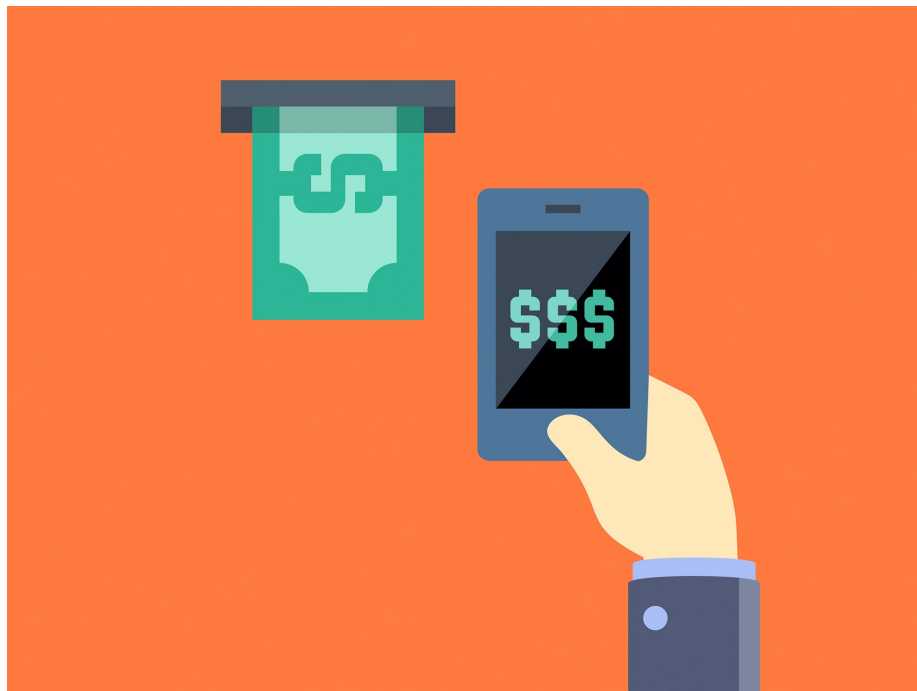


Software Requirements Specifications

Add

February 2019



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1 Introduction

Both the software and hardware of an ATM are becoming old and outdated. Currently an ATM is a computerized telecommunication machine to provide a means to allow customers to perform secure and safe financial transactions, in a public space with a user friendly interface that provides access to their personal bank accounts to perform such transactions.

The main purpose of this document is to specify the requirements and capabilities of the New Generation ATM. This document will provide the general characteristics of the intended users of the New Generation ATM. It will also provide a detailed description of the functionality of each of the functional requirement specified and also describe all the quality requirements which will be enforced to ensure quality of the New Generation ATM.

1.1 Purpose

The purpose of this SRS is to provide a detailed overview of the NGA by specifying the software system interface, External interface and the overall functionality of the New Generation ATM. The intended audience of this document are:

- Management of the bank.
- App developers.
- Developers for the new hardware,software and maintenance.
- Document writers.

1.2 Scope

The New generation ATM(NGA) is a mobile ATM which will be operated on the phone eliminating the need to use and depend on the normal ATM machine. The mobile ATM will allow a customer to be able to withdraw cash by using his/her phone to complete the transaction then tap on the machine box for the cash to come out. It will also allow the customer to deposit cash by completing the transaction on the mobile phone then only tapping the NFC reader embedded on the machine box to then insert the cash. It will also allow the customer to perform balance inquiry and also to view history of accounts. The main objective of the mobile ATM is ease of use , reducing time taken to perform banking transactions and avoiding long queues on normal ATMs.

The following document will apply to the NGA in terms of both hardware and software. The software facilitates the same functionality as a normal ATM but now on a smart phone with added features to allow various transactions within his/her account before doing the needed withdrawal and deposit at the machine/teller. The software allows for options such as cash withdrawals, balance transfers, deposits, inquiries, credit card advances and other related banking options.

The hardware to be implemented is essentially either a scanning system at tellers to read the necessary QR code, or the installation of a quick box system to allow an NFC chip to be scanned to allow a transaction of some sort to take place. The software will make use of already existing smart phone technology such as security in biometrics and two factor authentications.

1.3 Definitions, Acronyms

This section provides definitions of all items, acronyms and abbreviations to interpret the SRS document properly.

| | |
|-----------------|--|
| NGA | New Generation ATM |
| ATM | Automatic Teller Machine |
| SRS | Software Requirement Specification |
| User | A person who will be using the NGA |
| NFC | Near field communication |
| QR | Quick Response |
| application/app | The NGA software running on a smart phone. |
| FNB | First National Bank |
| SMS | Short Message Service |

1.4 Overview

This section describes how all the parts of the SRS are organized.

Introduction

This section provides an overview of the SRS and purpose of the NGA. It also provides acronyms and definitions for easy interpretation of the document and also references.

Overall Description

This section provides a summary of the functions of the NGA. It also describes the general characteristics of the intended users .

Functional Requirements

This section provides all the capabilities and functionality of the NGA system and also including a use case diagrams.

Quality Requirements

This sections provides necessary requirements for the system that are exterior to the system.

Trace-ability matrix.

This section provides a visualization of the allocation of the system requirements

to the subsystems.

2 Overall Description

2.1 Product perspective

Our NGA removes the need for plastic cards. Instead you will use a phone application with a two factor authentication system consisting of fingerprint and facial recognition to authenticate yourself as the user. From this point onward your phone application becomes the means by which you interact with your account and the ATM. The application will process the authentication and the transaction request, the ATM itself is only used as a way to finalize any withdraws and deposits.

1. The ATM is a dual functioning unit, providing the ability to withdraw and deposit cash.
2. A camera placed on the ATM will allow a consultant to view the user at the ATM, allowing for facial recognition if help is requested and also for general security and monitoring.
3. The NGA system will allow the user to manage their bank account remotely without the need to interact with the ATM.
4. The NGA has more functionality than simply providing an interface to view and interact with your bank balance, it also allows the user to convert currencies, transfer cash etc...
5. The ATM's hardware includes data drives, cash dispensers and receivers, cassettes, a networking port, an NFC reader, a small camera, speakers and a safe.
6. The ATM connects and communicates with FNB's network though a fibre optic or wireless internet connection depending on location.
7. The cassette capacity will be at least 2000 notes.

2.2 Product functions

The main functions of the **NGA** are:

1. **Cash dispense:** After the user has authenticated and made the request for a cash withdraw on their phone, they will place their phone (which consists of an NFC chip) onto the NFC reader which will process the transaction further and dispense the correct amount of cash.
2. **Cash deposit:** As above, once the user has authenticated, made a request and places their phone on the NFC reader, the ATM will open a cash deposit box where the user can place the cash. Thereafter the ATM will count the cash and make sure the user has placed the correct amount before further processing the transaction.

The main functions that the phone **application** performs are:

1. **Account creation:** A user can open a new account with FNB through the application.
2. **Account maintenance:** The application provides the normal basic functions of any banking software, including:
 - **Balances:** A list of your account balances can be viewed.
 - **Help:** Help functionality is included, allowing the user to either send an enquiry to the bank or to speak with a consultant directly.
3. **Transfer funds:** The user may use the app to either transfer funds between linked accounts or as a means to pay another individual by transferring funds into their account.
4. **Convert currencies:** The application has the functionality to convert foreign currencies into the Rand and vice versa.
5. **Purchase event tickets:** Buy event tickets using the application based on events around the users location.
6. **Pay expenses:** The application also allows the user to pay off any bills and expenses that are pending.
7. **Request loans:** The user will be able to request a loan from the bank through the banking application.

2.3 Design Implementation Constraints

The constraints that the project has are:

- The ATM must serve at most one person at a time.
- The minimum amount of money a user can withdraw is R100, the maximum amount of money a user can withdraw per session is R10 000 and the maximum withdraw allowed per day is based on user settings within the application.
- Before processing a withdrawal, the NGA application must first ensure that the user has sufficient funds in their account.
- The minimum amount of money a user can deposit is R100 and the maximum they can deposit is R10 000.
- For voice interactions, speakers should be present at the machine.
- For the facial recognition needed during a help session, a camera should be present at the machine.

2.4 Operating Environment

| Particulars | Client system | Server system |
|------------------|-------------------------------|----------------|
| Operating system | Android | Linux |
| Processor | Snapdragon 5 series and above | Pentium4, 2GHz |
| Hard disk | 40MB | 10TB |
| RAM | 256 MB | 100GB |

3 User Characteristics

3.1 Intended users

There are different kinds of users that will be interacting with our system. The intended users of the software are:

User 1

It will be a user with no smartphone. In this case this type of user will be using an SMS banking system. This system will be fairly simple to use since it will make use of USSD rail. Should the user fail to understand how it works, the nearest FNB bank will help them out.

User 2

It will be a user with a smartphone (experienced user). This type of user normally use ATM on several occasions and they are familiarized with online banking systems.

Maintenance Person

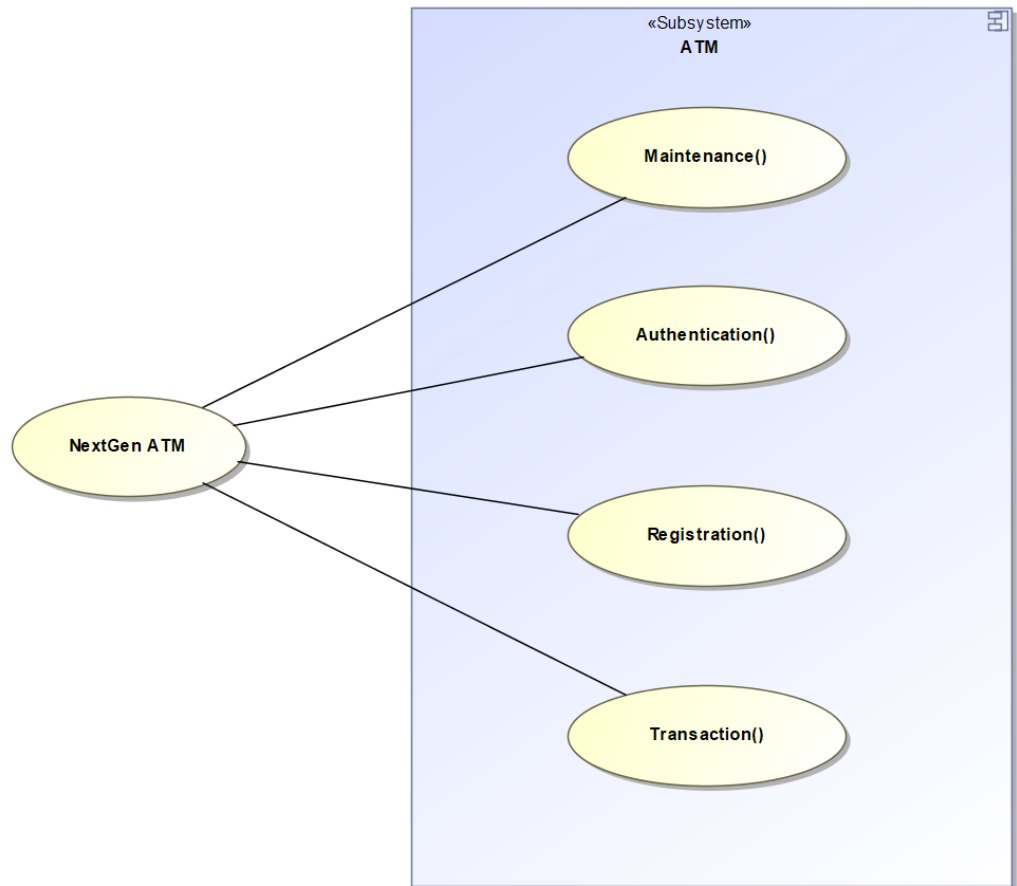
This user is the one who will maintain the FNB mobile application and the ATM itself. This user is in charge of repairing the system and storing cash into the ATM vault.

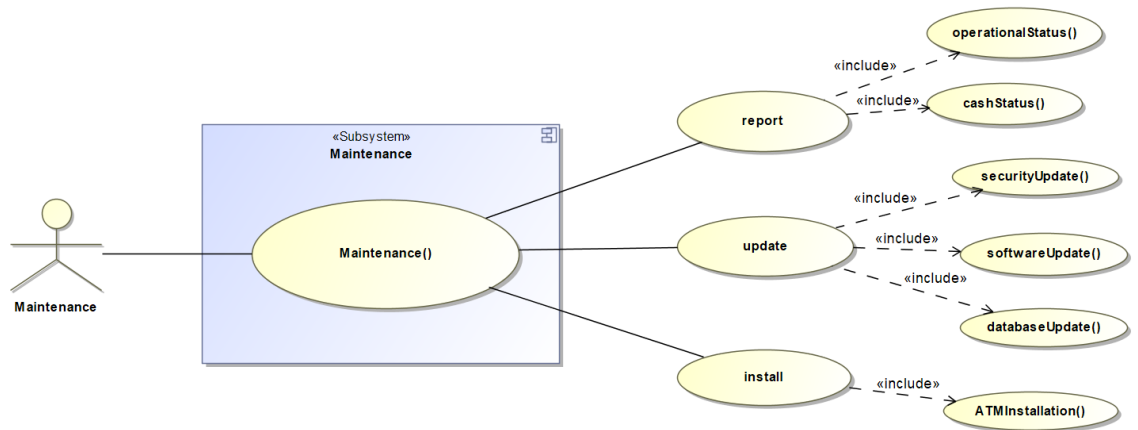
3.2 Constraints

1. When using the FNB mobile app, internet connectivity is required.
2. Only one person can use the ATM at a time.
3. Supported on Android platforms only.
4. Can only accept notes and not coins.
5. Can only deposit and withdrawal from participating vendors.

4 Function Requirements

4.1 Use-case



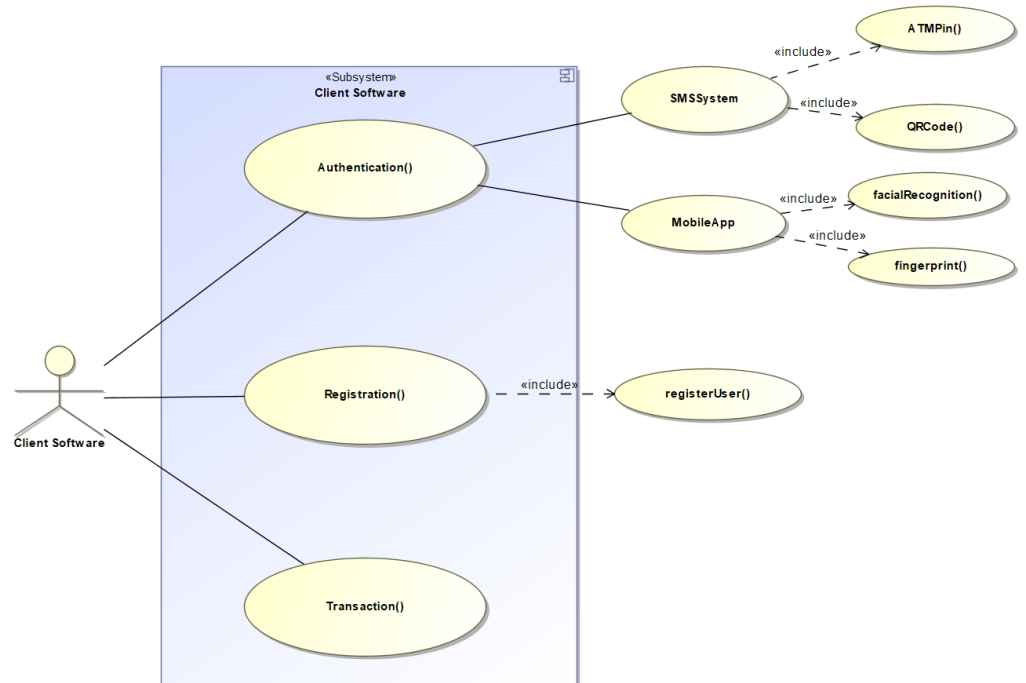


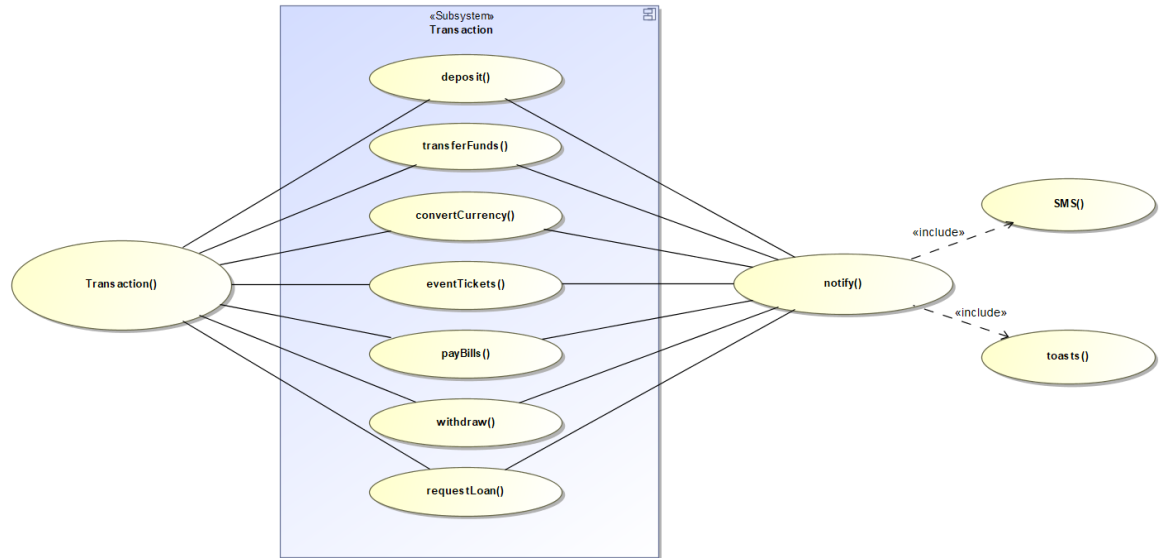
operationalStatus():

In maintenance the report includes operational status which explains if either the ATM or the servers are up and operational.

ATMInstallation():

This means to install the ATM and maintain them in case of a malfunction or refill.





The relationship between transaction subsystem and authentication subsystem is such that upon performing a desired transaction, one needs to authenticate (by means of biometric mediums respectively)

notify():

After the authentication for the transaction and the completion of the transaction, a notification will be sent to the user.

5 Functional requirements

R1: NGA must allow the customer to **register**.

R1.1 NGA must allow the customer to create an account.

R2: NGA must allow the customer to **authenticate**.

R2.1 NGA must allow the customer to authenticate using the SMSsystem.

R2.1.1 NGA must allow the customer to authenticate using the ATMPin.

R2.1.2 NGA must allow the customer to authenticate using the QRCode.

R2.2: NGA must allow the customer to authenticate using the MobileApp.

R2.2.1 NGA must allow the customer to authenticate using the facialRecognition.

2.2.2 NGA must allow the customer to authenticate using the fingerPrint.

R3: NGA must allow the customer to **perform transactions**.

R3.1 NGA must allow the customer to make a **deposit**.

R3.1.1 NGA must give the customer a notification.

R3.1.1.1 NGA must notify the customer using an SMS.

R3.1.1.2 NGA must notify the customer using a toast.

R3.2 NGA must allow the customer to **transfer funds**.

R3.2.1 NGA must give the customer a notification.

R3.2.1.1 NGA must notify the customer using an SMS.

R3.2.1.2 NGA must notify the customer using a toast.

R3.3 NGA must allow the customer to **convert currency**.

R3.3.1 NGA must give the customer a notification.

R3.3.1.1 NGA must notify the customer using an SMS.

R3.3.1.2 NGA must notify the customer using a toast.

R3.4 NGA must allow the customer to **purchase event tickets**.

R3.4.1 NGA must give the customer a notification.

R3.4.1.1 NGA must notify the customer using an SMS.

6 Traceability Matrix

| | Transaction subsystem | Authentication subsystem | Maintenance subsystem | Registration subsystem |
|---------------------|-----------------------|--------------------------|-----------------------|------------------------|
| R1 | | | | |
| R1.1 | | | | × |
| R2 | | | | |
| R2.1.1 - R2.1.2 | | × | | |
| R2.2.1 - R2.2.2 | | × | | |
| R3 | | | | |
| R3.1 | | | | |
| R3.1.1 | | | | |
| R3.1.1.1 - R3.1.1.2 | × | | | |
| R3.2 | | | | |
| R3.2.1 | | | | |
| R3.2.1.1 - R3.2.1.2 | × | | | |
| R3.3 | | | | |
| R3.3.1 | | | | |
| R3.3.1.1 - R3.3.1.2 | × | | | |
| R3.4 | | | | |
| R3.4.1 | | | | |
| R3.4.1.1-R3.4.1.2 | × | | | |
| R3.5 | | | | |
| R3.5.1 | | | | |
| R3.5.1.1 - R3.5.1.2 | × | | | |
| R3.6 | | | | |
| R3.6.1 | | | | |
| R3.6.1.1 - R3.6.1.2 | × | | | |
| R3.7 | | | | |
| R3.7.1 | | | | |
| R3.7.1.1 - R3.7.1.2 | × | | | |
| R4 | | | | |
| R4.1 | | | | |
| R4.1.1 - R4.1.2 | | | × | |
| R4.2 | | | | |
| R4.2.1 - R4.2.3 | | | × | |

7 Quality Requirements

QR1: Performance

QR1.1 The ATM will be available 24/7 to the customers.

QR1.2 On the FNB mobile app, transactions can be performed anytime and anywhere, as long as you have internet connection.

QR2: Reliability

QR2.1 All the databases related to the FNB mobile app should be cloud-hosted databases. The cloud computing services are able to perform automatic failure recovery and use the idea of parallel computing approach that also improves reliability of the system.

QR3: Security

QR3.1. In the authentication subsystem we have used fingerprint scanning and facial recognition to enforce security which processing with the desired transaction.

QR3.2 The ATM will have a real time monitoring mechanism such that it will have a security camera and an intercom device should a customer require help.

QR3.3. In case when the user is going to use the SMS system in order to withdraw money or perform any other transaction, one will get a QR code that will be scanned at the closest retail shop. After providing QR code a pin code will be send to the user in order to prove user's ownership of that bank account .

QR4: Scalability

QR4.1 All the databases related to FNB mobile app should be cloud-hosted databases. That integration to cloud-hosted databases will increase scalability, as cloud-hosted databases have the ability to resize storage capacity.

QR4.2 This FNB mobile app will be scalable across all the android platform (including the latest version as well). In future it shall be developed for iOS platform too.

QR5: Flexibility

QR5.1 Any type of transactions you desire to perform is done via FNB mobile (but this requires you to have internet connection). Moreover, the ATM is at your service 24/7, no need to carry ATM card and it supports international customers as well in terms of converting specific currency to its relevant Rand amount.

QR6: Maintainability

QR6.1 The FNB mobile app will be maintained and updated periodically(for instance it will check for malicious threats and also update existing features with the new ones.

QR6.2 Periodically maintaining the backup of all the accounts of the customers for security purpose.

QR7: Monitorability

QR7.1 The FNB mobile app monitorability will be done by the maintenance team. On periodically basis they will monitor, update, upgrade (supporting features) and maintain it. If any changes needs to occur in the entire application, then a report needs be made with supporting statements as why should the change occur. This report will be submitted to the superior.

QR7.2 At the ATM there will be an virtual assistant available who will help the clients as well as monitor and take necessary actions should there be a sign of danger to the client.

QR8: Integrability

QR8.1 The overall FNB mobile system(app) will be constructed from more specialized, stand-alone, subsystems. Each subsystem will perform its own functionality. System will include the following subsystems: Transaction, Registration, Authentication and Maintenance subsystems.

QR8.2 FNB mobile system will be integrated with biometric systems that are embedded in most of devices to perform Authentication subsystem functionalities, like facial recognition and fingerprint authentication.

QR9: Cost

QR9.1 Biometric systems that are already exist in majority of devices will be integrated into FNB mobile app. That will decrease the cost to produce the

FNB mobile app, as there will be no need to design own biometric system.

QR9.2 FNB mobile app will do the most of steps for cash withdrawal, thus physical ATMs' design can be simplified. The only function that a physical ATM should perform will be cash landing. That will decrease the actual price and maintenance of a physical ATM.

QR9.3 It will result in more expenses to integrate FNB databases to hybrid cloud infrastructures in order to increase scalability of the FNB mobile app.

QR10: Usability

QR10.1 The overall interface of the FNB mobile app will be simple (no clustering of information) and will be intuitive to use since there would be supporting icons of relevant functionality making it easy for users to use the app.

QR10.2 There should be interaction between FNB app and a user. That means that app should respond to any sort of interaction/action made by user. The response will be done through notifications, by using toasts as a response to minor acts and SMS system for some major acts, like completion of transactions or proof of payment.

8 Conclusion

By incorporating the NGA, FNB will open an opportunity to its clients for a new, faster, easy, secure and more reliable way of cash withdrawal and performing other banking transactions. The NGA will also decrease the costs that would be spent on purchasing and maintaining of the current ATMS.

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