Software Requirements Specification

for

ATM System

Version 2.0 approved

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1 Introduction

The ATM System version 2.0 is to be developed for Automated Teller Machines(ATM). An ATM is computerized telecommunications device to help users to perform financial transactions, in a public space without the need for a human bank teller.

1.1 Purpose/Objective

This SRS describe the software requirements specifications for ATM (automated teller machine network. The system aims to provide a convenient and secure platform for customer to perform banking transactions

1.2 Document Conventions (Definition, Acronyms, Abbreviations)

1.2.1 Alignment

The entire document is in justified alignment.

1.2.2 Convention for the SRS

1.2.2.1 Font Face: Times New Roman

1.2.2.2 Font Style: None

1.2.2.3 Font Size: 12

1.2.3 Definition

1.2.3.1 Automated Teller Machine (ATM)- an unattended electronics machine in a public place, connected to a data system and related equipment and activated by a bank customer to obtain cash withdrawal and other banking service.

1.2.3.2 Account- A single account at a bank against which transections can be applied. Accounts may be of various types with at least checking and savings. A customer can hold more than one account.

1.2.3.3 ATM Card- A bank card used to access an ATM. Virtually everyone who has a checking account also has a card that can be used at an ATM, in the form of a debit or credit card.

1.2.4 Acronyms

1.2.4.1 ATM: Automated Teller Machine

1.2.4.2 SRS: Software Requirements Specification

1.2.4.3 OTP: One-Time Password

1.2.4.4 UPI: Unified Payment Interface

1.2.4.5 PIN: Personal Identification Number

1.3 Scope

The document applies to Automated Teller Machine software ATM version 1.0. This software facilitates the user to perform various transections in the account without going to bank. This software offers benefits such cash withdrawal, balance checking, deposit, mini statement and some other banking features.

1.4 References

1.4.1 Russel C. Bjork Requirements Statement for Example ATM System. https://www.math.cs.gordon.edu/local/courses/cs320/ATM_Example/Requ ire ments.html

1.4.2 http://en.m.wikipedia.org/wiki/Automated_teller_machine .

2 History/Background Study (Sources of Domain Knowledge)

2.1 Technical Literature

ATM's full form is Automated Teller Machine which is a self-service banking outlet. Extensive research on ATM and online banking systems. This includes studying academic papers, industry journals, and books. The Technical Literature section in the SRS for the ATM System provides a comprehensive review of existing technical resources, research papers, and industry standards related to automated teller machines and financial systems. This section serves as a valuable knowledge base, offering insights into established best practices, security protocols, and technological advancements in ATM software and hardware. By analyzing the technical literature, the development team gains a deeper understanding of the latest trends, challenges, and innovations in ATM technology, which informs their decision-making process and helps them design a robust and cutting-edge ATM system. Additionally, the Technical Literature section ensures that the ATM system aligns with industry standards, adheres to security guidelines, and incorporates proven methodologies, ultimately contributing to the development of a highly efficient, secure, and user-friendly ATM solution.

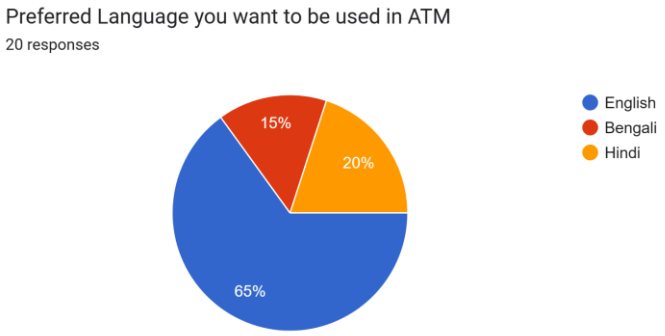
2.2 Existing Applications

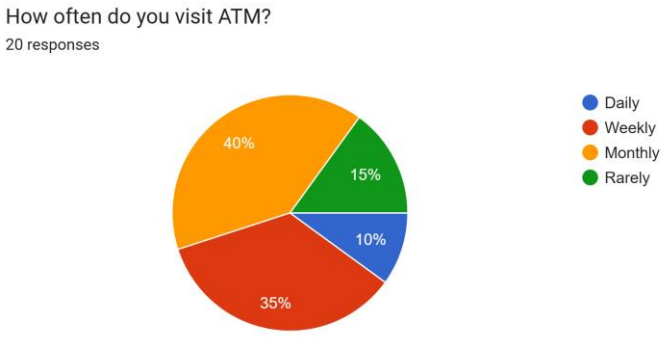
2.2.1 Analysis was conducted on existing ATM applications deployed by various banks and financial institutions. This involved studying the features, functionalities, and user interface of different ATMs, to get insights on best practices and identify potential security issues. You can withdraw money, check your balance, or even transfer funds. Different banks provide their ATM services by installing cash machines in different parts of the country. You can withdraw money from any of these machines irrespective of whether or not you are an account holder in the same bank.

2.2.2 Transactions are either free or bear a nominal charge depending upon the banks. Banks usually do not charge for the first 3-5 transactions in a month. Once you cross the limit of free transactions, you may have to pay a nominal charge. Also, some banks levy charges if you withdraw money from another bank's ATM of which you are not an account holder.

2.3 Customer Surveys

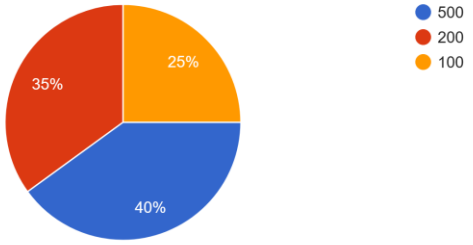
Link: https://forms.gle/umkeMHSgocKhnCz5A





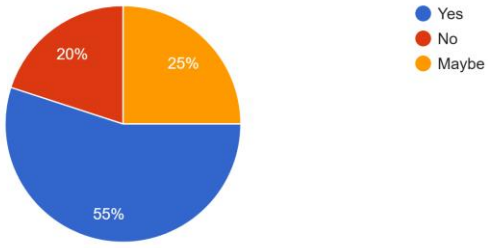
What denominations you prefer while withdrawing cash from ATM?

20 responses



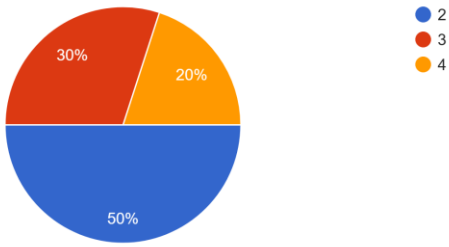
Do you want a receipt of transaction from ATM?

20 responses



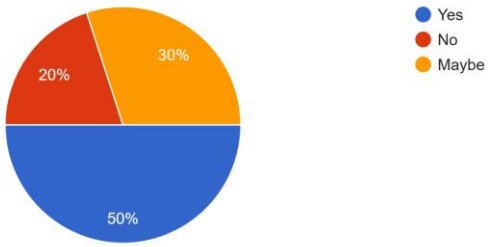
After how many declines in giving wrong information, card should be blocked?

20 responses



Are you satisfied with service provided in an ATM?

20 responses



2.4 Expert Advice

2.4.1 There's no doubt that online and mobile banking are the wave of the banking and payment future, but that doesn't mean consumers will ditch ATMs and branch visits. In fact, as banks redefine themselves to meet the demands of the digital age, they'll need to extend that to the ATM channel. These physical banking touchpoints keep financial institutions connected to their customers, and they are still very much relevant as a bridge between the physical and digital.

2.4.2 According to a 2019 J.D. Power study of all the delivery channels, only ATMs have increased in customer satisfaction scores. And there are still over one million bank branches and 3.2 million ATMs globally, with more than 50 percent of all ATMs estimated to be capable of accepting deposits by 2024 according to RBR Global ATM Market and Forecasts.

2.4.3 Since people now have so many ways to pay, ease of use and convenience are expected no matter how they interact, and that goes for the ATM channel as well. ATMs often function as the main customer-facing element of a financial institution, particularly outside of traditional opening hours, so reliability and efficiency are key factors, too. That means modern ATM technology and simple ATM management are crucial for any financial institution looking to deliver that easy, intuitive customer experience while improving operational efficiency.

2.5 Current/Future requirements

2.5.1 All the current facilities should work correctly and seamlessly.

2.5.2 All future updates can be easily implemented and should work fine with the system.

2.5.3 Make UPI (Unified Payment Interface) applicable using correct PIN.

3 Overall Description

3.1 Product Functions

3.1.1 Hardware Requirement

3.1.1.1 Display Screen

3.1.1.2 Touchpad

3.1.1.3 Keyboard

3.1.1.4 Card reader

3.1.1.5 Card Dispenser

3.1.1.6 Receipt Output

3.1.1.7 Cash Output

3.1.1.8 Deposit Slot

3.1.2 Software Requirement

3.1.2.1 Operating System
3.1.2.2 User Interface
3.1.2.3 Security
3.1.2.4 Protection
3.1.2.5 Transaction
3.1.2.6 Balance calculation
3.1.2.7 Receipt Generator

3.2 Functional Requirements

3.2.1 New User

Description: The New User Login functionality of the ATM system allows individuals without an existing account to create one and gain access to the banking services. Users are prompted to provide their essential personal details, such as name and date of birth, which are securely recorded for identification purposes. Additionally, they are required to select a unique Personal Identification Number (PIN) to ensure account security. Once the account is successfully created, users can use their newly issued ATM card and PIN to log in securely and avail the full range of banking services offered by the ATM system.

3.2.1.1 Input

- Card Insert
- Enter account number
- Enter phone number
- Enter OTP (One Time Password)
- Enter New PIN (Personal Identification N umber)

3.2.1.2 Output

- Display account created successfully

3.2.1.3 Error

- Incorrect OTP

3.2.2 Existing User Login

Description: The Existing User Login functionality of the ATM system facilitates secure access for users who already possess valid accounts. To log in, users are required to insert their registered ATM card into the machine and enter their Personal Identification Number (PIN) for authentication. The system then verifies the provided credentials against the stored records to ensure the user's identity and account validity. Upon successful validation, the user gains access to their personalized banking services, including balance inquiry, cash withdrawal, funds transfer, and more. This user-friendly and efficient login process enables existing customers to perform various financial transactions conveniently and with the utmost security.

3.2.2.1 Input

- Card Insert

- Enter PIN

3.2.2.2 Output

- Display account details

3.2.2.3 Error

- Invalid PIN

3.2.3 User Authentication

Description: User authentication is a crucial process in the ATM system that verifies the identity of individuals attempting to access their bank accounts. It involves two main steps: first, the user provides their unique ATM card, and second, they enter their Personal Identification Number (PIN). The system then matches the provided information with the records stored in the database to authenticate the user's identity and ensure they are authorized to use the services. This robust authentication mechanism safeguards against unauthorized access, protects sensitive financial information, and ensures that only legitimate account holders can utilize the ATM's functionalities securely.

3.2.3.1 Input

- PIN / Biometric verification
- Limit for inserting incorrect PIN

3.2.4 Cash Withdrawal

Description: The Cash Withdrawal functionality in the ATM system enables authorized users to access and withdraw funds from their bank accounts conveniently. To initiate a withdrawal, the user must successfully authenticate themselves through their ATM card and Personal Identification Number (PIN). Upon authentication, the system allows the user to specify the desired withdrawal amount, and after confirming the transaction, the ATM dispenses the requested cash. Simultaneously, the system updates the user's account balance to reflect the deducted amount. This secure and efficient process empowers users with quick access to their funds while maintaining a robust level of security and accuracy in managing their financial transactions.

3.2.4.1 Input

- Enter amount
- Select Denominations
- Calculate balance after withdrawal
- Give receipt

3.2.5 Cash Deposit

Description: The Cash Deposit functionality in the ATM system offers users a convenient way to add funds to their bank accounts. To make a deposit, the authenticated user begins by selecting the "Cash Deposit" option on the ATM screen. They then input the amount of cash they wish to deposit into the machine. The user is prompted to insert the cash into a designated slot or envelope provided by the ATM. After completing the deposit process, the ATM verifies

the amount deposited, and the transaction is recorded. The system updates the user's account balance, reflecting the newly added funds. This feature simplifies the cash deposit process, reducing the need for in-person visits to bank branches and ensuring secure and accurate recording of deposited funds.

3.2.5.1 Input

- Keep amount in deposit slot
- Calculate current balance

3.2.6 Account Management

Description: The Account Management functionality in the ATM system provides users with a range of features to manage their bank accounts efficiently. Authenticated users can access this feature to perform various account-related tasks, such as checking their account balance, viewing transaction history, updating contact information, and changing their Personal Identification Number (PIN) for enhanced security. Additionally, users may link or unlink accounts, set account preferences, and customize transaction limits based on their preferences. Account Management ensures customers have seamless control over their financial information, allowing them to stay informed, maintain security, and personalize their banking experience according to their specific needs and requirements.

3.2.6.1 Input

- Enter old PIN
- Enter new PIN
- Enter old phone number
- Enter new phone number
- Enter OTP after inserting new phone number / PIN

3.2.6.2 Output

- Display successful change

3.2.6.3 Error

- Incorrect OTP

3.2.7 Transaction receipt

Description: The Transaction Receipt functionality in the ATM system provides users with a printed record of their completed transactions. After successfully executing a transaction, such as cash withdrawal, funds transfer, or cash deposit, users have the option to request a printed receipt for their records. The ATM system generates a detailed receipt that includes transaction specifics, such as the date, time, transaction type, amount, and the remaining account balance. The printed receipt offers users a tangible confirmation of their completed transaction, promoting transparency and facilitating easy record-keeping. This feature ensures users can verify the accuracy of their transactions and serves as a valuable reference for financial reconciliation and tracking past activities within their account.

3.2.7.1 At the end of all transactions give receipt

3.2.8 System Security

Description: System Security is a fundamental aspect of the ATM system, aimed at safeguarding sensitive user data, preventing unauthorized access, and ensuring the overall integrity of the system. The ATM system employs robust security measures, including encryption protocols, to protect the communication and transmission of data between the user and the ATM. User authentication through Personal Identification Numbers (PINs) and ATM cards adds an additional layer of security, ensuring that only authorized individuals can access their accounts.

3.2.8.1 Block card temporarily if incorrect PIN insertion exceeds the limit

3.3 Non-Functional Requirements

3.3.1 Correctness Requirement

In order to produce quality software, following are the measures:

3.3.1.1 Correct PIN should be inserted

3.3.1.2 All functionality must be thoroughly tested.

3.3.1.3 The ATM system shall accurately process all transactions initiated by users, ensuring that the correct amount is dispensed during cash withdrawals and accurately reflected in the user's account during funds transfers and deposits.

3.3.1.4 The system shall verify user authentication details, such as ATM card information and Personal Identification Numbers (PINs), to grant access only to authorized account holders, preventing unauthorized access to sensitive financial information.

3.3.1.5 The ATM system shall update the user's account balance in real-time after each transaction, ensuring that the displayed balance is accurate and up-to-date.

3.3.1.6 The system shall implement robust error-handling mechanisms to detect and handle any unexpected situations or anomalies that may arise during user interactions, ensuring that users are appropriately notified of any errors.

The ATM system shall employ encryption and secure data transmission protocols to maintain the integrity and confidentiality of user data, protecting against data tampering or unauthorized access.

3.3.2 Portability requirement

3.3.2.1 Software should work in ATMs of all branches.

3.3.2.2 All functionality must be thoroughly tested.

3.3.3 Efficiency Requirement

3.3.3.1 Good connectivity with the bank network.

3.3.3.2 Card verification and PIN verification should be in seconds.

3.3.3.3 Touch screen and button responses should be instantaneous.

3.3.4 Usability Requirement

3.3.4.1 The interface should be simple enough so that both professionals and novices from all fields of work in eligible age groups should be able to use the system to withdraw cash.

3.3.4.2 Proper care needs to be taken so that there is no inconsistency in the transaction process leading to abnormal shutdown of the ATM.

3.3.4.3 The interface should be simple enough so that both professionals and novices from all fields of work in eligible age groups should be able to use the system to withdraw cash**.**

3.3.4.4 Proper care needs to be taken so that there is no inconsistency in the transaction process leading to abnormal shutdown of the ATM.

3.3.5 Reusability Requirement

3.3.5.1 The ATM software should be made on the concepts of modularity, so that submodules of the product can be used for other ATM software.

3.3.6 Reliability Requirement

3.3.6.1 Speed should be moderate and cater to correct account management.

3.3.6.2 The data communication protocol shall be such that it ensures reliability and quality of data and transactions in heavy workload environments.

3.3.7 Maintainability Requirement

3.3.7.1 The ATM box should be tightly inserted so that theft can be prevented

3.3.7.2 Software should be checked and updated as and when required

3.3.8 User Characteristics

3.3.8.1 One with no earlier experience in usage of ATM machines or someone who has less technical knowhow.

3.3.8.2 One who has used ATMs multiple times and can traverse through ATM interfaces with ease.

3.3.8.3 One who is responsible for maintaining the ATM machines so that workflow of the ATM software is smooth and hassle free at all times.

3.4 Design & Implementation Constraints

3.4.1 Easy to use and understandable

3.5 Assumptions & Dependencies

3.5.1 Bank database is maintained correctly by the bank administration and network connectivity is good.

3.5.2 Hardware never fails

3.5.3 ATM is updated according to the bank policies.

3.5.4 Limited number of transactions per day.

4 Interface Requirements

4.1 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. The User Interface (UI) of the ATM system is designed to provide a user-friendly and intuitive experience for customers during their interactions with the machine. The ATM screen displays a clear and straightforward menu, guiding users through various banking functionalities with easy-to-understand instructions and options. The UI incorporates a logical flow, enabling users to navigate through transactions seamlessly.

4.1.1 A login screen is provided in the beginning for entering the required username/pin no. and account number.

4.1.2 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 anyone.

4.1.3 To ensure accessibility, the ATM system supports multiple language options, allowing users to select their preferred language for on-screen interactions. Moreover, the interface provides clear instructions for each step of the transaction process, ensuring users feel confident and informed throughout their ATM interactions.

4.1.4 The ATM system's user interface prioritizes user security, hiding PIN entries and displaying transaction receipts only upon user request. Overall, the user interface is designed to be visually appealing, efficient, and user-centric, aiming to create a positive and satisfying experience for customers using the ATM services.

4.2 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:

4.2.1 There should be constant power supply.

4.2.2 The card reader should be a magnetic tape reader.

4.3 Software Interfaces

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

4.3.1 The card management software used to verify pin no and login shall be CMS version 3.0.

4.3.2 The database used to keep record of user accounts shall be Oracle version7.0.

4.4 Communication Interfaces

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:

4.4.1 The communication protocol used shall be TCP/IP.

5 Conclusion

Therefore, this SRS describe the software requirements specifications for ATM (automated teller machine network and the system aims to provide a convenient and secure platform for customer to perform banking transactions. The system will also accommodate an operator who will load money in the ATM machine, validate deposits made by a customer, and make sure the system hardware is always on and on power. Care must be taken that all the interfaces, communication protocols, and most importantly the software, work glitch free and smoothly.