ATM SRS - good

Computer Science and Engineering (Maulana Abul Kalam Azad University of Technology)

Software Requirements Specification

for

ATM System

Version 1.0 approved

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Techno Main Salt Lake

20-07-2022

Table Of Contents

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

The purpose of this software requirements and specification (SRS) is to define External Interface, Performance and Software System Attributes requirements of ATM version 2.0. This document is intended for the customer and developer (designer, testers and maintainers).

1.2 Document Conventions

1.2.1 Alignment

The entire document is in justified alignment.

1.2.2 Convention for the Main Title

1.2.2.1 Font Face: Times New Roman

1.2.2.2 Font Style: None

1.2.2.3 Font Size: 22

1.2.3 Convention for the Sub Title

1.2.3.1 Font Face: Times New Roman

1.2.3.2 Font Style: None

1.2.3.3 Font Size: 18

1.2.4 Convention for the Body

1.2.4.1 Font Face: Times New Roman

1.2.4.2 Font Style: None

1.2.4.3 Font Size: 12

1.2.5 Definition

1.2.5.1 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 customerto obtain cash withdrawal and other banking service.

1.2.5.2 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.

1.2.5.3 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.

1.2.6 Acronyms

1.2.6.1 ATM: Automated Teller Machine
1.2.6.2 SRS: Software Requirements Specification
1.2.6.3 RBR: Retail Banking Research
1.2.6.4 PIN: Personal Identification Number
1.2.6.5 OTP: One-Time Password
1.2.6.6 OS: Operation System
1.2.6.7 XFS: Extents File System
1.2.6.8 VGA: Video Graphics Array
1.2.6.9 AC: Alternating current
1.2.6.10 BMS: Bank Management System
1.2.6.11 CMS: Cash Management Services
1.2.6.12 TCP/IP: Transmission Control Protocol/Internet Protocol
1.2.6.13 FTP: File Transfer Protocol

1.3 Scope

The document applies to Automated Teller Machine software ATM version 1.0. This software facilities 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

1.1.1 Russel C. Bjork Requirements Statement for Example ATM System.
1.1.2 https://www.math-cs.gordon.edu/local/courses/cs320/ATM_Example/Requirements.html
1.1.3 http://en.m.wikipedia.org/wiki/Automated_teller_machine
1.1.4 https://www.math-cs.gordon.edu/local/courses/cs320/ATM_Example/Requirements.html

2 Background Study

2.1 Technical Literature

2.1.1 ATM's full form is Automated Teller Machine which is a self-service banking outlet. 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.

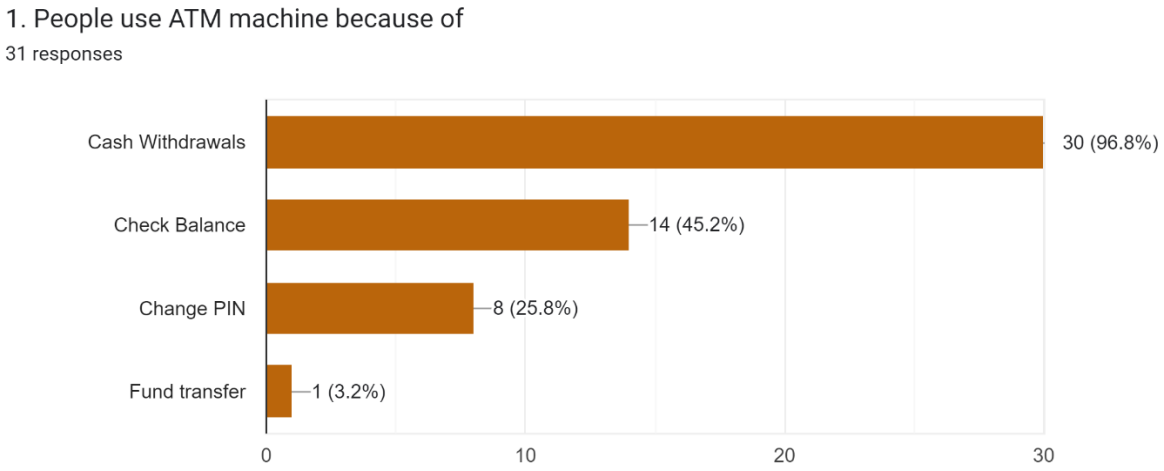
2.1.2 Transactions are either free or bear a nominal charge depending upon the banks. Banks usually do not charge for the first 3-5 transactions in a month. Once you cross the limit of free transactions, you may have to pay a nominal charge. Also, some banks levy charges if you withdraw money from another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

2.2 Existing Applications

2.2.1 Diebold Agilis EmPower
2.2.2 KAL ATM Software
2.2.3 Absolute Systems Absolute INTERACT
2.2.4 Triton PRISM
2.2.5 Phoenix Interactive VISTAatm
2.2.6 Euronet EFTS
2.2.7 Wincor Nixdorf ProTopas

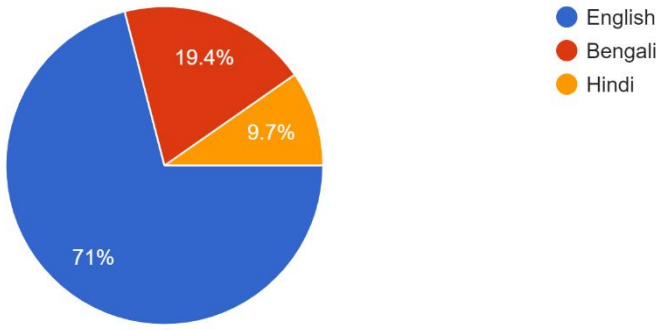
2.3 Customer Surveys

Survey Link: https://docs.google.com/forms



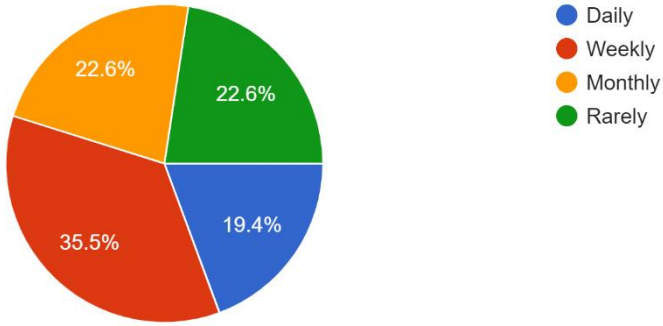
2. Preferred Language you want to be used in ATM

31 responses



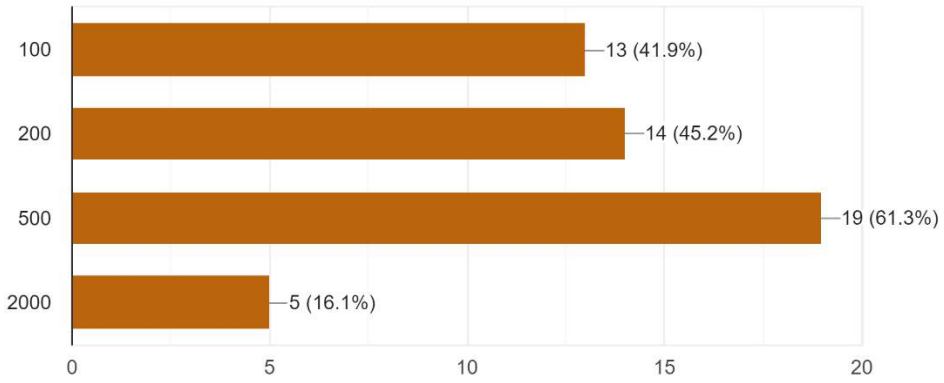
3. How often do you visit ATM?

31 responses



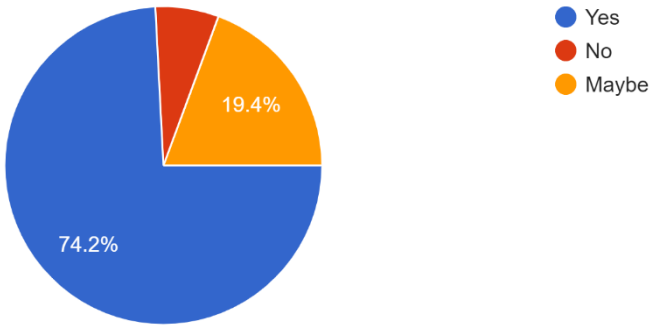
4. What denominations you prefer while withdrawing cash from ATM?

31 responses



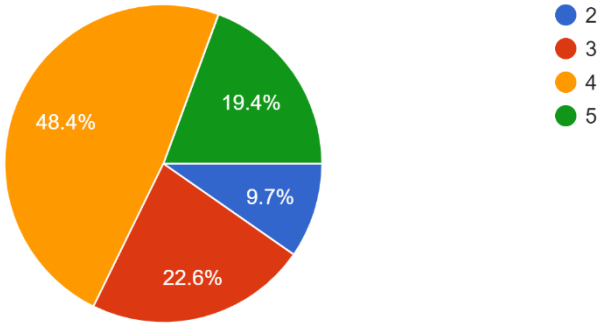
5. Do you want a receipt of transaction from ATM?

31 responses



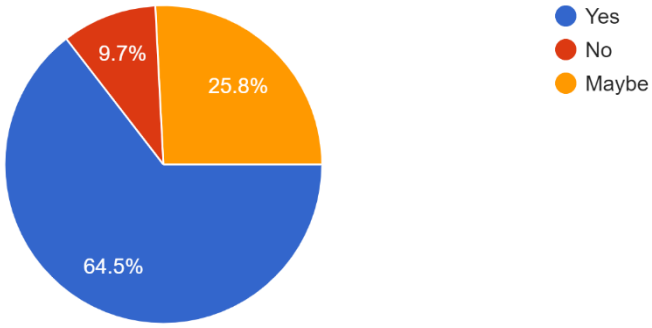
6. After how many declines in giving wrong information, card should be blocked?

31 responses



7. Are you satisfied with service provided in an ATM?

31 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 Primary withdrawal, balance checking, Choice of language, Mini Statement generation, Card Pin Resetting, and cancelling transactions midway must work without errors in the ATM.

2.5.2 Scope should be kept available so that in future changes and modifications related to additional banking services can be made with ease.

3 Overall Description

3.1 Product Functions

The functions of the system are: login after ATM card checking, changing pin, balance inquiry, cash withdraw with denominations, depositing cash, receiving a mini statement.

3.1.1 Hardware Requirement

3.1.1.1 The software to be designed will control a simulated automated teller machine (ATM) having a magnetic stripe reader for reading an ATM card, a 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.

3.1.1.2 The ATM will communicate with the bank's computer over an appropriatecommunication link.

3.1.2 Software Requirement

3.1.2.1 The ATM will communicate each transactionto the bank and obtain verification that it was allowed by the bank.

3.1.2.2 In the case of a cash withdrawal or deposit, a second message will be sent after the transaction has been physically completed (cash dispensed or envelope accepted).

3.1.2.3 If the bank determines that the customer's PIN is invalid, the customer will be requiredto re-enter the PIN before a transaction can proceed.

3.1.2.4 If the customer is unable to successfully enter the PIN after three tries, the card will be permanently retained by the machine for 24

hours, and the customer will have to contact the bank to get it back.

3.1.2.5 If a transaction fails for any reason other thanan invalid PIN, the ATM will display an explanation of the problem, and will then ask the customer whether he/she wants to do another transaction.

3.2 Functional Requirements

3.2.1 Select Language

3.2.1.1 Input: “language” options.

3.2.1.2 Output: User can select any language.

3.2.1.3 Error: Wrong button was pressed.

3.2.2 Card Verification

3.2.2.1 Input: Prompts the user to insert the card.

3.2.2.2 Output: Checks if the card is valid.

3.2.2.3 Error: Displays Error message and returns the card if,

3.2.2.3.1 The information on the card is not readable.

3.2.2.3.2 The card is not Supported by the ATM.

3.2.2.3.3 The card is expired.

3.2.3 Select Account Type

3.2.3.1 Input: Types of Accounts options.

3.2.3.2 Output: User can select any accounts option.

3.2.3.3 Error: Wrong button was pressed.

3.2.4 Select Options

3.2.4.1 Change Pin

3.2.4.1.1 Input: Select Change/Reset Pin. Enter existing pin and enter and re-enter new pin.

3.2.4.1.2 Output: OTP will be sent in your phone and the pin will be changed.

3.2.4.1.3 Error1: OTP is not matching.

3.2.4.1.4 Error2: Old pin is not matching.

3.2.4.1.5 Error3: Re-entered pin is not matching.

3.2.4.2 Check account balance

3.2.4.2.1 Input: Enter option to display balance after password checking.

3.2.4.2.2 Output: The Balance will be displayed.

3.2.4.3 Withdraw cash

3.2.4.3.1 Input: Enter the amount to withdraw after password checking.

3.2.4.3.2 Output: Amount of money to be dispensed is displayed. Money is dispensed if there is no error.

3.2.4.3.2.1 Error1: Money is more than the amount in account

3.2.4.3.2.2 Error2: Amount is not available in ATM

3.2.4.3.2.3 Error3: The amount exceeds the maximum withdrawing limit.

3.2.4.3.3 Denomination:

3.2.4.3.3.1 Offers user to select cash note type

3.2.4.3.3.2 Shows errors if ATM does not have the

required notes.

3.2.4.4 Deposit cash

3.2.4.4.1 Input: Enter the amount to deposit after password checking. Prompts theuser to put required cash in cash deposit slot, then click continue.

3.2.4.4.2 Output: ATM will count the cash and displays the amount. If amount is correct amount will be deposited.

3.2.4.4.3 Error: the amount entered is not matching with the amount given.

3.2.4.4.4 Error2: The amount exceeds the maximum deposit permit.

3.2.4.5 Mini Statement

3.2.4.5.1 Input: Enter option to display mini bank statement.

3.2.4.5.2 Output: The ATM will print out the mini bank statement containing the 10 recent transactions.

3.2.5 Enter Password

3.2.5.1 Input: Use numbered keypad to type in the pin.

3.2.5.2 Output: Verification of the pin.

3.2.5.3 Error:

3.2.5.3.1 Rejects the card if pin code is wrong.

3.2.5.3.2 Displays error message and suggests to call the bank for entering wrong pin for the fourth time and disables the card for 24 hours.

3.2.6 Choose to get receipt

3.2.6.1 Input: Yes or No.

3.2.6.2 Output: The ATM will provide the customer with a printed receipt for each successful transaction, showing the date, time, machine location, type of transaction, account(s), amount, and ending and available balance(s)of the affected account.

3.2.7 Cancelling

3.2.7.1 The customer shall abort a transactionwith the press of a Cancel key.

3.2.8 Release card

3.2.8.1 Input: Prompts user to pick up the card after releasing.

3.2.8.2 Output: Thanks User.

3.2.8.3 Error: If card is not picked up, it keeps telling user to remove the card.

3.3 Non-Functional Requirements

3.3.1 Correctness Requirement

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

3.3.1.1 All code must be consistent.

3.3.1.2 All functionality must be thoroughly tested.

3.3.2 Portability requirement

3.3.2.1 ATM software must be made portable so that it works on other OS, apart from Microsoft Windows, like XFS Platforms.

3.3.3 Efficiency Requirement

3.3.3.1 Card Verification, PIN verification should be instant under a second even under heavy workloads.

3.3.3.2 Cash dispensing time should not exceed 4 sec even under heavy workloads.

3.3.3.3 Touch screen and button response times 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.

3.3.5 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 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 system can be serviceable so that future modifications to upgrade system is easily possible.

3.3.7.2 The system should be able to self-monitor errors in software, and inform the branch in case of abnormal faults or errors.

3.4 User Characteristics

3.4.1 A Novice User - One with no earlier experience in usage of ATM machines or someone who has less technical knowhow.

3.4.2 A Technically Sound User – One who has used ATMs multiple times and can traverse through ATM interfaces with ease.

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

3.5 Design & Implementation Constraints

The major constraints that the project has are as follows:

3.5.1 The ATM must service at most one person at a time.

3.5.2 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.

3.5.3 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 Rs10,000 and the maximum amount he can withdraw in a day is Rs 20,000.

3.5.4 Before the transaction is carried out, a check is performed by the machine to ensure that a minimum amount is left in the user's account after the withdrawal failing which the withdrawal is denied.

3.5.5 The minimum amount a user can deposit is Rs 100/-and the maximum amount he can deposit is Rs 10,000/-.

3.5.6 There shall be a printer installed with the machine to provide the user with the printed statement of the transaction.

3.5.7 For voice interactions, speakers should also be there to accompany the machine.

3.6 Assumptions & Dependencies

3.6.1 The reader is assumed to have a basic knowledge of banking accounts and accounts services.

3.6.2 Hardware never fails.

3.6.3 Limited amount of money withdrawn per day.

3.6.4 Limited number of transactions per day.

3.6.5 ATM casing is impenetrable.

3.6.6 ATM is always updated with respect to bank policies regarding different services. 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.

3.6.7 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.

4 Interface Requirements

4.1 User Interfaces

4.1.1 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

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

4.1.1.2 An unsuccessful login leads to a reattempt (maximum three) screen for again enteringthe same information. The successful login leads to a screen displaying a list of supported languages from which a user can select anyone.

4.1.1.3 In case of administrator, a screen will beshown having options to reboot system, shut

down system, block system, disable any service.

4.1.1.4 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.

4.1.1.5 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.

4.1.1.6 Administrator is also provided with a screen that enables him to block any service provided to the user by entering thename of the service or by selecting it from the list displayed.

4.1.1.7 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.

4.1.1.8 A screen will be provided for user to check his account balance.

4.1.1.9 A screen will be provided that displays the location of all other ATMs of same bank elsewhere in the city. A screen will be provided for the user to perform various transactions in his account.

4.1.2 Other various user interface requirements that need to be fulfilled are as follows:-

4.1.2.1 The display screen shall be of 10" VGA color type. The display screen shall have 256 color resolution. The display screen shall also support touch screen facility.

4.1.2.2 The speakers shall support Yamaha codecs. The keypad shall consist of 16 tactile keys. There shall be 8 tactile function keys. The keyboard will be weather resistant.

4.1.2.3 The transaction receipt shall be 3.1" × 6". The statement receipt shall be 4.2" × 12". The deposit envelopes shall be 9" long and 4" wide.

4.2 Hardware Interfaces

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

4.2.1 The ATM power supply shall have a 10/220 V AC manual switch.

4.2.2 The ATM card should have the following physical dimensions: Width- 85 mm, Height- 54 mm, Thickness- 0.75 mm.

4.2.3 The card reader shall be a magnetic stripe reader.

4.2.4 There shall be a 40-column dot matrix receipt printer.

4.2.5 The receipt dispenser shall be a maximum of 4" widthand 0.5" thickness.

4.2.6 Screen resolution of at least 800X600-required for proper and complete viewing of screens. Higher resolution would not be a problem.

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 transaction management software used to manage the transaction and keep track of resources shall be BMS version 2.0.

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

4.3.3 Yamaha codecs 367/98 for active speakers.

4.3.4 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 system will employ dial-up POS with the central server for low-cost communication.

4.4.2 The communication protocol used shall be TCP/IP.

4.4.3 Protocol used for data transfer shall be File Transfer Protocol (FTP).

5 Conclusion

This ATM's software is designed in such a way that the user will access and use the ATM and then accesses the banking system, which updates, configures and accesses the details and data of the user from his/her database. Care must be taken that all the interfaces, communication protocols, and most importantly the software, work glitch free and smoothly, so that the ATM transaction is hassle free, ensuring reliable service to end users using the ATM. 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.