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**CLASS: SOFTWARE ENGINEERING (151)**

**OBJECT ORIENTED DESIGN AND ANALYSIS**

**ATM System requirements**

# Introduction

**AUTOMATED TELLER MACHINES** are part of our lives, they help us in doing our daily transactions and businesses.

An ATM is a computerized telecommunications instrument that provides its users an access to their bank account and makes them able to perform their financial transaction and operations without the need of going to the bank, and without the help or assistance of a human (cashier, clerk, bank teller).

**ATM** makes it easy for people to get their money anywhere any time as long as there is an internet connection.

We need **ATM** machines because not only banks are not open every day, but also even if they were to work every day in a month we wouldn’t necessarily have the time to go to the bank

The main objective of this project is to model and design an ATM system from a point of view of software development.

This documents content’s will be the requirements that will be identified for the system, our system will act as a second person with whom a user (bank customer) can interact, and based on the user’s choice the system will be performing a set of operations.

# ATM specification

An ATM is primarily a machines and as we all know machines are made of component which differs according to the machines that we are talking about.

Out system’s hardware is mainly a computer running some operating system (Windows OS) on which our software system will be installed. The computer without the software would be useless

## Component

* Key Switch : to start up or shut down the machine
* Card Reader : to read user’s Cards
* Screen : to display various messages to the user
* Key pad: to allow to user to input information such as Password, Amount.
* Cash dispenser : for dispensing cash
* Deposit slot : to deposit user’s cash
* Mini printer : for printing transaction receipts
* Network interface : used by the System to communicate with its main server

## Business

Each ATM machines around the City will be maintained by an operator from the Bank whose job will be to fill the ATM with cash and paper for receipts.

The ATM should not shut down or freeze while being used.

To begin any new transaction the User must insert his (her) ATM card. The card contains every information that the bank has about the user (name, SSN).

The user will then be prompt to input his password, once the user has confirmed his password, the Machine would have to remotely access the Bank server in order to validate the User’s information.

In case the user’s password is wrong the user will be given a second and a third attempt.

If after these two attempt the password is still wrong, the Machine will lock the user’s card and display a friendly message telling the user to go the nearest bank office for further services.

The machines is conceived to handle any kind of problems. Problems such as hardware or software failures. The machines keeps an internal log for recording such events.

Logs are sent to the Bank server and can be used by technicians and engineers to fix the corresponding problems.

### Assumptions

1. The ATM will identify its various users through their Passwords
2. Bank officers will be able to check ATM transactions from the bank database.
3. User’s deposit will immediately be added to their account if the notes are valid
4. ATM cars will be the main player when it comes to security.

## ATM interactions

An ATM machine is a machine that is to interact with external factors such as the Bank Database System, The Bank customers, and maintenance engineers, bank officers.

For each interaction, the operations will be different based on the user that interacting with the system.

### ATM maintenance engineer (operator) interaction

The maintenance engineer will be responsible for:

* Turning the ATM machine ON/OFF
* Refiling the machine with cash
* Refill the mini printer with paper

### ATM Bank customer interaction

The different operations for a Bank customer are:

* Cash withdrawal
* Fund deposit
* Fund transfer
* Balance inquiry
* Bills payment
* Print receipt
* Open session
* Close Session

### ATM Bank officer’s interaction

(The interaction between the bank officers and the ATM is done via the Bank’s database)

* Check deposit history log
* Check withdrawals log
* Check Number of transaction per day

### ATM Bank’s database system interaction

* Authenticating user’s information (Password)
* Retrieving user’s account information
* Recording user’s transactions

# ATM system Requirements

The software that we are to design will be used as an interface to control the machine’s hardware, the system will be able to communicate with the bank’s database via a network (TCP or UDP).

The System will service on user at a given time, the user will insert his card into the machine, input his personal password. These his information will then be sent to the bank system for authentication. Once a user is confirmed he will have access to a menu with available operations that can be performed on the system.

This section will describe the role of each user for our system, as well as the functional and nonfunctional requirement of the system.

The Atm system will have many user. The first one is the ATM operator whose role is to turn the Machine On/Off, refill the machine with cash in case the machine is empty, refill the machine with paper for the printer.

The second user is the bank customer. This is the user target, this user must be able to make a cash deposit and withdrawal of any suitable amount.

He should be able to transfer money from his account to another account of his choice. He should be able to perform balance inquiry, which will allow him to know the exact amount of money contained in the bank account.

The bank customer must be able to pay his bills (Water, electricity bill) using the system.

After performing an operation (operation mentioned above), the user should be able to print a receipt with the detail of the operations performed that could be used as a proof in the future.

The third user(s) is (are) bank officers, these users have a special set of operation that they can perform on the ATM.

These users can check the deposit the deposit and history logs for each bank users that have used any ATM machine, whether it is in the same city. Or in another one, as long as it is a customer of the bank.

The can also check the total number of transactions for a specific client or for every client in general.

The bank officers don’t directly interact with the ATM machines.

Their interaction is done through the bank database.

The last user for the ATM machine will be the bank database. It should be able to authenticate user’s information, retrieve user’s account information from the bank database and forward then to the ATM, record every user’s transactions and send them to the database.

## ATM system functional requirements table

|  |  |  |
| --- | --- | --- |
| **Requirement ID** | **Requirement statement** | **Remarks** |
| **#FR**1 | The system must provide the user with an interface to input his card, as well as one for the password. | None |
| **#FR2** | A user cannot in any case access his bank’s account and perform any task without first confirming his information. | None |
| **#FR3#** | Withdrawal can be done by a user if and only if the amount of money to be withdrawn is less that the actual amount in the account. | User having special credit card can withdraw even if the amount is less |
| **#FR4** | Fund transfer can be done by a user if and only if the amount of money to be withdrawn is less that the actual amount in the account. | User having special credit card can withdraw even if the amount is less |
| **#FR5** | Bill payment can be done by a user if and only if the amount of money to be withdrawn is less that the actual amount in the account. | User having special credit card can withdraw even if the amount is less |
| **#FR****5** | A user can print his(her receipt) only if the mini printer contains papers | None |

## ATM system non-functional requirements table

|  |  |  |
| --- | --- | --- |
| **Requirement ID** | **Requirement statement** | **Remarks** |
| **#NFR1** | The System Must be secured and unhackable | The possibility of being hacked is inevitable |
| **#NFR2** | The System must be functional everyday  and users must be able to access their account at any time. | In case of maintenance the system won’t be available for a few minutes |