University of Pretoria
Software Engineering - COS 301

Next Generation ATM Requirements Specification

Group 6
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Author(s):

Dewald van Hoven	**u15030378**
Justin Grenfell	**u16028440**
Luveshan Marimuthu	**u17087709**
Muhammed Ismail Carrim	**u15019854**
Tlou Lebelo	**u15209190**

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1 Introduction

1.1 Purpose

This document describes the Software Requirements Specification (SRS) for a next generation Automatic Teller Machine (ATM) system.

1.2 Scope

The aim of this project is to improve on existing ATM systems and change how clients interact with the ATM's and reduce wait time at the ATM. This will be achieved by increasing the amount of ways in which people can use the ATM's such as adding QR codes and using NFC readers as ways for clients to access the ATM.

The system will introduce various new ways in which clients may interact with the ATM with extra security. The primary features will include:

- Withdraw money using NFC
- Withdraw money using QR codes
- Printing bank statements at the ATM machines
- Facial recognition for security
- Choosing withdrawal(bill) denominations
- ATM WiFi for those without their own connection
- Stylish Geometric Interface

1.3 Definitions, acronyms and abbreviations

The following are the abbreviations and acronyms used in this SRS document:

- ATM - Automated Teller Machine - An electronic device that allows customers of financial institutions to perform financial transactions without anynone working for the institution present.
- NFC - Near Field Communication - Short range (Around 4cm) communication between 2 electronic devices.
- QR Code - Quick Response Code - two-dimensional barcode that contains small amounts of data to allow for communication.
- EFT - Electronic Funds Transfer - Transferring funds using a machine and a bank card.
- Vendor - A vendor is any business that has and EFT machine and a cash register and is authorized by the bank to do so. This makes it possible for a user to acquire cash from said vendor

2 User Characteristics

2.1 User that does not have an NFC compatible device

This user will use an NFC compatible bank card instead. The user will have to complete his transaction via the interface displayed on the ATM machine as his mobile phone will not be able to interact with the NFC reader. The ATM will provide clear prompts on how he can complete the transaction in the most efficient way. However, this user can still do a transaction on the mobile banking app and withdraw cash via a vendor using the QR code.

2.2 User that has an NFC compatible device

The user will be able to complete the majority of his/her transaction on the bank's mobile banking application. After completing the transaction on the app, he/she just has to scan his device at the ATM machine or scan a QR code with a vendor to complete the transaction with the bank. All information that the user needs will be available in the banking app.

2.3 Maintenance personnel

The maintenance personnel is in charge of storing cash into the ATM vault and repairing the ATM in case of malfunction. They are presented with a different display when they log in with the administrator's password and is provided with options different from that of a normal user. They have the authority to change or restrict various features provided by the software in situations of repairing.

2.4 Merchant/Vendor

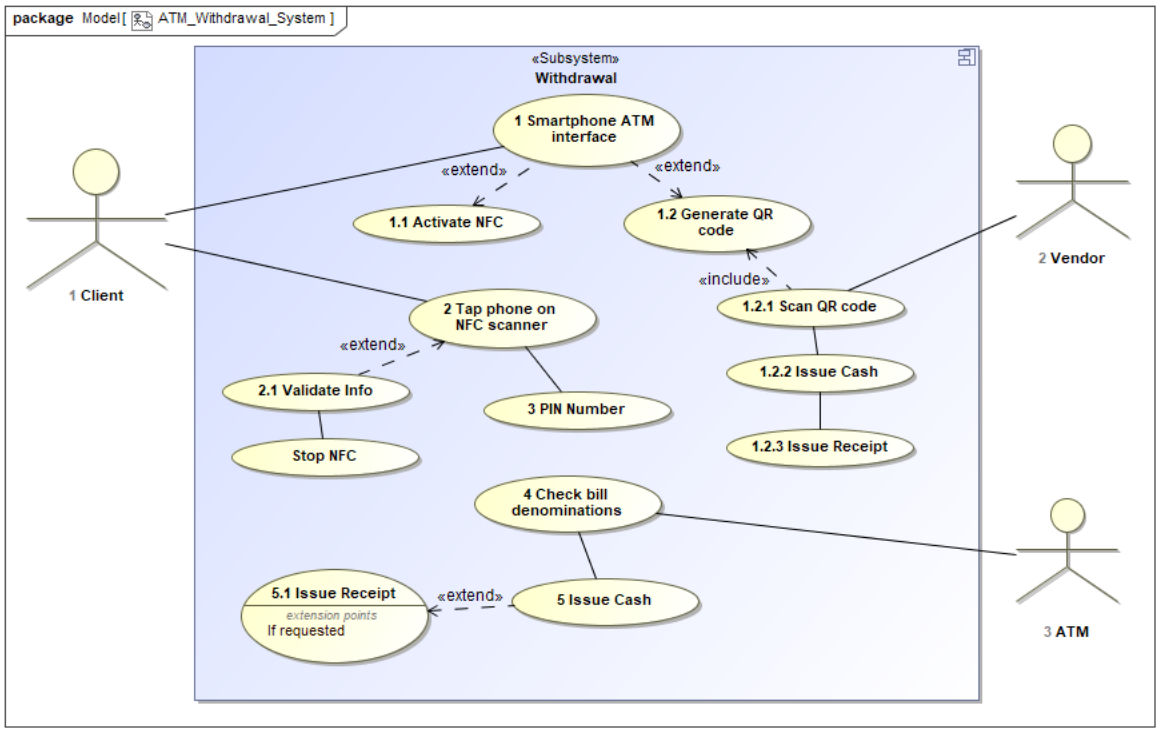
An affiliated merchant/vendor, that is authorized by the bank, can dispense cash to customers upon the successful scanning of a QR code from the FNB banking application.

3 Functional Requirements

3.1 Requirements and Use Cases

- **R01**: NFC/QR code withdrawal system on ATM
  The new NFC/QR code withdrawal system begins with the client entering the withdrawal information on their phone through the FNB app(see R02 below)
  Once the client has reached the ATM, they tap the phone on the NFC reader on the ATM. The ATM will receive and validate the withdrawal information and ask the client to enter their PIN number onto the keypad. If the PIN is correct then the withdrawal is successful and client receives the cash.
  An electronic slip is sent to the clients app if requested.

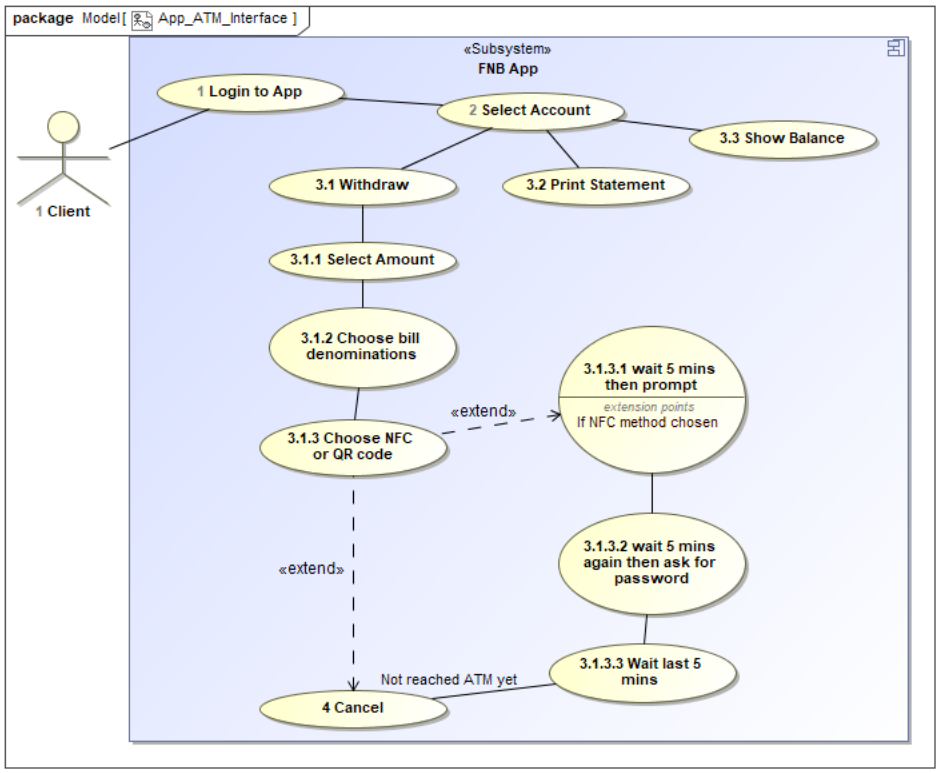
Use Case 1



- **R02**: Smartphone ATM interface
  The client logs into the FNB app on their phone, using their online username and password, and selects the option to withdraw cash from an ATM. This takes them to the new Smartphone ATM interface. The client can choose to generate a QR code to use at a store or to activate the NFC transfer on the phone. If the client chose to activate the NFC, the phone will wait for the client to reach the ATM. After 5 minutes of waiting it will check if the client is "still there" and wait another 5 minutes if the client clicked 'Yes' (If the client clicked 'No' then cancel transaction). If the transaction still has not taken place after the second 5 minutes it will prompt to re-enter the online password and wait for the final 5 minutes before cancelling the withdrawal. Each prompt will remain on the user's screen for 30 seconds. If the user does not respond, the transaction will cancel. (maximum wait time is 15 minutes)

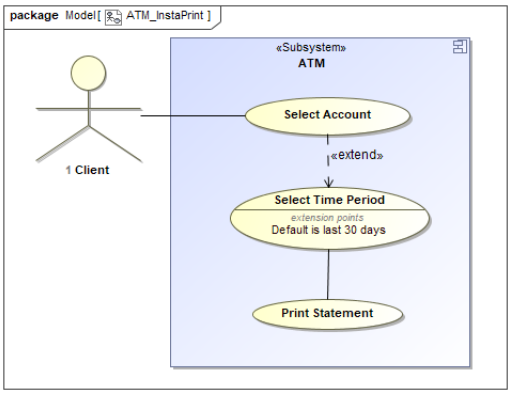
  - **R02.1**: Choosing Denominations
    The client is provided the option of choosing which denominations of bills should be issued by the ATM when issuing the withdrawal amount. (Availability of bills will be checked at ATM and will change automatically if some bills are unavailable).

Use Case 2



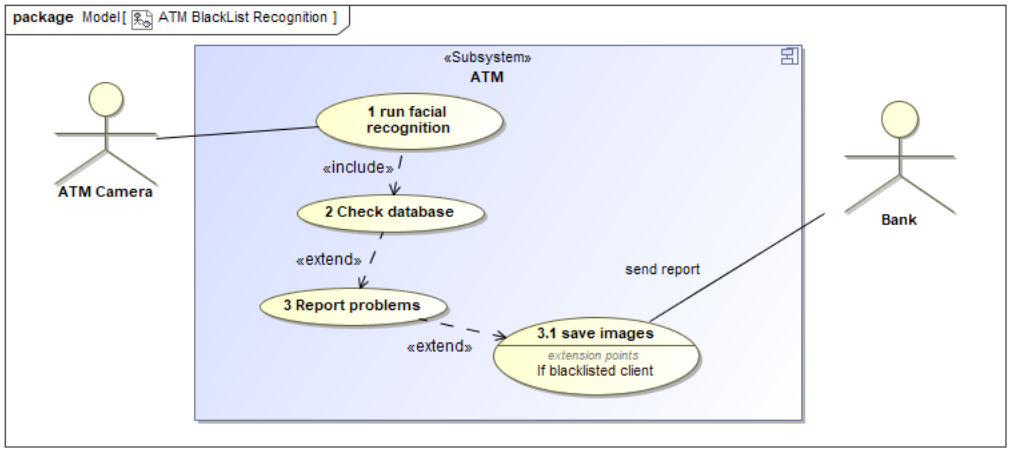
- **R03**: ATM InstaPrint
  InstaPrint can be done on the app or on the ATM interface itself. The client selects the account(s) they want statements for and can specify the time period(default is last 30 days). The ATM then prints the required statement(s).

Use Case 3



- **R04**: ATM Blacklist Recognition
  ATM Blacklist recognition is a system where each ATM will have a security camera attached to it that runs facial recognition on customers as they use the ATM and possibly people that are standing too close behind the current ATM user. If the person that is scanned is blacklisted then a report is sent to the bank and the ATM functions terminate. The camera should not be able to see anything on the ATM itself, example keypad, for security and privacy reasons.

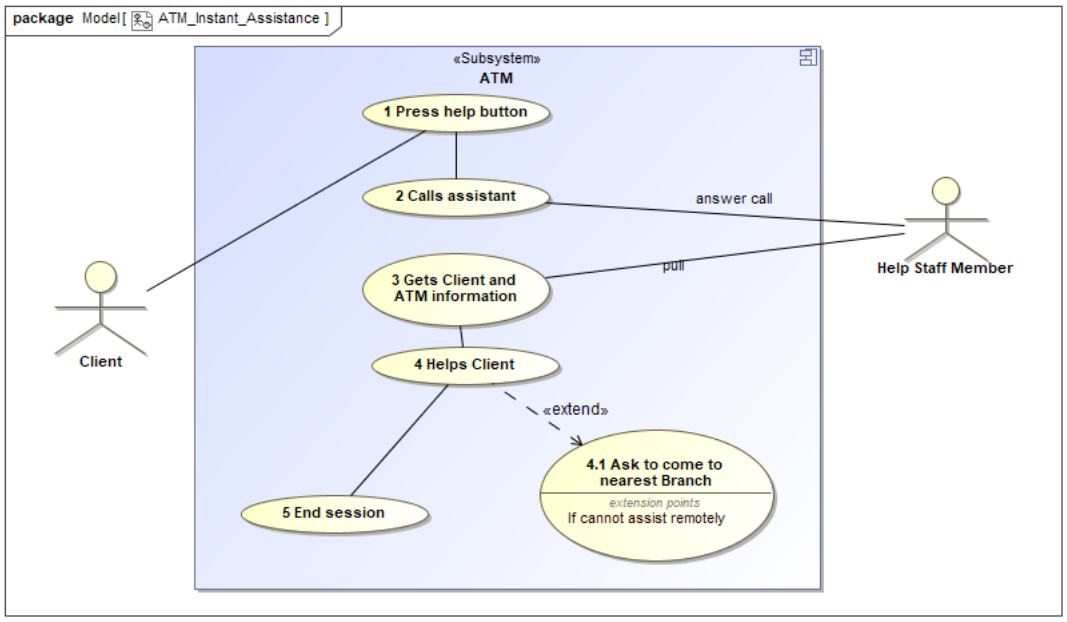
Use Case 4



- **R05**: ATM WiFi
  ATM WiFi is a medium range WiFi signal that will be broadcast from the ATM machine that allows connected clients to access the FNB banking app only.

- **R06**: ATM Instant Assistance
  Instant Assistance is a help button that will be available on the ATM that connects the client to the FNB help line. The staff member that the call reaches will be able to see the location of the ATM, the client(through the security camera) and what is currently on the screen without exposing any sensitive client information.

Use Case 5



- **R07**: Notifying users about offline ATM's
  The availability status of ATMs will be sent to the FNB app and if a client wishes to use an ATM it will notify the client which ATMs within a 10km radius of the client's device are offline and which are online. The app will have a tab on the app that shows the address of the offline ATM with a suggested nearest alternative for an online ATM.

4 Quality Requirements

- **ATM internet connection:**
  The ATM should have a fast enough internet connection to process transactions fast and effectively.

- **ATM WiFi:**
  The ATM WiFi connection should be fast to handle the amount of traffic it would have to allow especially at at peak hours.

- **ATM computational speed:**
  ATM's should ideally be able to dispense the cash fast and be able to process requested transactions instantly, not causing users to wait.

- **Audit logging:**
  The audit logging system on which all transaction are logged for auditing purposes should have large processing capabilities to ensure that transactions are processed as close to instant speed as possible to cope with peak hours of use.

- **Encryption:**
  All transaction information will be encrypted when being sent over the internet.

- **Geometric Interface:**
  The phone application, ATM and bank cards will have a stylish Geometric Interface with FNB's colour scheme to it to make it look appealing to the user.

- **Integration:**
  The new way of using ATM's will be easy to integrate into the old ATM system. The audit logging system is already up and running, but might need a performance boost to keep up with the increased speed of transactions. The old ATM interface will remain, but when the ATM scans an NFC chip linked to an account that has requested a transaction, will process the transaction hastily with the new system and its interface. Communications between the phone app and the banking system is already set up with the current FNB banking app, the new features will just be added on in an "ATM" tab in the app.

- **Usability:**
  The app will be very simple to use, using prompts that are fast and simple to respond to, with the user always being able to cancel a transaction on the app or go back in the chain of prompts to alter a choice.

- **Maintenance:**
  Once the new system is implemented, it should not need maintenance unless problems arise that users complain about, which will be fast to fix.

- **Usage stats:**
  Usage stats from the app and ATM regarding which prompts and tabs the users spend the most unnecessary time on will inform maintenance officers at the bank where people's time are being wasted. This will make it clear where the app needs updates and where the ATM interface needs updates. No personal information will be gathered, just statistics regarding the time of usage.

- **QR code scanner at vendors:**
  Merchant Vendors will need QR scanners. This is so that the Merchant Vendor can keep track of how cash is flowing within their business when they give out cash when a withdrawal is performed.

5 Trace-ability Matrix

Trace-ability Matrix					
Requirement	UseCase1	UseCase2	UseCase3	UseCase4	UseCase5
R01	X	X			
R02		X			
R03			X		
R04				X	
R05					
R06					X
R07					