COS301 Mini-Project Phase 1

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1 Introduction

1.1 Purpose

The purpose of this software requirements specification, is to define a system that can serve as a next generation ATM solution for First National Bank, our client. This solution will be able to handle a number of basic ATM functions, as well as certain administration tasks, while improving on the current ATM system by reducing the time users spend using it by, e.g. standing in queues and setting up transactions on the ATM itself. There is a business need for this project, as it will increase the amount of customers that can be services by a single ATM each day, as well as increase customer satisfaction by decreasing the time every customer needs to spend at a physical ATM to perform banking functions.

1.2 Scope

The FNB Next Gen ATM System will be a software system that interacts and integrates with the current ATM infrastructure that FNB uses, to enable users to set up certain key banking operations, such as cash withdrawals, cash deposits, balance enquiry and the generation of mini-statements, with all the needed information and options prior to reaching a physical ATM. The ATM will then be used as an authentication barrier between the user and their cash, by confirming that the user is the owner of the account in question, using NFC technology and 1 of an available 2 other authentication methods. This will reduce the amount of time users with NFC capable smartphones spend at the ATM, by reducing their interaction with the ATM to simply the time it takes to authenticate your identity, while still providing users that do not use these newer facilities with the capabilities of a current ATM. The Next Gen ATM system will also enable users to manage their account details in the same way, before authenticating their changes at an ATM. Additionally, the system should provide customers with the capability to see where there are physical ATMs nearby, and which ATMs might be offline. This functionality should double as a method for FNB to be alerted when an ATM goes offline, so maintenance can be performed. Lastly, users need to be able to

use the system to contact technical support staff if they need any assistance while using it.

1.3 Acronyms and Abbreviations

- FNB - First National Bank, our client.
- ATM - Automated Teller Machine, the system through which a bank's customer base can access and manage their accounts without being in a physical bank branch.
- FA (as in 2FA) - Factor Authentication, refers to the amount of authentication methods needed to access a personal account on the system, e.g. 2FA refers to 2 Factor Authentication which means that 2 different methods of authentication are needed before one can access an account.
- OTP - One Time Pin, used as an authentication method.

2 User Characteristics

When referring to customers in this section, the demographic roughly includes students between the ages of 16 and 25, as well as working men and women, that use FNB as their banking services provider.

- New Customer - New customers will use this system to register new bank accounts and perform any initial account management tasks, e.g. setting up a new pin code, on their NFC capable smartphone, before simply authenticating their identity at a physical ATM to complete the process.
- Current Customer - Current customers will use the system for day-to-day banking, through the use of four key banking interactions - cash withdrawals and deposits, balance enquiry and the generation of mini-statements. As stated earlier, these operations will be set up entirely, before reaching a physical ATM, on the customer's NFC capable smartphone, only needing the ATM for authentication and the actual retrieval of cash and generation of mini-statements. Current customers will also be able to request to be contacted by FNB technical support staff through their mobile application in case they need assistance with the system. They will be able to request to be contacted through one of several different mediums - video call, normal call or email. Customers will also be able to use the system to see where the nearest ATMs are, and which ATMs are inactive. The system will also enable current customers to withdraw cash from businesses that work with FNB in this venture, by using the system to generate a single-use authentication method to facilitate the exchange of money between the FNB customer's account and the business, so the business would act as an 'ATM'. Lastly, current customers will be able to manage their FNB bank accounts by opening new accounts, updating account details and closing accounts in the same manner that they would complete transactions.
- FNB Staff Members - FNB admin staff will also be able to create customer accounts, update customer account details and close customer accounts on behalf of customers or in situations where this is necessary according to FNB's current account regulations, terms and conditions.

- Technical Support Staff - Technical Support Staff will use the system to respond to customers who request assistance through their mobile applications by using the method that a customer specifies, in order to solve any problems or answer any queries.

3 Functional Requirements

3.1 Use Cases

Login Subsystem:

- 1.1 Request to Register
- 1.2 Request System Login
- 1.3 Present NFC Device
- 1.4 Register Finger Print
- 1.5 Scan Finger Print

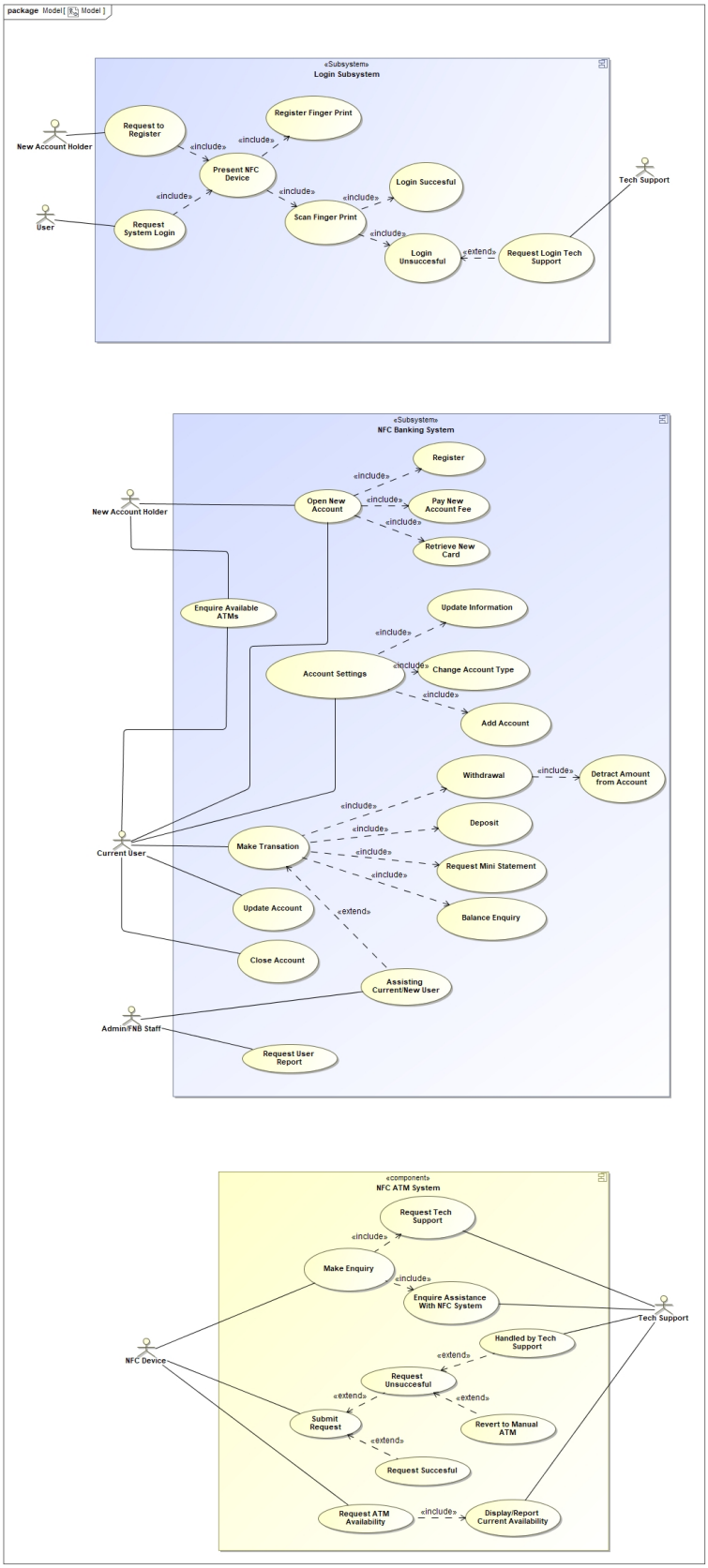
NFC Banking Subsystem:

- 2.1 Open Account
- 2.2 Update Account Information
- 2.3 Change Account Type
- 2.4 Add Account
- 2.5 Make Cash Withdrawal
- 2.6 Make Cash Deposit
- 2.7 Request Mini-Statement Generation
- 2.8 Enquire Account Balance
- 2.9 Provide User Assistance
- 2.10 Request User Report
- 2.11 Enquire Available ATMs
- 2.12 Close Account

NFC ATM Subsystem:

- 3.1 Make Technical Support Enquiry
- 3.2 Authentication Request Submission
- 3.3 Request ATM maintenance necessity

3.2 Use Case Diagram



4 Quality Requirements

4.1 Performance

- System must be very reactive to user input
- System must be able to exercise authentication with all of the authentication measures

4.2 Reliability

- System must have a 99% up-time
- System should use the back-up authentication factor if one of the first two fails

4.3 Scalability

- System must allow for integration of new ATMs and retail pay-points to app's ATM finder functionality

4.4 Security

- Authentication(For General Purpose)
  - The system must use 2 of 3 authentication measures to verify a users credentials, namely:
    - Biometrics (fingerprint)
    - NFC technology
    - A PIN
  - The system must require 2 of the authentication measures to validate a user.
  - System should have measures in place to encrypt biometric and PIN information
- Authorization(For Admin Users)
  - System must require 3 factor authentication for administrator access
    - Unique worker ID
    - Current password(Password is changed periodically)
    - OTP(One Time pin) sent to high ranking member of the system maintenance department
  - System must generate new admin password if current password is compromised

4.5 Maintainability

- System must routinely survey subsystems to anticipate failures and react to lowered performance
- Subsystems communication must only be limited to information necessary to complete a task

4.6 Monitorability

- System should report on:
  - Number of daily transactions.
  - Daily amount dispensed to users.
  - Daily amount deposited if ATM offers that functionality.
  - Current state of system and its subsystems.
  - Current capacity and if ATM needs replenishing.
- The system must log types of subsystem failures and level of severity.
- The system must monitor performance of subsystems and its internal environment to allow for less power usage in cases where the ATM is idle for long periods
- The system must have a "pulse" to let system admin know if ATM is still online.

4.7 Usability

- System must have a help function for users
- System must be simple enough for users to perform transactions effectively
- System must offer different language options for users

5 Trace-ability Matrix

Trace-ability Matrix			
Requirement Number	Login Subsystem	NFC Banking Subsystem	NFC ATM Subsystem
1.1	X		
1.2	X		
1.3	X		
1.4	X		
1.5	X		
2.1		X	
2.2		X	
2.3		X	
2.4		X	
2.5		X	
2.6		X	
2.7		X	
2.8		X	
2.9		X	
2.10		X	
2.11		X	
2.12		X	
3.1			X
3.2			X
3.3			X