 Intended Audience

This product is intended for an audience of all age groups that have bank accounts. This product aims to make their bank interactions easier for the common man.

1.3 Product Scope

This document applies to the Automated Teller Machine software ATM version1.0. This software facilitates the user to perform various transactions in his account without going to the bank. This software offers benefits such as cash withdrawals, balance transfers, deposits, inquiries, credit card advances, and other banking-related operations for customers. It also allows the administrator to fix the tariffs and rules as and when required. The software takes as input the login Id and the bank account number of the user for login purposes. The outputs then comprise an interactive display that lets the user select the desired function that he wants to perform.

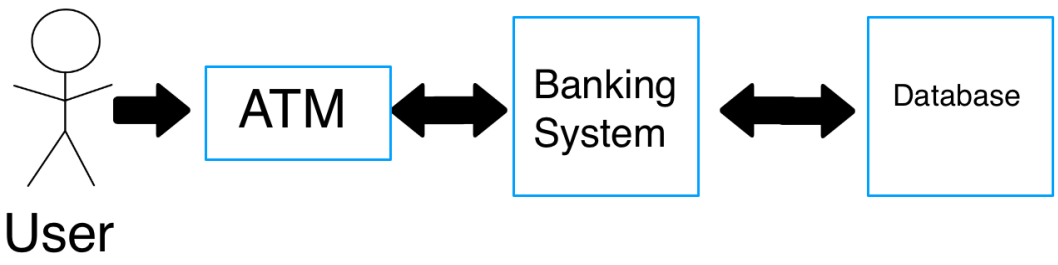
References

The References used for this SRS document are

- www.google.com
- www.wikipedia.com
- IEEE. Software Requirements Specification Std. 830-1993.

Overall Description

Product Perspective



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- The ATM is a single functional unit consisting of various sub-components

- This software allows the user to access various banking-related services automatically without human intervention
- The software allows various functions including cash withdrawal, account activation, pin setup, and Balance check
- The need for this software is to be installed on new ATMs that will be installed by many public and private banks to provide customer satisfaction and ease of accessibility to perform necessary bank-related activities with convenience
- The ATM software will let the user access the banking system of the user's particular bank, which accesses, configures, and updates this data in the bank's interconnected database
- In case a blacklisted ATM card is used, the ATM will inform the bank about the time and location of the incident while displaying a decoy error message on ATM screen
- In addition, to ensure the smooth functioning of the ATM, an operator will be assigned to the ATM to perform routine tasks like:
    - Load Money when ATM is low on cash
    - Make sure Backup power is functioning as intended
    - Ensure good ventilation for the user
    - Maintain good working environment for physical components of ATM
    - Perform frequent security updates
    - Check the functioning of alarm system in case of a forced entry

Product Functions

The major functions include:

- Check account balance
- Withdraw cash
- Resetting pin or setting new pin
- Printing monthly statements
- Transfer money
- Trigger alarm

User Classes and Characteristics

- Customers - General public, with no special expertise;highest frequency of use;basic privileges;varying educational level
- Bank security personnel - Bank personnel with little training and no technical expertise;low frequency of use;extra privileges;well educated
- Maintainers and operators - People tasked to ensure smooth functioning;routine/scheduled use;highest privileges;highly trained in technical functioning of the machine;long-term experience with security systems

Operating Environment

- The software should be up and running 24/7
- The software will run on a well tested and highly secure ATM
- The operating system for the software will be customized

- Continuous power supply and power backup
- Ability to register input,detect real currencies,communicate with bank's network
- Prompt error message when wrong pin entered or blacklisted card used

Design and Implementation Constraints

- The operator is highly trained and available when the system fails
- Continuous power supply and backup power depend on the bank deploying the ATM machine
- Contacting the emergency services in the time of theft depends on the availability of service

2.6 Assumptions and Dependencies

- Hardware is foolproof, intact and can never fail
- Correct working of alarm systems
- ATM is always connected reliably to the banking system
- Cash in the ATM is routinely refilled
- Good ventilation and optimal temperature for ATM machine

External Interface Requirements

User Interfaces

The user is met with an extremely user-friendly GUI to handle different requirements. A menu-driven program is drawn up that allows the user to choose their desired service.

1) A login page is provided into which id and password may be entered. If credentials match up, the login is successful. If incorrect, a prompt to re-enter credentials are shown.
2) If the user credentials match up to a customer, a list of services is provided. These services are:
    - Check account balance
    - Withdraw cash
    - Resetting pin or setting new pin
    - Printing monthly statements
    - Transfer money
3) Once an option is picked, the customer is prompted to enter card and pin (except while setting a new pin). If the card or pin entered is incorrect, then it is marked as unsuccessful. After 3 unsuccessful tries, the card is blocked from all services for 24 hours
4) If successful, based upon the service chosen, the customer is given prompts
5) For checking the account balance, the balance is displayed as soon as the card and pin match
6) For withdrawal of cash, the customer is asked to enter the amount they wish to withdraw and denominations they wish to collect it in. If the number of notes required is available, the cash is ejected out.

If the notes are unavailable, display an error message and eject cash out in denominations that are present in the machine.
If there is a lack of cash in the machine, an error message will be displayed and the user will be prompted to re-enter a new amount

7) For resetting a pin or setting a new pin, the customer is asked to enter their registered mobile number upon which an OTP verification is prompted. If successful the new pin is entered and re-entered.
8) For transferring money, customer is prompted to enter bank account details of the account to transfer money into along with the amount of money to be transferred
9) For printing monthly statements, the customer is asked to choose the month and a copy of their transactions for the entered month is printed.
10) During the execution of all services if a customer takes more than a certain amount of time to enter details into the prompt after entering card and pin, the service times out. The customer is then asked to choose an option from the menu bar again and re-enter their card and pin.
11) If the user credentials match up to an administrator or technician, a list of services is provided. These services are:
    - Check diagnostics
    - Refill cash

Software Interfaces

In order to perform various different functions, this software needs to interact with various other softwares. So there are certain software interface requirements that need to be fulfilled which are listed as follows:

1) The database used to keep track of users and their records is SQL

2) Tracking transactions between the user and atm is recorded and held in SQL
3) GUI using python3

Communications Interfaces

The following are the various communication interface requirements that must be met in order for the software to work properly on the computer since it must communicate with the main branch for each session to provide activities like login verification and account access.

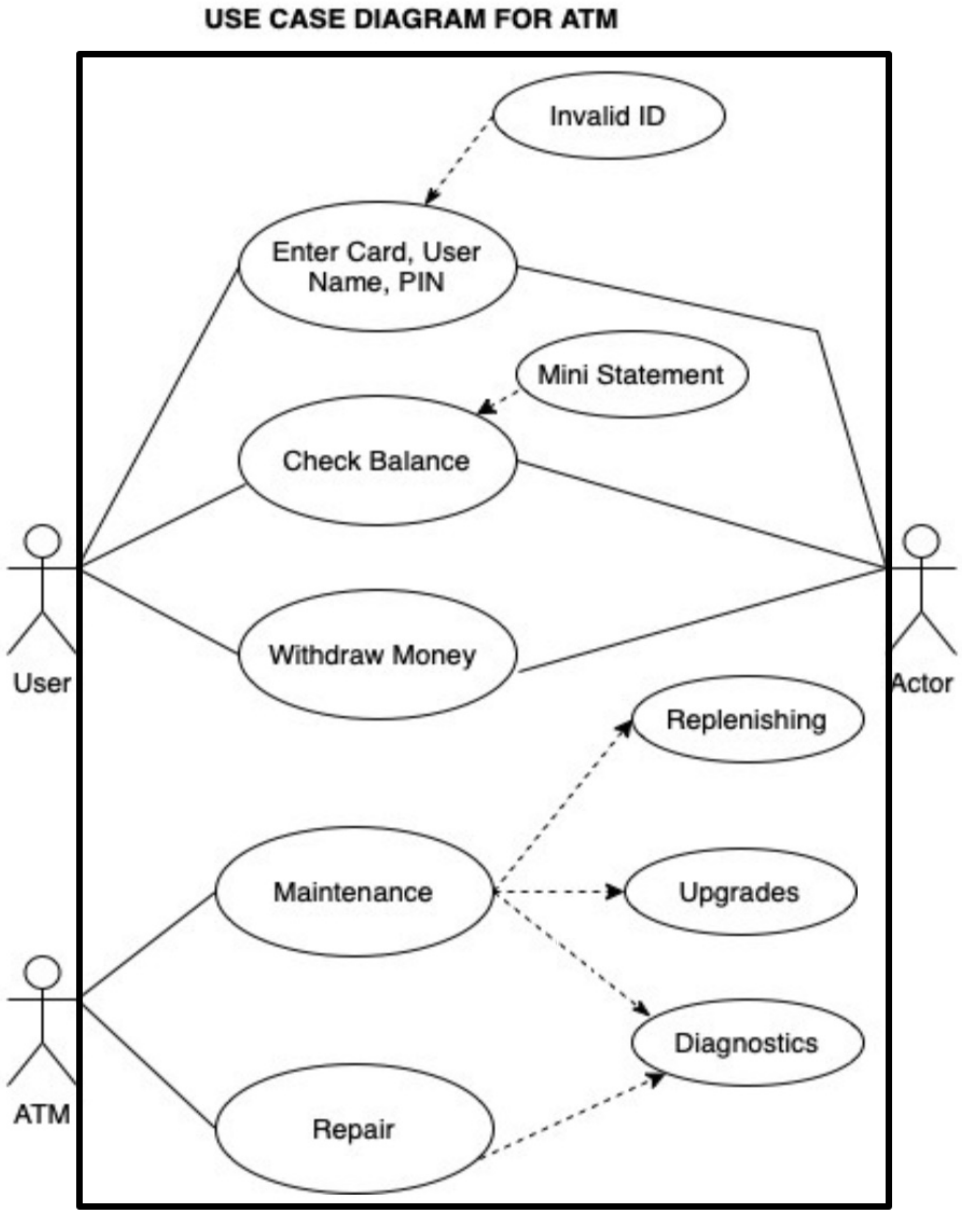
- The system will use dial-up POS to connect to the main server for cheap connectivity.
- The communication protocol used shall be TCP/IP.

Analysis Models

This is a Use-Case diagram depicting the functionalities of the System

USE CASE DIAGRAM FOR CUSTOMER AUTHENTICATION

System Features



FEATURE 1: REMOTE BANKING AND ACCOUNT HANDLING

Description:

One of the major features and reasons for the concept of an ATM is remote banking and account handling. This means that banking can be done at any convenient place without any aid of a human bank teller and so can managing an existing bank account.

Stimulus/Response Sequences:

As a stimulation we check all the functionalities of remote banking such as withdrawing the entered amount, checking the balance, changing the pin, and so on.

If the ATM system fulfills all the stimulating actions and responses as expected by the system, it is considered the tests are successful.

Functional Requirements:

REQ-1 : Check account balance

REQ-2 : Process a deposit

REQ-3 : Process a withdrawal for an ATM customer or a

REQ-4 : Process a cash advance for a credit card holder

REQ-5 : Transfer funds

REQ-6 : Pay bills

FEATURE 2: CHECKING FOR VALIDITY AND SECURITY

Description:

Also if the user is an administrator, he is required to enter his login id to access and change the facilities provided by the system.

To access or proceed with utilizing the system, the user is required to enter his/her correct user id and pin no, and account number. After a fixed number of logins if the login has failed the backend gets notified of unusual behavior. The unusual behavior can be anything such as withdrawal of sudden high amounts and so on. The card gets blocked or blacklisted accordingly.

The user can access only one account at a time and can enter only one account no.

Also, if the user is an administrator, he is required to enter his login id in order to access and change the facilities provided by the system.

Stimulus/Response Sequences:

The stimulus is trying to log in to the account through the ATM by entering the user id, pin no., and account number. The response must be accepting the login if the above three entries are correct and match with those in the database and rejected if either of the above is incorrect.

Functional Requirements:

REQ-1 : Data Validation: Any incorrect data must not be validated.

REQ-2 : Fraud Detection: Any detected incorrect attempt must be reported back to the backend.

REQ-3 : Any non-numerical pins must be rejected.

REQ-4 : Every pin must satisfy the condition of six digits else must be rejected.

REQ-5 : Account numbers must always be numeric only.

REQ-6 : User pin details must be encrypted.

FEATURE 3: ERROR HANDLING AND HELP

Description:

If any of the above validation/sequencing flow does not hold true, appropriate

error messages will be prompted to the user for doing the needful

If any of the above validation/sequencing flow does not hold true, appropriate error messages will be prompted to the user for doing the needful.

A help button is available and if accessed directs the user to the procedure of using the ATM system.

Stimulus/Response Sequences:

Any action such as entering the wrong pin, expired credit/debit card, incorrect user id, validated for stolen or lost, use of a blacklisted card, etc- will be responded with an appropriate error message such as “wrong pin please try again”, “your credit/debit card has been expired” respectively and so on.

The error button when accessed plays a video in response to help the user in understanding the system usage.

Functional Requirements:

REQ-1 : Error messages for various situations must be stored in the database priorly.

REQ-2 : System must be able to separate error types to give out the correct error messages.

REQ-3 : The help video must be loaded into the system.

FEATURE 4: USER-FRIENDLY INTERFACE

Description:

An ATM system has a very accessible interface that has both touches as well as keypad access. Language preference can be selected as well based on the user’s comfort. They have several pages such as the welcome page, a login page, a page with options of all the tasks that can be performed, and so on.

Stimulus/Response Sequences:

More and more users find ATMs accessible as the user interface gets more convenient and user-friendly to use.

Functional Requirements :

REQ-1 : Design an interface that is accessible by all age groups

Other Nonfunctional Requirements

Performance Requirements:

DYNAMIC REQUIREMENTS:

- The card verification must not exceed 1.5 seconds under normal server load and should not exceed 3 seconds under high server load
- The card verification must not exceed 1.5 seconds under normal server load and should not exceed 3 seconds under high server load
- Account balance display time must not exceed 5 seconds under normal server load and should not exceed 7 seconds under high server load
- Transaction time should not exceed 10 seconds under normal server load and should not exceed 20 seconds under high server load
- Withdrawal time should not exceed 10 seconds under normal server load and should not exceed 20 seconds under high server load
- Receipt printing time should not exceed 3 seconds under normal server load and should not exceed 5 seconds under high server load

Safety Requirements

- When there is an underflow of cash in the ATM and the user asks for an amount that exceeds the amount present in the ATM at that instance we display an error message which then sends information to the bank
- The customer credentials must be encrypted in the database; this is done to ensure the customers safety.

Security Requirements

- The pin is encrypted while entering it as the PIN serves as a secondary form of verification.
- Always block the view of the ATM keypad(keyboard) with your hand while entering the PIN
- User should be provided with only three attempts for login after which their card will be locked for 24 hours

Software Quality Attributes

QUALITY:

The guidelines used to judge the quality of the software:
Test cases: to check the functionality
Consistency: all code will adhere to a standard

RELIABILITY:

- The memory system is nonvolatile
- The system can easily integrate with a bank system
- The system will be down for 30 min in each 24-hour cycle

AVAILABILITY:

- Easy to troubleshoot in the case of system failure
- The system will have a backup power supply in the case of power failures

MAINTAINABILITY:

- The system should have the mechanism of self-monitoring periodically to detect faults
- When the system encounters an error it should immediately send a message to the bank

Business Rules

The following are the business rules for the software:

- The Administrator has the power to amend the laws and to establish or change the policies as needed. The bank's employees carry out the following tasks.

- The Bank authorities performs the following:
    - Making entries in the system concerning every aspect of the user's bank account.
    - Maintaining the user's bank account updated as soon as changes are made to ensure that the data is in a consistent form.
    - Blocking or taking control of the user's account when any illegal transaction is found.
    - Blocking of an ATM card that has been reported as lost or stolen will only occur if the user can provide proof of the incident and a copy of the FIR.