ATM - Automated Teller Machine

Problem Statement :

The ATM is an automated machine which performs banking tasks such as withdrawal of cash, cash transfer, checking balance, updating PIN and others. This system made a drastic change in the banking system by providing convenient withdrawal services from anywhere without having the hassle of visiting the bank and waiting in lines / queues.

Each ATM machine can serve only one person at a time, but the number of machines available to use around the globe is sufficient to reduce the inconvenience of visiting a bank.

The design of the software for the machine is done in a way to read / scan the ATM Card / Debit Card / Credit Card and validate them with the Bank server along with the PIN.

The validation & processing is done with the help of computer inside with a software to communicate with the Bank servers and interfacing hardware such as a magnetic reader for scanning ATM card, User Console (Keyboard, Display), a cash dispenser and a printer for printing statement/receipt.

The ATM System solves the issues ~~available~~ with the current banking system and provides a convenient and user friendly solution for the problems arised with the current banking system such as human work, time, easy access for old people/senior citizens.

The potential concerns using ATMs would be, the accessibility which can be improved by taking reviews and the possibility of attacking/hacking the machines which can be resolved by increasing & improvising the surveillance along with improvising the physical design of the machine as well as the software to ensure less potential damage and security.

Considering all the facts, we can say that the ATM system helps the customers in a very good way by providing different services in a more user friendly & time saving manner.

HOSPITAL MANAGEMENT SYSTEM

SOFTWARE REQUIREMENT SPECIFICATION

1. INTRODUCTION

The software is to be developed for Automated Teller Machines (ATM). An automated teller machine (ATM) is a computerized telecommunications device that provides a financial institution's customers a secure method of performing financial transactions, in a public space without the need for a human bank teller through the usage of user-friendly interface.

1.1. Purpose

This SRS defines External Interface, Performance and Software System Attributes requirements of the software. This document is intended for the following group of people:

- Developers for the purpose of maintenance and new releases of the software.
- Management of the bank.
- Documentation writers.
- Testers.

1.2. Scope

This software facilitates the user to perform various transaction in their account such as cash withdrawals, balance transfers, deposits, inquiries, credit card advances and other banking related operations without going to the bank. The software takes as input the Credit/Debit/ATM Card and the ATM Pin code for login purposes and outputs an interactive display that lets the user select the desirable function that they want to perform.

1.3. Definition, Acronyms, Abbreviations

- ATM – Automated Teller Machine
- SRS – Software Requirement Specification
- TCP/IP – Transmission Control Protocol/Internet Protocol

1.4. References

i. https://www.google.com
ii. https://www.wikipedia.com
iii. 830-1993 - IEEE Recommended Practice for Software Requirements Specifications

1.5. Overview

- Section 1.0 discusses the purpose and scope of the software.
- Section 2.0 describes the overall functionalities and constraints of the software and user characteristics.
- Section 3.0 details all the requirements needed to design the software.

2. OVERALL DESCRIPTION

2.1. Product perspectives

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

- This software allows the user to access their bank accounts remotely through an ATM without any aid of human bank teller.
- The ATM communicates with the bank's central server through a dial-up communication link.

2.2. Product Function

- **Language Selection**: After the user has logged in, the display provides him with a list of languages from which he can select any one in order to interact with the machine throughout that session.
- **Account Maintenance:** The various functions that a user can perform with his account are as follows:
    1. **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.
    2. **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.
    3. **Amount:** The amount to be withdrawn or deposited is then mentioned by the user.
    4. **Denominations:** Once the user enters their required denomination, 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.
    5. **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.
    6. **Balance Transfer:** Balance transfer shall be facilitated between any two accounts linked to the card for example saving and checking account.
    7. **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 updating 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 Characteristics

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

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 along with an interactive teaching mechanism at every step of the transaction, both with the help of visual and audio help sessions.

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.

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

2.4. 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 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 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 is Rs 10,000/-.
- 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.

2.5. Assumption and Dependencies

The requirements stated in the SRS could be affected by the following factors:
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 with the same immediately. A delay in doing the same will result to tremendous loss to the bank.
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.
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. It is furthermore assumed that the scope of the package will increase considerably in the future.

3. EXTERNAL INTERFACE REQUIREMENTS

3.1. User Interface

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. 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 anyone.
2. In case of administrator, a screen will be shown having options to reboot system, shut down system, block system, disable any service.
3. 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.
4. In case of blocking system, a screen is provided asking for the card no. By entering the card number of a particular user, system access can be blocked for him.
5. Administrator is also provided with a screen that enables him to block any service provided to the user by enter in the name of the service or by selecting it from the list displayed.
6. 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.

7. A screen will be provided for user to check his account balance.
8. A screen will be provided that displays the location of all other ATMs of same bank elsewhere in the city.
9. 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 Interface

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:

- The card reader shall be a magnetic stripe reader.
- The card reader shall have Smart card option.
- The slot for a card in the card reader may include an extra indentation for the embossed area of the card. In effect it acts as a polarization key and may be used to aid the correct insertion orientation of the card. This is an additional characteristic to the magnetic field sensor which operates off the magnetic stripe and is used to open a mechanical gate on devices such as ATMs. There shall be a 40-column dot matrix receipt printer.
- There shall be a 40-column dot matrix statement printer.

3.3. Software Interface

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

- The card management software used to verify pin no and login shall be CMS version 3.0.
- Yamaha codec 367/98 for active speakers.

3.4. Communication Interface

The machine needs to communicate with the main branch for each session for various functions such as login verification, account access etc. so the 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.

- 1. Remote Banking and Account Management
  Users can perform different transactions as well as make changes to their account from any ATM Machine.
  - 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.
- 2. Receipt Generation
  After each transaction user has performed, a receipt is generated that contains all the information about the transaction.

5. OTHER NON-FUNCTIONAL REQUIREMENTS

5.1 Performance Requirements

- **5.1.1 Capacity**
  The ATM shall provide customers a 24-hour service.

- **5.1.2 Dynamic requirements**
  - The card verification time must not exceed 0.8 sec. under normal server workload and 1 sec. under peak server workload.
  - The pin number verification time must not exceed 0.3 sec. under normal server workload and 0.5 sec. under peak server workload.
  - Account balance display time must not exceed 2 sec. under normal server workload and 3 sec. under peak server workload.

- **5.1.3 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.
  - **Test cases** -All functionality will be thoroughly tested.

5.2 Software System Attributes

- **5.2.1 Reliability**
  The data communication protocol shall be such that it ensures reliability and quality of data and voice transmission in a mobile environment.

- **5.2.2 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.

- **5.2.3 Security**
  - The system shall have two levels of security i.e., ATM card and pin verification both are authenticated.
  - The Encryption standard used during pin transmission shall be such that the password shall be 6-14 characters long, shall not contain name of customers as they are easy to be hacked, should contain digit, hyphen and underscore.
  - User should be provided with only three attempts for login failing which his card needs to be blocked.

5.2.4 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.

5.3 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:
  - Making the entries in the system regarding all the details of the bank account of the user.
  - Keeping the bank account of the user updated as soon as changes are encountered so that the data is in consistent state.
  - Blocking or seizing and unblocking of the account of user on discovery of any illegal transaction.

6. OTHER REQUIREMENTS

None

AUTOMATED TELLER MACHINE

SOFTWARE CONFIGURATION MANAGEMENT PLAN

In Software Engineering, Software Configuration Management is a process to systematically manage, organize, and control the changes in the documents, codes, and other entities during the Software Development Life Cycle. The primary goal is to increase productivity with minimal mistakes.

Change in Requirements:

Software change happens for different reasons, for example, in order to fix faults, to add new features, or to restructure the software to accommodate future changes. During product development and evolution, the set of requirements may be changed; where modifications to existing requirements or additions of new requirements may affect existing requirements. Some requirements changes may impact the success of the product within established schedules.

- Changes related to fixing faults and adding new features can be handled by the developer without any major changes to user experience.
- Changes involving major developments such as restructuring should be discussed well with all the business stakeholders and the office associates need to be educated about the changes in the interface.

Change in Team/Organization:

Changes in the team members gives rise to multiple inconveniences and conflicts.

- When new members are added into the team, they need to be educated about the whole project and its progress and they should catch up with the existing team members.
- When the team members are changed, the coordination between the team gets disturbed and may directly affect the work process.

Change in Government Policies & Rules:

Change in government policies such as terms and conditions related to data security, subsidies and tax related conditions may impact a software in various levels .
Once if the software is created it is difficult to implement changes into the system.
If there are any elements which violate the new government policies, it is essential to evaluate and modify those elements of the software.

Change in Project Schedule:

If there are any changes in the project schedule causing the schedule to be shortened, it will severely affect the development process and the work fashion of the team.
It will require the team to work faster and the reviews should also be organised in such a way that the product will be delivered on time.

Tasks in SCM Process:

1. **Configuration Identification**
   The purpose of configuration identification is to maintain control of an evolving system by Uniquely identifying the system, revisions of the system and the component parts of each revision and understanding the status of configuration items as they progress through the development process.

2. **Baseline**
   A baseline is a reference point in the software development life cycle marked by the completion and formal approval of a set of predefined work products. The objective of a baseline is to reduce a project's vulnerability to uncontrolled change by fixing and formally change controlling various configuration items at critical points in the development life cycle.

   The baselines are created based upon the progress of development of the configuration items as functional, preliminary design, detailed design, product and operational baselines

3. **Change Control**
   Change control is a procedural method which ensures quality and consistency when changes are made in the configuration object. Its purpose is to ensure that all changes to a complex system are performed with the knowledge and consent of management.

   Configuration control tasks include initiating, preparing, analysing, evaluating and authorising proposals for change to a system. Configuration control has four main processes:

   1. Identification and documentation of the need for a change in a change request
   2. Analysis and evaluation of a change request and production of a change proposal
   3. Approval or disapproval of a change proposal
   4. Verification, implementation and release of a change.

4. **Configuration Status Accounting**
   Configuration Status Accounting records and reports the status of configuration items, proposed changes and the implementation status of the approved changes. The activities under status accounting are

   1. Identify list of configuration items along with the complete log of changes.
   2. Complete listing of dates when each version of each configuration item was baselined.
   3. Tracking progress based on baselines for previous releases/versions to be extracted for testing.

5. **Configuration Audits and Reviews**
   Configuration Audits & Reviews are held for a software product to check the integrity of the product prior to delivery. Audits are conducted by Auditors to check whether the defined processes are being followed and ensuring that the SCM goals are satisfied.

HOSPITAL MANAGEMENT SYSTEM

SOFTWARE RISK MANAGEMENT PLAN

Software Development: Risk Management

Most software engineering projects are risky because of the range of serious potential problems that can arise. The primary benefit of risk management is to contain and mitigate threats to project success. You have to identify and plan, and then be ready to act when a risk arises—drawing upon the experience and knowledge of the entire team to minimize the impact to the project.

Software Risk Management Plan

After cataloging risks according to type (technical, project, process, organizational), the software development project manager crafts a plan to record and monitor these risks. As part of a larger, comprehensive project plan, the risk management plan outlines the response that will be taken for each risk—if it materializes. The core of the risk management plan is the risk register, which describes and highlights the most likely threats to a software project.

Software Development Risk Register

To ensure that risks remain in the forefront of project management activities, it's best to keep the risk management plan as simple as possible. For both conventional and agile software project management methodologies, a risk register is a proven tool for organizing and referring to known projects risks. A comprehensive risk register would contain the following attributes:

- **Description of risk** — Summary description of the risk—easy to understand.
- **Recognition Date** — Date on which stakeholders identify and acknowledge the risk.
- **Probability of occurrence** — Estimate of probability that this risk will materialize (%).
- **Severity** —The intensity of undesirable impact to the project—if the risk materializes.
- **Owner** —This person monitors the risk and takes action if necessary.
- **Action** —The contingent response if the risk materializes.
- **Status** — current team view of the risk: potential, monitoring, occurring, or eliminated.
- **Loss Size** —Given in hours or days, this is measure of the negative impact to the project.
- **Risk Exposure** —Given in hours or days, this is a product of probability and loss size.

Software Development Risk Register:

PROJECT NAME	Automated Teller Machine
CLIENT	X Bank
POINT OF CONTACT	Administrator
VERSION NUMBER	1.0
DATE PREPARED	
AUTHOR	Manager
BEGIN DATE	
END DATE	
DURATION	

Software Development Risk Management Table:

Impact Levels	HIGH	MEDIUM	LOW	
Response Status	RISK OPEN		RISK CLOSED	
Plan Status	NO PLAN	PLAN IDLE	PLAN IMPLEMENTED	PLAN FAILED

RISK OVERVIEW				
RISK ID	**DESCRIPTION**	**OWNER**	**REPORT DATE**	**LAST UPDATED**
R001	Data Breach	Admin, Developer		
R002	Data Communication	Admin		
R003	Malware Attacks	Admin		
R004	Network Sniffing	Admin, Developer		
R005	Shoulder Surfing	Admin		

RISK ASSESSMENT				
RISK ID	**IMPACT LEVEL**	**IMPACT DESCRIPTION**	**LIKELIHOOD OF OCCURRENCE**	**PLAN STATUS**
R001	HIGH	Devices running on older versions of OS and not having security updates may open a door for data breaches.	HIGH	PLAN IN PROGRESS
R002	HIGH	Communication gap between the developing members of the project.	MEDIUM	PLAN IDLE
R003	HIGH	Breaking into the ATM machine and manipulating the Cash Dispenser through commands.	LOW	PLAN IN PROGRESS
R004	HIGH	Capturing Data sent through the network for communication with bank servers.	LOW	PLAN IN PROGRESS
R005	HIGH	Looking over customer's shoulders to obtain confidential information.	LOW	PLAN IMPLEMENTED

RISK RESPONSE				
RISK ID	**PLANNED ACTION**	**COMPLETED ACTION**	**RESPONSE STATUS**	**DATE CLOSED**
R001	Make sure all devices are running the latest versions of OS and also use secure websites. (and) Prevent Hacking & Breach of Data by using End-to-End Encryption and Firewalls.	YES	RISK OPEN	
R002	Frequent meetings should be organized for better understanding.	NO	RISK OPEN	
R003	Implement Hardware encryption for all the components so that foreign devices cannot communicate with them.	YES	RISK CLOSED	
R004	Use encrypted data transmission protocols to prevent data hijacking.	YES	RISK OPEN	
R005	Setup security such that only one person can enter into the ATM room.	NO	RISK OPEN	