Software Requirements Specification document

For

ATM Machine

Version 1.0 approved

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1. Introduction

An ATM (Automated Teller Machine) is a computerized telecommunications device that provides the customers of a financial institution an access to financial transactions in a public space without the need for a human clerk or bank teller. The product will provide personalized features and a user friendly interface. It will be a popular "Public Technology". Original equipment manufacturers and vendors will get ample scope for handling ATM Machines. Modern ATM's will be capable of personalized branding, CRM application, customer notifications and flexible services. ATMs will memorize consumer preferences as per their past transactions, behavior, and tailor services accordingly. In many cases, ATMs will have internet scope which will facilitate the two way communications with live agents, will provide biometric options, and will have the ability to demonstrate personalized advertisements.

1.1 Purpose

The releasing date of the product will be November 10, 2020. This document is intended for the reading of developers, stake holders, primary and secondary users, project manager, marketing staff, testers at each stage and the documentation writers. This document describes the software requirements and specification (SRS) for an ATM machine. The user is intended to have a basic knowledge of banking accounts and account services. The document also defines the external interface, performance and software system attributes requirements of ATM machine.

1.2 Intended Audience and Reading Suggestions

The intended audience of this SRS consists of:

- *Software designers*
- *Systems engineers*
- *Software developers*
- *Software testers*
- *Customers*

1.3 Product Scope

This software will facilitate the user to perform various transactions in his account without going to bank. The software will offer the benefits such as cash withdrawal, balance transfer, deposits, inquiries, credit card advances and other banking related operations for customer. It will also allow the administration to fix the rules as and when they required. The ATM machine identifies the customer by the cash card and the password. The ATM machine takes login ID of customer as input and bank account number for login purposes. Then the display will let the user to perform the desirable function he wants to perform.

1.4 References

The references for the above software are as follows:-

i. www.google.co.in
ii. www.wikipedia.com

iii. *IEEE. Software Requirements Specification Std. 830-1993.*
iv. *Chevy Chase Bank, UMBC Branch.*
v. *Russell C. Bjork Requirements Statement for Example ATM System.*

2. Overall Description

2.1 Product Perspective

- *The ATM network doesn't work independently; it is a single functional unit consisting of various subcomponents.*
- *This software allows the user to access their bank accounts remotely through an ATM without any aid of human bank teller.*
- *This software will also allow performing various other functions apart from just accessing his bank account such as mobile bill clearings etc.*
- *Some of its hardware components are cassettes, memory, drives, dispensers i.e. for receipts and cash, a card reader, printer, switches, a console, a telephone dialer port, a networking port and disks.*
- *The ATM communicates with the bank's central server through a dial-up communication link. The Memory of the system shall be 25MB.*
- *The Cassette capacity shall be at least 2500 notes.*

2.2 Product Functions

The major functions that will be performed by this software (ATM Machine) are listed below:

- **Language Selection:-**
  After the user has logged in, the display will provide the user a list of languages from which he can select any one in order to interact with the machine throughout that session. After the language selection the user is prompted with an option that whether he wants the selected language to be fixed for future use so that he is not offered with the language selection menu in future thus making the transaction a bit faster. User also has the freedom to switch to a different language mentioned in the list in between that session.
- **Account Maintenance:-**
  The various functions that a user can perform with his account are as follows:-
  - **Account Type:-**
    The user has the freedom to select his account type to which all the transactions are made, i.e. he can select whether the account is current account or savings account etc.
  - **Withdrawal/Deposit:**
    The software allows the user to select the kind of operation to be performed i.e. whether he wants to withdraw or deposit the money.
  - **Amount:-**
    The amount to be withdrawn or deposited is then selected or entered by the user.
  - **Denominations:-**

The user is also provided with the facility to mention the required denominations. Once he enters his requirements the machine goes through its calculations on the basis of current resources to check whether it is possible or not. If yes, the amount is given to the user otherwise other possible alternatives are displayed.

- **Money Deposition:-**
  Money deposition shall be done with an envelope. After typing the amount to be deposited and verification of the same, the customer must insert the envelope in the depositary.

- **Balance Transfer:-**
  Balance transfer shall be facilitated between any two accounts linked to the card for example saving and checking account.

- **Balance Enquiry:-**
  Balance enquiry for any account linked to the card shall be facilitated.

Billing:-
Any transaction shall be recorded in the form of a receipt and the same would be dispensed to the customer. The billing procedures are handled by the billing module that enable user to choose whether he wants the printed statement of the transaction or just the updation in his account.

Cancelling:-
The customer shall abort a transaction with the press of a Cancel key.
For example: on entering a wrong depositing amount. In addition the user can also cancel the entire session by pressing the abort key and can start a fresh session all over again.

2.3 User Classes and Characteristics:

There are different kinds of users that will be interacting with the system. The intended users of the software are as follows:-

User A:
A novice ATM customer. This user has little or no experience with electronic means of account management and is not a frequent user of the product. User A will find the product easy to use due to simple explanatory screens for each ATM function. He is also assisted by an interactive teaching mechanism at every step of the transaction, both with the help of visual and audio help sessions.

User B:
An experienced customer. This user has used an ATM on several occasions before and does most of his account management through the ATM. There is only a little help session that too at the beginning of the session thus making the transaction procedure faster.

Maintenance Personnel:
A bank employee. This user is familiar with the functioning of the ATM. This user is in charge of storing cash into the ATM vault and repairing the ATM in case of malfunction. This user is presented with a different display when he logs in with the administrator's password and is provided with options different from that of normal user. He has the

authority to change or restrict various features provided by the software in situations of repairing.

2.4 Operating Environment

The ATM Machine is not an independent machine. It is a single functional unit consisting of various subcomponents. Hardware components included are: cassettes, memory, drives, dispensers i.e. for receipts and cash, a card reader, printer, switches, a console, a telephone dialer port, a networking port and disks.

2.5 Design and Implementation Constraints

The major constraints that the project has are as follows:-

- The ATM must service at most one person at a time.
- The number of invalid pin entries attempted must not exceed three. After three unsuccessful login attempts, the card is seized/blocked and need to be unlocked by the bank.
- The simultaneous access to an account through both, the ATM and the bank is not supported. The minimum amount of money a user can withdraw is Rs 100/- and the maximum amount of money a user can withdraw in a session is Rs.10,000/- and the maximum amount he can withdraw in a day is Rs 20,000/-
- Before the transaction is carried out, a check is performed by the machine to ensure that a minimum amount of Rs 1000/- is left in the user's account after the withdrawal failing which the withdrawal is denied.
- The minimum amount a user can deposit is Rs 100/- and the maximum amount he can deposit is Rs 10,000/-.
- A user can select only that cellular operator for mobile bill clearings that is supported by the bank. The software requires a minimum memory of 20GB
- There shall be a printer installed with the machine to provide the user with the printed statement of the transaction.
- For voice interactions, speakers should also be there to accompany the machine.

2.6 User Documentation

An animated video will be provided along the software so that the user may come to know how to use this. Through different advertisements the use of software will be told. Each bank will provide information about ATM machine along their user helplines.

2.7 Assumptions and Dependencies

The requirements stated in the SRS could be affected by the following factors:

- At this stage no quantitative measures are imposed on the software in terms of speed and memory although it is implied that all functions will be optimized with respect to speed and memory.
- One major dependency that the project might face is the changes that need to be incorporated with the changes in the bank policies regarding different services. As the policies changes the system needs to be updated immediately. A delay in doing

the same will result to tremendous loss to the bank. So this should be changed as and when required by the developer.

- Another constraint relating to the operating environment is that we are specific to Oracle Database. The project could be largely affected if some amount is withdrawn from the user's account from the bank at the same time when someone is accessing that account through the ATM machine. Such a condition shall be taken care of.

3. External Interface Requirements

3.1 User Interfaces

The interface provided to the user should be a very user-friendly one and it should provide an optional interactive help for each of the service listed. The interface provided is a menu driven one and the following screens will be provided:-

1. *A login screen is provided in the beginning for entering the required username/pin-no. and account number.*
2. *An unsuccessful login leads to a reattempt (maximum three) screen for again entering the same information. The successful login leads to a screen displaying a list of supported languages from which a user can select any one.*
3. *In case of administrator, a screen will be shown having options to reboot system, shut down system, block system, and disable any service.*
4. *In case of reboot/ shut down, a screen is displayed to confirm the user's will to reboot and also allow the user to take any backup if needed.*
5. *In case of blocking system, a screen is provided asking for the card no. By entering the card no of a particular user, system access can be blocked for him.*
6. *Administrator is also provided with a screen that enables him to block any service provided to the user by entering the name of the service or by selecting it from the list displayed.*
7. *After the login, a screen with a number of options is then shown to the user. It contains all the options along with their brief description to enable the user to understand their functioning and select the proper option.*
8. *A screen will be provided for user to check his account balance.*
9. *A screen will be provided that displays the location of all other ATMs of same bank elsewhere in the city.*
10. *A screen will be provided for the user to perform various transactions in his account.*

The following reports will be generated after each session dealt with in the machine:-

1. *The login time and logout time along with the user's pin no and account number is registered in the bank's database.*
2. *The ATM's branch ID through which the session is established is also noted down in the bank's database.*
3. *Various changes in the user's account after the transactions, if any, are reported in the database.*
4. *A printed statement is generated for the user displaying all the transactions he performed.*

3.2 Hardware Interfaces

There are various hardware components with which the machine is required to interact. Various hardware interface requirements that need to be fulfilled for successful functioning of the software are as follows:-

- Ability to read the ATM card
- Ability to count he currency notes
- Touch screen for convenience
- Keypad
- Continuous power supply
- Ability to connect to bank's network
- Ability to take input from the user
- Ability to validate the user

3.3 Software Interfaces

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

- *Different network software*
- *The ATM network has to provide software interfaces to the software used by different banks*

3.4 Communications Interfaces

Following are the various communication interface requirements that are needed to be fulfilled in order to run the software successfully:-

- The system will employ dial-up POS with the central server for low cost communication.
- The communication protocol used shall be TCP/IP.
- Protocol used for data transfer shall be File Transfer Protocol.(FTP)

4. System Features

4.1 System Feature 1

Remote Banking and Account Management:

4.1.1 Description:

The system is designed to provide the user with the facility of remote banking and perform various other functions at an interface without any aid of human bank teller. The functioning of the system shall be as follows:-

At the start, the user is provided with a log in screen and he is required to enter his PIN NO. and Account details which are then verified by the machine. In case of an unsuccessful attempt a user is asked again for his credentials but the maximum number of attempt given to the user is limited to 3 only, failing which his card is blocked and need to be unblocked by the bank for any future use.

After a successful log in, the user is presented with a list of language. The user can select anyone in the list for interaction with the machine for the entire session. After the language selection the user is also asked whether he wants to fix that language for future use also so that he is never asked for language in future. In addition there is also a facility for the user to switch to any other language during that session.

After the language selection, the user is directed towards a main page that displays a set of options/services along with their brief description, enabling the user to understand their functioning. The user can select any of the listed option and can continue with the transaction.

The machine also provides the user with a number of miscellaneous services such as: The machine lists a set of operators that are supported by the bank. A user can clear off his pending mobile phone bills be selecting his operator. The machine also has the facility to display a map that marks the location of other ATMs of the same bank in the city. This may help the user to look for the ATM nearest to his destination.

At any moment if the user wants to abort the transaction, he is provided with an option to cancel it. Just by pressing the abort button he can cancel all the changes made so far and can begin with a new transaction.

After the user is finished with his work, for security purpose, he is required to log out and then take his card out of the slot.

4.1.2 Validity Checks:

In order to gain access to the system, the user is required to enter his/her correct user id/pin no and account no failing which his card may be blocked. 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.

4.1.3 Sequencing Information:

The information about the users and their account should be entered into the database prior to any of the transactions and the backup be maintained for all account information

4.1.4 Functional requirement associated with this feature:

- Insert ATM card
- Validate ATM card
- Entering the product task
- Entering pin
- Validation of ATM card
- Asking for the amount of money to be withdrawn
- Amount will be debited if sufficient amount will be available in the account.
- Otherwise error message will be displayed

5. Other Nonfunctional Requirements

5.1 Performance Requirements

5.1.1 Capacity:

The ATM shall provide customers a 24 hour service.

5.1.2 Quality:

The primary objective is to produce quality software. As the quality of a piece of software is difficult to measure quantitatively, the following guidelines will be used when judging the quality of the software:

- Consistency – All code will be consistent with respect to the style. (This is implied when adhering to the standard).
- Test cases – All functionality will be thoroughly tested

5.2 Safety Requirements

- Must be kept in safe physical aspects
- Must be bolted to floor to prevent theft
- Must have an emergency phone just outside the cabin
- The cabin door must have an ATM card swipe slot

5.3 Security Requirements

- Users accessibility is censured in all the ways
- Users are advised to change their PIN on first use
- Users are advised not to tell their PIN to anyone
- The maximum number of attempts to enter PIN will be three.

5.4 Software Quality Attributes

5.4.1 Reliability:

- The data communication protocol shall be such that it ensures reliability and quality of data and voice transmission in a mobile environment.
- The memory system shall be of non-volatile type.

5.4.2 Availability:

- The product will have a backup power supply in case of power failures.
- Any abnormal operations shall result in the shutting down of the system.
- After abnormal shutdown of the ATM, the system shall have to be manually restarted by a maintenance personnel.
- There should be no inconsistency introduced in the account during whose transaction the system is abnormally shut down.

5.4.3 Security:

- The system shall be compatible with AIMS security standards.
- The system shall have two levels of security i.e. ATM card and pin verification both authenticated by the CMS software.
- The Encryption standard used during pin transmission shall be triple DES.
- The password shall be 6-14 characters long.
- Passwords shall not contain name of customers as they are easy to be hacked.
- Passwords can contain digit, hyphen and underscore.
- User should be provided with only three attempts for login failing which his card needs to be blocked.
- There shall be a security camera installed near the ATM.
- There shall be a secured cash vault with a combination locking system.
- The product cabinet cover shall be manufactured using Fiber glass for security purposes.

5.4.4 Maintainability:

- The system components i.e. modem, memory, disk, drives shall be easily serviceable without requiring access to the vault.
- The system should have the mechanism of self-monitoring periodically in order to detect any fault. The system should inform the main branch automatically as soon as it detects any error. The kind of fault and the problem being encountered should also be mentioned by the system automatically.

5.5 Business Rules

The business rules for the software are as follows:

- The Administrator has the authority to fix the rules and regulations and to set or update the policies as and when required.
- The staff at the bank performs the following:
    a. Making the entries in the system regarding all the details of the bank account of the user.
    b. Keeping the bank account of the user updated as soon as changes are encountered so that the data is in consistent state.
    c. Blocking or seizing of the account of user on discovery of any illegal transaction.
    d. Unblocking of ATM card that got blocked due to more than three unsuccessful login attempts.
    e. Blocking of a lost/stolen ATM card on complaint of the user, only if he presents his verification and a FIR filed for that case.
    f. Constantly monitor all the ATMs in the city to check whether any one of them is encountering any fault.
    g. Immediately correct any fault discovered in any of the ATM.
    h. Maintain the backup of all the accounts for reliability purposes.
    i. Rollback all the changes made in an account during whose transaction an ATM got abnormal shutdown.
- In case of loss of the ATM card. The user has to lodge a First Investigation Report (FIR) and present its one copy to bank officials for card blocking purposes.
- A log of the following annexure is generated by the system:
    i. User bank account details.
    ii. Updates made in the user account along with date, time and the changes made.

iii. Schedule of fixed assets.

6. Other Requirements

None

Appendix A: Glossary

AIMS	ATM Information Management System
Internet	*An interconnected system of networks that connects computers around the world via the TCP/IP protocol.*
Smart Card	*Card without hardware which stores the user's private keys within a tamper proof software guard.*
Tactile Keyboard	*Special keyboard designed to aid the visually impaired.*
TCP/IP	*Transmission Control Protocol/Internet Protocol.*