University of Pretoria
Software Engineering - COS 301

New Generation ATM Requirements Specification

Group 6
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1 Introduction

1.1 Purpose

The system will create and revolutionize the way in which people use ATM's. It will create new and unique ways in which users can use and interact with the ATM's. This will lead to more secure, faster and cheaper ATM systems.

1.2 Scope

The aim of the project is to create a new ATM system and change how users interact with the ATM's and to reduce wait time at ATM systems and decrease cost to the financial institution. The way this will be achieved is by increasing the amount of ways in which people can use the ATM's such as QR codes and NFC chips.

The system will introduce various ways in which users may draw money with multiple factor authentication. The primary features will include:

- Withdraw money using NFC
- Withdraw money using QR codes
- Setting up banking operations using the financial institutions mobile application
- Printing bank statements at the ATM machines
- Facial recognition for security

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. User A 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 machine. The ATM will provide clear prompt on how he can complete the transaction in the most efficient way. However, this user can still do a Transaction on the dedicated mobile banking app and withdraw cash via a vendor.

2.2 User that has an NFC compatible device

The user will be able to complete the majority of his transaction on the ATM's dedicated mobile banking application. After completing his transaction on the app, he just has to scan his device at the ATM machine or scan a QR code with a vendor to complete and register his transaction with his bank. All information that this user needs will be found via prompts in the banking app.

2.3 Bank's maintenance personnel

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 is presented with a different display when he logs in with the administrator's password and is provided with options different from that of normal user. He has the authority to change or restrict various features provided by the software in situations of repairing.

2.4 Merchant Vendor

An affiliated vendor that is authorized by the bank to dispense cash to either User A or User B upon the successful scanning of a valid QR code from the dedicated mobile banking application.

3 Functional Requirements

3.1 Requirements

- **R01**: Withdraw cash using app with NFC or QR code.
  The client enters the withdrawal information on their phone through the FNB app(see R02 below) and if successful they can proceed to use the ATM.
  Once the client has reached the ATM (within the time limit), they tap the phone onto 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 PIN is correct then the withdrawal is successful and client receives the cash.
An electronic slip is sent to the clients app after the withdrawal.

- **R02**: Withdrawal system on app
  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. The client then selects the account to withdraw from and the amount of money they need. The app will generate options of different bill denominations from the amount required (availability of bills will be checked at ATM and will change automatically if some bills are unavailable). Client selects an option and is prompted to input their PIN for the bank card. If the PIN is correct, they can choose to generate a QR code to use at a store or to activate the NFC on the phone. If the PIN is incorrect, 3 retries are allowed before cancelling. 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 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 active on the user's screen for a maximum of 1 minute. If the user does not react, the transaction will cancel. (maximum 15 minutes wait time)

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

- **R04**: CCTV facial recognition
  Each ATM will have a security camera attached that scans 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. The camera should not be able to see anything on the ATM, example keypad, for security and privacy reasons.

- **R05**: ATM WiFi
  ATM stations will transmit a medium range WiFi signal that allows connected users access to the FNB banking app only. It should not be connected to the ATM system itself for security reasons.

- **R06**: ATM Help button
  A help button 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

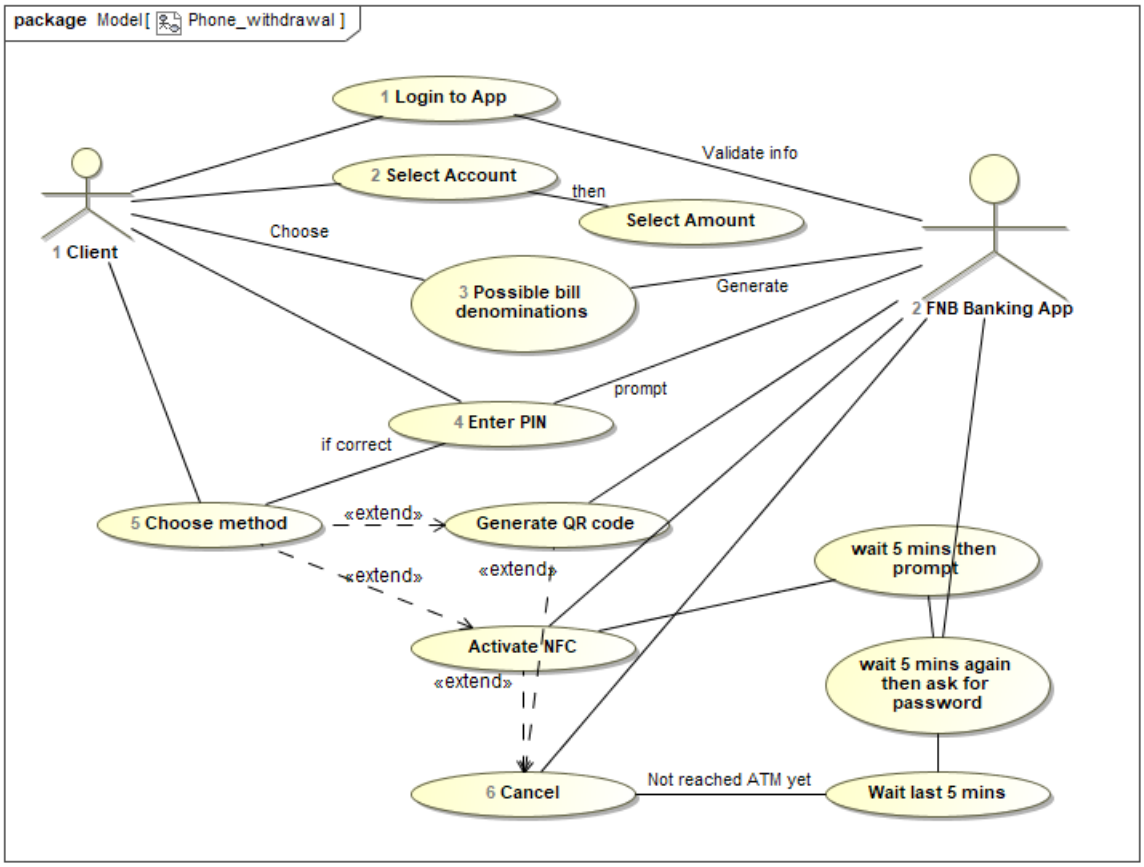
to see the location of the ATM, the client through the security camera and what is currently on the screen, without exposing any sensitive client information.

- **R07**: Checking balances
  Balances can be checked on the app. In the case of a user not having access to the banking app, balances can be checked at the ATM in the traditional way.

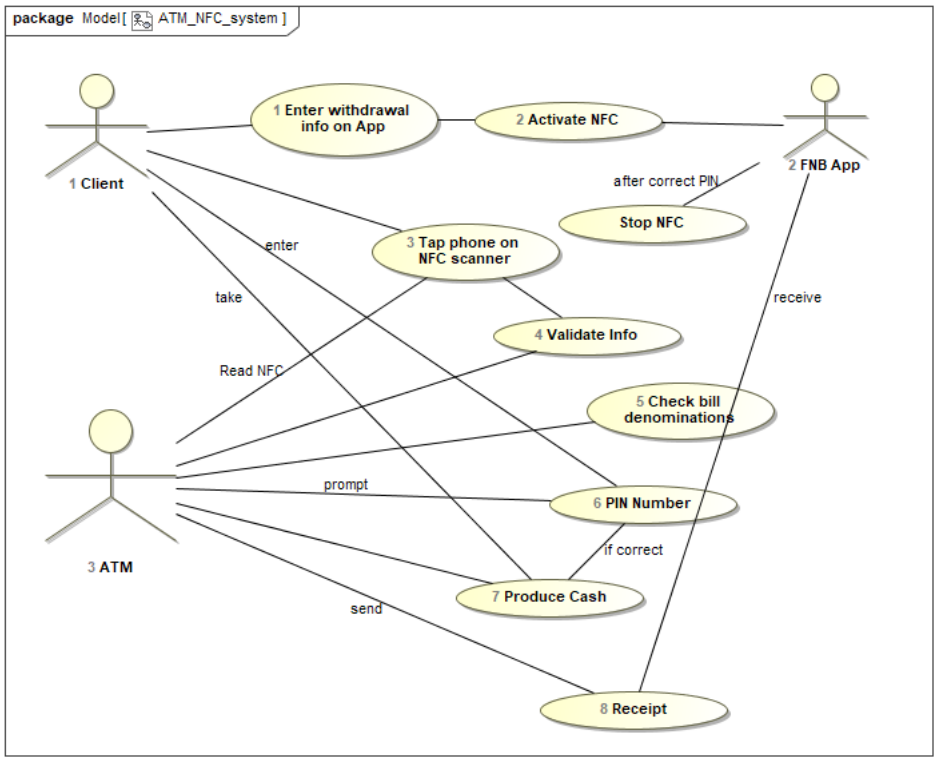
- **R08**: Notifying users about offline ATM's
  The app will notify users when an ATM is offline within a 10km radius of the user's device. This will be done simply by having a tab on the app that shows the address of the offline ATM with a suggested nearest alternative address of an active ATM.

3.2 Use Case Diagrams

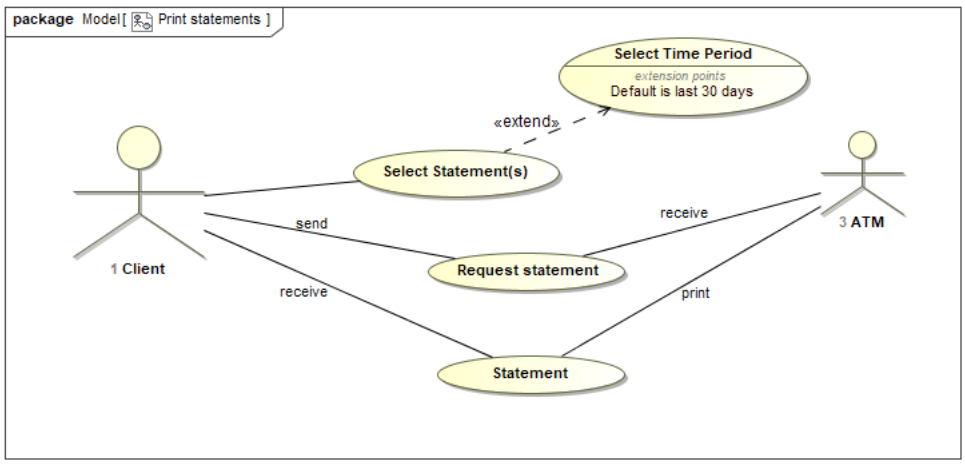
- Use Case 1:



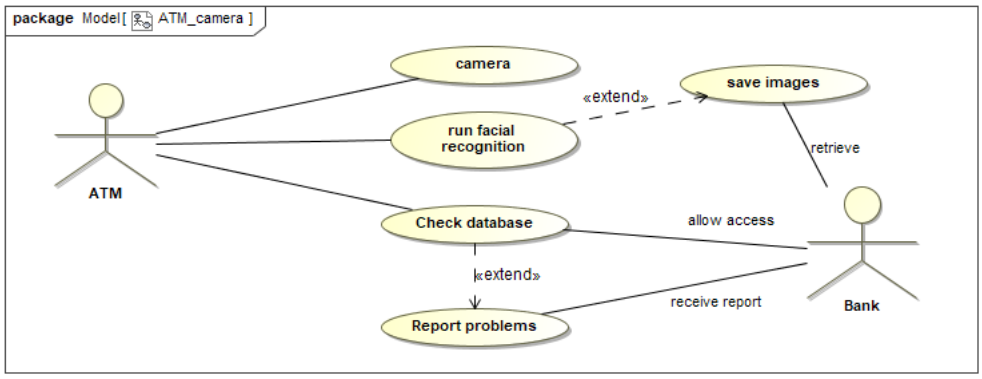
- Use Case 2:



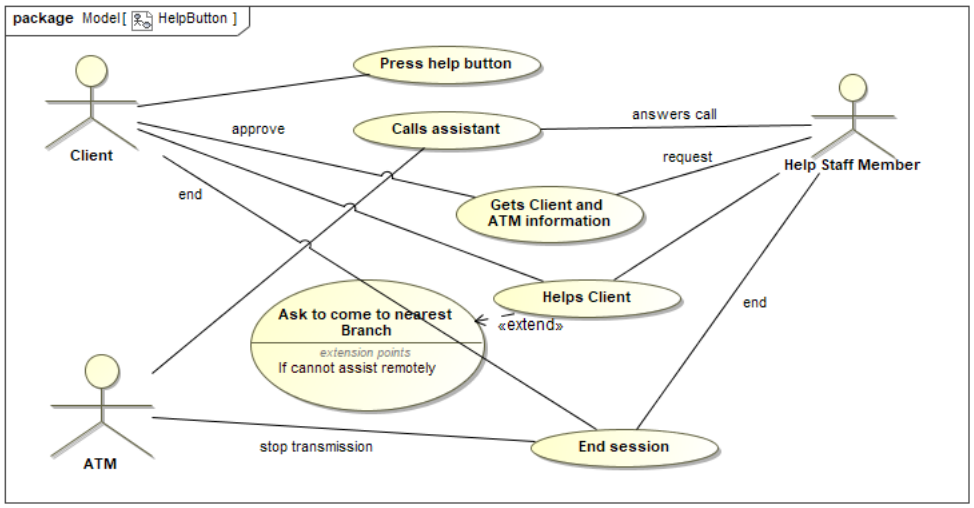
- Use Case 3:



- Use Case 4:



- Use Case 5:



4 Quality Requirements

1. ATM's internet connection: The connection that the ATM has to the internet should be a 10MB/s optic fibre internet connection to ensure that time is not wasted while interacting with the ATM. In remote places or mobile ATM's where a connection to a cellular network is necessary, 4G LTE would be ideal. Otherwise the fastest available connection.

2. WiFi speed at ATM: For optimal speed of use and throughput in the lines outside ATM's, a 10MB/s optic fibre connection for the people connecting to the WiFi signal at the ATM will be optimal to ensure queues move fast. The source of this connection will be shared with the ATM itself's own connection to the internet.

3. ATM: ATM's should ideally be able to dispense the cash fast and be able to process requested transactions instantly, not causing users to wait. They should have 99%+ uptime.

4. Backend mainframe: The backend mainframe on which all transactions are logged for auditing purposes should have large processing capabilities to ensure that transactions are processed as close to instant speed as possible, also to cope with peak hours of use. A fast database is required to accomplish this. The mainframe should have 99%+ uptime.

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

6. Cost: Concerning the cost of the high speed internet connections and database, the listed requirements are the ideal cases. If the client thinks that some of these requirements would cost too much, the client can use the client's own discretion on deciding where to cut costs.

7. Interface: The application, ATM and bank cards will have geometric shape background theme with FNB's colour scheme to it to make it look appealing to the user. This is considered a very modern and visually appealing design to use and should attract younger clients.

8. Integration: The new way of using ATM's will be easy to integrate into the old ATM system. The backend 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. 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.

9. 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.

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

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

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