SMS-BASED AUTHENTICATION FRAMEWORK FOR A JOINT ACCOUNT ATM TRANSACTION.

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A Thesis submitted to the Institute of Postgraduate Studies and Research in partial fulfilment for the requirements of the Degree of Master of Science in Information Technology of Kabarak University.

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KABARAK UNIVERSITY

DECLARATION

This thesis is my original work and has not wholly or in parts been presented for the award of degree at Kabarak University or any other university.

Signature……………………………   **Date…………………………………..**

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RECOMMENDATION

This research thesis entitled: **"SMS-Based Authentication Framework for a Joint Account ATM Transaction"** written by **Evans Kimutai Chesang** is presented to the Institute of Postgraduate Studies and Research of Kabarak University. As the official university supervisors, we have reviewed this research thesis and recommend it to be accepted in partial fulfilment for the requirements of the Degree of Master of Science in Information Technology of Kabarak Univerrsity.

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ACKNOWLEDGEMENT

DEDICATION

I dedicate this work to all scholars seeking to use research innovations in Information Technology to provide sustainable solutions that address inequalities in society.

ABSTRACT

Information and Communication Technology (ICT) has transformed the way people conduct business today. The banking industry has not been left behind in the utilization of ICT to provide alternative banking channels. Competition for customers and customer expectations have pushed various industry players to acclimatize emerging technologies, as well as innovative alternative service delivery channels, to gain a competitive advantage in the provision of financial services beyond the traditional bank branch channel. Automated Teller Machines have for a long time been used to provide an interactive access of information, between banks and clienteles in addition to financial services at anytime, anywhere without compromising on the confidentiality, integrity and availability of financial/Customer information. However, these channels are susceptible to the threats and risks associated with interbank networks, such as cybercrimes. Fraudsters and cyber criminals have taken advantage of the vulnerabilities in the interbank networks, to steal from unsuspecting clients. To minimize the risks of financial loss associated with ATM transactions, an enhanced authentication framework is inevitable and must be implemented to safeguard financial institutions' reputation. This study, therefore, seeks to propose a strong authentication framework that combines the conventional two factor authentication with the GSM (Global System for Mobile Communication) mobile technology. The two factor authentication takes into account what the person knows (PIN) and what the person has (Card), with an SMS-based authentication framework for a joint account ATM transaction, for those joint account holders issued with an ATM card and a PIN. A prototype shall be developed to provide a simulation for the actual transactions and ascertain the strength of the proposed authentication framework.

Keywords: SMS, Authentication framework, Transactions, ATM, Mobile Technology.

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ABBREVIATIONS

ADCs	Alternative Delivery Channels
ATM	Automated Teller Machine
CIA	Confidentiality Integrity Availability
PIN	Personal Identification Number
SMS	Short Message Service
CAGR	Compound Annual Growth Rate
POS	Point of Sale
FICO	Fair Isaac Corporation
EMV	Euro pay, MasterCard, and Visa
US	United States
FFIE	Federal Financial Institutions Examination Council
IADs	Independent ATM Deployer
ISP	Internet Service Providers
CRT	Cathode Ray Tube
LCD	Liquid-Crystal-Display
GSM	Global System for Mobile Communications
IM	Instant Messaging
VoiP	Voice over Internet Protocol
SMSC	Short Message Service Center
SME	Short Message Entity
PKF	Pannell Kerr Forster
CCTV	Closed-Circuit Television
KCB	Kenya Commercial Bank
USIU-A	United States International University for Africa
SEPA	Single Euro Payment Area
EAST	European ATM Security Team

DEFINITION OF OPERATIONAL TERMS

Framework – This is a layered structure indicating what kind of programs can or should be built and how they would interrelate.

Authentication - This is the process of determining whether someone or something is, in fact, who or what it is declared to be.

ATM - It is an electronic banking outlet, which allows customers to complete basic transactions without the aid of a branch representative or teller.

Transaction - Refers to a sequence of information exchange and related work that is treated as a unit for the purposes of satisfying a request and for ensuring database integrity

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Automated Teller Machine (ATM) is an electronic machine that operates like a bank teller by accepting cash deposits and dispense to and from a bank account holder. The evolution of Automated Teller Machine was not in isolation, rather as a result of the general global wave in the technological revolution (Kathleen, 2005). Therefore, the ATMs were as a result of a need to respond to the challenge of the multiple bulk of daily complex information that arises from among others; increase in competition, increased customer demand for both service provision as well as efficiency, expansion due to the increase in demand for services among others. This enhanced efficiency in financial service provision as well as the convenience of access to cash and information at anytime, anywhere.

The history of ATMs dates back to the year 1967, when Barclays Bank (UK) introduced the first Automated Teller Machine (ATM) in the world (Barclays, 1982), while IBM introduced the magnetic stripe plastic cards in 1969 (Bátiz-Lazo, 2001). Together these innovations marked the birth of electronic banking. Barclays introduced credit cards to the UK by importing systems (including computer applications) from Bank of America (US) at the end of 1965. Barclay's early adoption of ATMs was no coincidence because cash withdrawal through ATMs is a major use for credit cards. Indeed, the emergence of the ATM marked the beginning of self-service banking as services provided by the bank teller could be performed on a 24-hour schedule and at the customers' convenience rather than during banking hours (Bátiz-Lazo, 2001).

ATMs have components such as Central Processing Unit (CPU) user interface and transaction devices, magnetic or Chip card reader for identifying the customer, a display screen which is used by the customer for performing the transaction, function buttons usually close to the display or a Touch screen used to select the various aspects of the transaction and a record printer which provides the customer with a record of a transaction (Cronin and Mary, 1997).

Most Automated Teller Machines are connected to interbank networks, enabling people to withdraw and deposit money from machines not belonging to the bank where they have their

account or in the country where their accounts are held thus enabling cash withdrawals in local currency (Maxwell, 1990).

Transactions done on ATMs must be authenticated to prevent frauds. This is done by providing a personal identification number (PIN) that is assigned to every ATM card. Upon inserting the card in the ATM terminal and keying in the right PIN, the ATM is then permitted to complete the transaction either by dispensing cash, accepting deposits, transferring funds or providing information on account balances. However, for two people running a joint account issued with a PIN and an ATM card, authentication becomes a more complex topic to address. A proper authentication framework must be in place to guarantee secure transactions without exposing both the financial institution and the account holders to any form of security risk and fraud. The proposed study therefore aims at providing a better framework to handle the challenges faced by joint account holders without compromising on the security of transactions or the bank's reputation.

1.2 Problem Statement.

The enforcement of transactions authentication framework for a joint bank account operated by individuals issued with an ATM card is not currently in place. The current arrangement is that clients who operate a joint account are issued with one ATM PIN and it's upon them to manage their ATM transactions using a local arrangement, whereby one signatory must notify the other of the intention to transact using the ATM. They must arrive at a consensus otherwise both signatories must have to be present at the location of the ATM terminal to confirm the transaction. This kind of arrangement is time consuming and causes lots of inconveniences. Financial accountability and transparency is hardly achievable and may become a recipe of conflicts between account holders. PIN sharing and disclosure is a security risk that may result in transaction frauds. However, these challenges can be addressed if a proper authentication framework for a joint account was made available. Such a framework should then guarantee secure ATM transactions for the account holders without exposing both the financial institution and the account holders to any form of security risk and fraud. The proposed framework in this study, therefore, is meant provide a better suitable and a more convenient ATM transactions authentication for both joint account holders as well as individual account holders. The proposed

SMS-based authentication framework for ATM transactions that combines two factor authentication; ATM card and PIN with an additional authentication using an SMS shall adequately address the challenges faced by joint account holders without compromising on the security of the transactions and the reputation of the financial institution.

1.3 Objectives

The overall objective of the proposed study is to come up with an authentication framework for a bank joint account. In addition, a prototype that utilizes an SMS-based authentication for ATM transactions involving a joint account operated by two individuals issued with an ATM card will also be developed and tested.

The specific objectives covered by this study are:

i. To develop an SMS-based authentication framework accompanied by a prototype for ATM transactions involving joint accounts operated by two individuals issued with an ATM card.

ii. To evaluate the performance of the prototype developed for the SMS-based authentication framework for ATM transactions involving joint accounts to ascertain its workability.

iii. To establish the feasibility of implementing the proposed authentication framework and the prototype by service providers offering joint account services.

1.4 Research Questions

The study shall seek to address:

i. What are the requirements for the development of a prototype for the proposed SMS-based authentication framework proposed by the study?

ii. What is the evaluation criterion of the developed prototype for SMS-based authentication framework for ATM transactions involving a joint account operated by two individuals issued with an ATM card?

iii. Can the proposed SMS-based authentication framework for ATM transactions involving a joint account operated by two individuals issued with an ATM card be recommended to service providers for implementation?

1.5 Significance of the study

An SMS-based authentication framework for ATM transactions involving a joint account operated by two individuals issued with an ATM card is not currently implemented. Therefore, an authentication framework such as the one proposed in this study shall be of great significance to financial institutions and individuals having a joint account. This because all ATM transactions involving such joint accounts can easily be subjected to authentications using both two factor authentication and an SMS, minimizing frauds and financial loss. Individual account holders may at the same time subscribe to this kind of authentication framework and may not have to destroy their ATM PINs every time they are issued with ATM cards as is the case at the moment whereby clients are advised to memorize and destroy their ATM PINs as soon as they are issued with them, due to security reasons. Instead they can keep both their PINs and ATM cards together since no such ATM transactions can be effected by anyone without the account holder's authentication through their mobile phones. This curbs on fraudulent ATM transactions, minimizing the security risks of financial loss or banks losing credibility.

Besides the proposed study shall also contribute to the body of knowledge and may therefore be used by scholars and researchers as a reference material in future research.

1.6 Expected outcome

The expected outcome of the study shall be as follows:

i.   An SMS-based authentication framework for ATM transactions involving a joint account operated by two individuals issued with an ATM card.

ii.   A prototype developed to test the implementation the SMS-based authentication framework for ATM transactions involving a joint account operated by two individuals issued with an ATM card.

iii. Recommendations to service providers for adoption of the authentication framework.

1.7 Scope of the study

The study will focus on the development of an SMS-based authentication framework for ATM transactions involving a joint account operated by two individuals issued with an ATM card. A prototype for the proposed framework will also be developed to simulate the transactions' environment for the purpose of evaluating the performance of the proposed authentication framework.

1.8 Assumptions

Assumptions made for the study are:

i. That financial institution shall provide information related to fraudulent ATM transactions and the ATM system's vulnerabilities exploited by fraudsters.

ii. That financial institution shall provide some joint account information for purposes of the study.

iii. That mobile network operator shall provide SIM cards for use in analysing results of the SMS-based authentication framework for ATM transactions involving a joint account operated by two individuals issued with an ATM card

1.9 Conclusion

In Chapter 1, the researcher introduced and explained the primary area of focus in this study. The background of the study gives a brief history of the ATM machine and explains that the innovation was as a result of a need to respond to the challenge of increased customer demand for service provision. This enhanced efficiency in financial service provision as well as the convenience of access to cash and information at anytime, anywhere. The study further highlighted on the problem statement in that enforcement of transaction authentication framework for a joint bank account operated by individuals issued with an ATM card is not currently in place, and therefore this research seeks to address this shortcoming by proposing an SMS-based authentication framework for a joint account ATM transaction.

The chapter also addressed both the research objectives and the research questions for the study. The section on the significance of the study explains with the implementation of the research proposal, all ATM transactions involving joint accounts issued with an ATM card and PIN can

easily be subjected to authentication using both two factor authentication and an SMS, minimizing frauds and financial loss. Besides that, the proposed study shall also go a long way in contributing to the body of knowledge and may therefore be used by scholars and researchers as a reference material in future research.

Lastly, the chapter explains the expected outcome of the study, which will be a prototype to be designed, tested and evaluated to ascertain whether its performance addresses the research objectives and research questions of the proposed SMS-based authentication framework. The scope of the study, assumptions made by the research proposal and the definition of terms concluded the highlights of the chapter 1.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This chapter presents a discussion on the authentication frameworks employed in ATM transactions (current ATM framework), SMS-based authentication frameworks and conceptual framework for the study.

2.2 Authentication

According to Global Financial Outlook 2015, financial institutions have provided different alternative service delivery channels to meet the ever rising dynamic customer demands. These channels must have in place robust, effective and reliable methods to authenticate customers. An effective authentication system is necessary for compliance with requirements to protect customer information, to prevent money laundering and terrorist financing, minimize frauds, eliminate identity theft, and promote the legal enforceability of agreements and transactions. The risks of doing business with incorrectly identified persons using these alternative service delivery channels such as ATMs, internet banking, mobile banking among others can result in financial loss and reputation damage through fraud, disclosure of customer information, corruption of data, or unenforceable agreements (Ibitola, 2013).

The guidance on authentication in internet banking (FFIEC 2005) explains that for a positive authentication, the elements from at least two authentication factors or preferably all three authentication factors should be verified for any transaction to be executed. The three authentication factors are: The knowledge factors - Something the user knows for example a Personal Identification Number (PIN). The ownership factors - Something the user has for example an ATM card. The inherence factors - Something the user is for example biometrics.

Two factor authentication mechanisms can also be achieved using a mobile whereby the phone works as a software token for One Time Password generation. The generated One Time Password is valid for only a short user defined period of time and is generated by factors that are unique to both, the user and the mobile device itself. Additionally, an SMS-based mechanism is implemented as both a backup mechanism for retrieving the password and as a possible mean of synchronization (Aloul, Zahidi, El-Hajj, 2009).

Therefore, there is need for a highly secure authentication mechanism. Selvaraju and Sekar (2010) proposed an embedded Crypto-Biometric authentication scheme for ATM banking systems. In this scheme, cryptography and biometric techniques are fused together for person authentication to ameliorate the security level. The fingerprint template including singular points, frequency of ridges and minutiae are stored at the central banking server during enrolment. At the time of transaction fingerprint image is acquired at the ATM terminal using high resolution fingerprint scanner. The fingerprint image is enhanced and then encrypted using 128 bit private key algorithm. The encrypted image is then transmitted to the central server via secured channel. At the banking terminal the image is decrypted using the same key. Based on the decrypted image, minutiae extraction and matching are performed to verify the presented fingerprint image to ascertain if they belong to the user. The authentication is signed if the details matching are successful.

Financial institutions and ATM vendors have continued to innovate complex but easy to use authentication mechanism for secure ATM transactions. Conventionally ATM cards and PINs, both of which constitute a two factor authentication mechanism, have been used over the years. They have proved to be unsecure (Luvanda, 2014).

Globally, Automated Teller Machines have been adopted and are still being adopted by banks. They offer considerable benefits to both banks and their depositors. The machines can enable depositors to withdraw cash at more convenient times and places than during banking hours at branches (Phan and Nham 2015). In addition, by automating services that were previously completed manually, ATMs reduce the costs of servicing some depositors of demand. These potential benefits are multiplied when banks share their ATMs, allowing depositor of other banks access their account through a bank's Automated Teller Machine. Moya, Balunywa and Nanyuma (2010) explains that the adoption of ICT in banks has produced largely positive outcomes such as improved customer services, more accurate records, ensuring convenience in business time, prompt and fair attention, and faster services etc. Also, the banks' image is improved creating a more competent market. Work has also been made easier, and more interesting, the competitive edge of banks, relationship with customers, and the solution of basic operational and planning problem has been improved

2.3 The Current ATM System Framework

Conventionally an ATM machine needs a data terminal with two inputs and four output devices and the availability of a host processor. The host processor is necessary so that the ATM can connect and also communicate with the person requesting the cash. The Internet Service Provider (ISP) also plays an important role in this action. They act as the gateway to the intermediate networks and also the bank computer. The host processor is mainly owned by the bank. It can also be owned by an ISP. If the host is owned by the bank only machines that work for that particular bank will be supported.

2.4 The Components of the Current ATM System

There are mainly two input components and four output components for an ATM system. The input components are:

(i) **Card Reader-**This is a part of the identification of your particular account number. For this the magnetic stripe on the back of the ATM card is either swiped or pressed on the card reader so that it captures your account information. To understand the account information of the user, the data from the card is passed on to the host processor. The host processor thus uses this data to get the information from the card holder's bank.

(ii) **Keypad-**After the card is recognized, the machine asks further details like the type of withdrawal you prefer, your balance enquiry, and your personal identification number (PIN) and so on. Since each card has a unique PIN number, there is very little chance for someone else to withdraw money from your account. There are also separate laws to protect the PIN code while sending it to the host processor. So, the PIN number is mostly sent in encrypted form.

There are mainly four output components:

(i) **Speaker-**When a particular key is pressed, the speaker provides the feedback as audio.

(ii) **Display Screen-**The questions asked by the ATM machine regarding the transaction and the input from the user is all displayed on the display screen. Each step of withdrawal is

shown by the display screen. A CRT screen or even an LCD screen is commonly used as an LCD screen.

(iii) **Receipt printer-**All the details regarding your withdrawal like the date and time and the amount withdrawn and also the balance amount in the bank is also shown in the receipt. Thus a paper receipt of the current transaction is obtained by the user.

(iv) **Cash dispenser-**This is the central system of the ATM machine. This is from where the required money is obtained. From this portion the person can collect the money.

As shown in the diagram below, the current system framework is a combination of three sections:

(i) **The end user section** – this is the section where the account holder interacts with the ATM machine terminal, either to make enquiries or transact. He uses the ATM card and the PIN assigned to perform a transaction. Card and PIN offers a two factor authentication for ATM transactions.

(ii) **The ATM section** – this is the section that contains the ATM machine terminal that accepts card and PIN and validates it with the bank account details before allowing a transaction.

(iii) **The Financial Institution section** – This is the bank holding all the client accounts and databases associated with the accounts.

2.4.1 The Current ATM framework
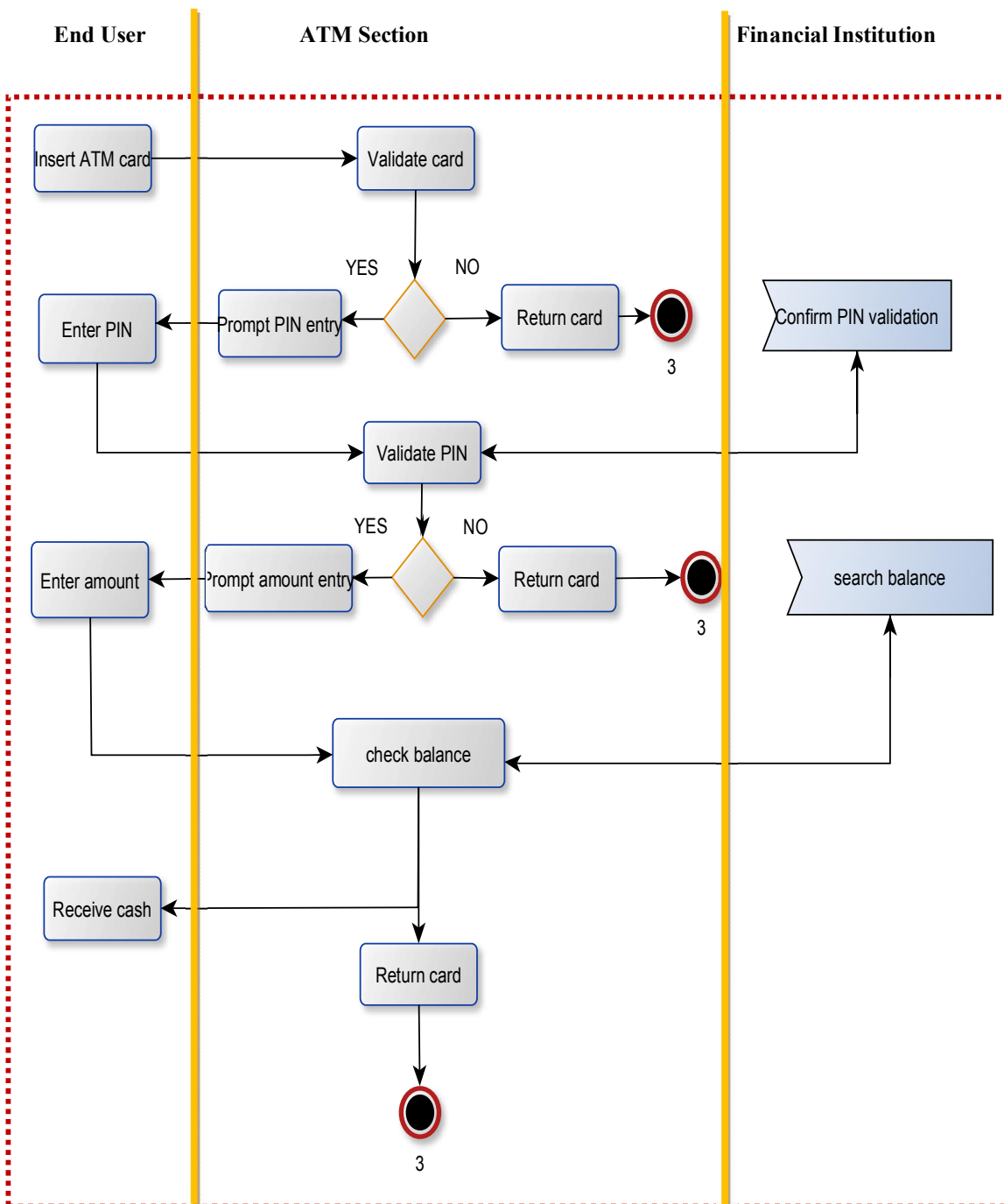
Figure 1: A conventional ATM system framework adopted from embarcadero.com (2013).

2.5 Short Message Service (SMS)

Short Message Service (SMS) can be described as the most basic communications technology used to exchange data between devices in a network managed by mobile service providers/operators. The content of SMS is usually short and alphanumeric of up to 140 bytes

(1,120 bits) of data, which allows a 160-character alphanumeric message in the default 7-bit alphabet or a 70-character message in a non-Latin language like Chinese. SMS provides a convenient and flexible means through which people can communicate or execute business transactions. It provides a seamless low cost communication to multiple users with mobile phones in networks owned and managed by different mobile service operators (Dholakia, 2002).
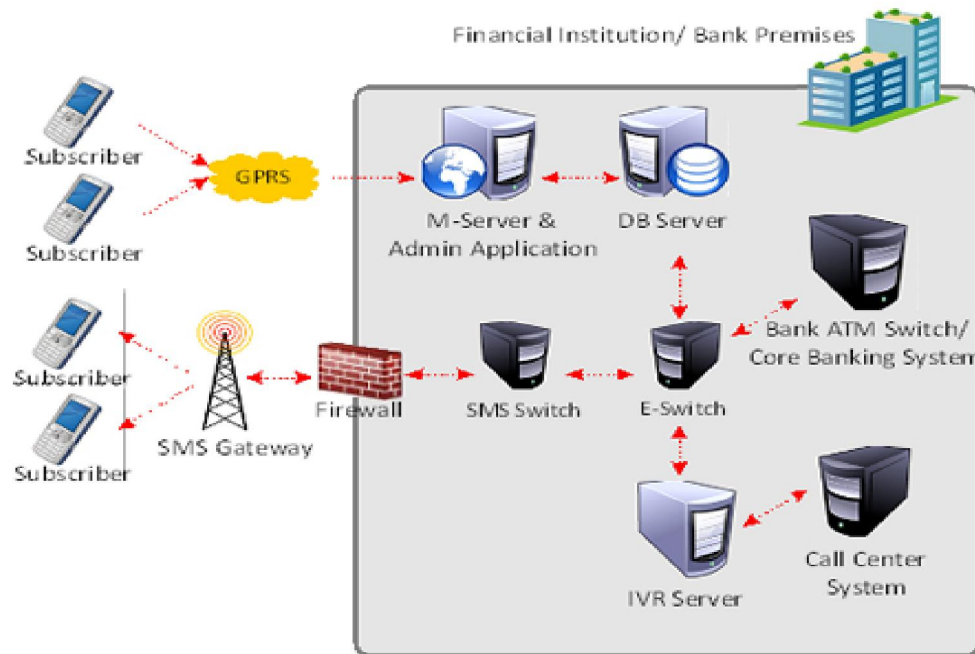
Figure 2: Mobile banking architectural framework that utilizes an SMS adopted from Epic Technology Group (2012).

The above diagram is composed of:

(i)   Mobile Network components – GSM/GPRS, SMS gateway and the mobile phones.
(ii)   The Banking system and its network components – ATM switch, SMS switch, DB servers, and the core banking system.

All the components are internetworked through secure networks such that they process can be initiated and executed as per request.

The online dictionary Techopedia (2016) explains that an SMS is supported by Global System for Mobile Communications (GSM) mobile phones and Fourth Generation (4G) wireless

networks. SMS can as well be transmitted via Web-based browser applications, Instant Message (IM) applications and Voice over Internet Protocol (VoIP) applications, for example Skype. When one creates an SMS in a mobile phone device and sends it, the device forwards the SMS through the network to a Short Message Service Center (SMSC), which, in turn, communicates with mobile networks to determine the subscriber's location. Then, the message is forwarded as a small data packet to the destination device. Subsequent messages sent by the original source device undergo the same process, also known as store and forward.

The SMSC is the entity which does the job of store and forward of messages to and from the mobile station. The SME (Short Message Entity), which is typically a mobile phone or a GSM modem, can be located in the fixed network or a mobile station, receives or sends SMS. The SMSC usually has a configurable time limit for determining how long it will store the message. SMS Gateway is an interface between software applications mobile networks and it allows the interfacing software applications to send and/or receive SMS messages over mobile network. A GSM Modem modulates outgoing digital signals from a computer or other digital device to signals for a GSM network and demodulates the incoming GSM signal and converts it to a digital signal for the computer or other digital device (Pujitha, S., & B Veera, M. 2013)

2.6 Security concerns associated with ATM transactions

The introduction of an ATM proved to be a critical technological innovation that has enabled financial institutions to provide services to their customers in a 24- hour, 7-days a week environment, enhancing efficiency and the convenience of access to cash by clients from the nearest ATM machine. Financial institutions have implemented many strategies to upgrade the security at their ATMs and reduce scope for fraud. These include choosing a safe location for installing the ATM, installation of surveillance video cameras, remote monitoring, anti-card skimming solutions, and increasing consumer awareness by informing them of various methods of safeguarding their personal information while transacting at the ATM or on the Internet.

Fraudsters have devised various methods of stealing from ATM clients. Some of the schemes involve the use of fake cards using data collected from tiny cameras and devices called "skimmers" that capture and record bank account information at the time ATM transactions. This

difficult to detect as it does not involve any fraudster-victim interaction and the absence of any fraudster makes the cardholder more relaxed and lesser conscious about the safety of their PIN.

Other schemes of ATM frauds involve the use of "duplicate ATMs" by the fraudsters. This involves the use of software to record PINs typed on ATM machines. Thereafter, duplicate cards are manufactured and money is withdrawn with the use of stolen PINs. Sometimes such frauds are an inside job – a collusion of the employees of the company issuing ATM cards. Whatever the mode of these frauds, it is definitely illegal and punishable as per the law of the concerned country. The punishment may, however, not bring back the money lost in the process. Thus, the punishment of an offender will though prove deterrent to other offenders yet it may not be the best method of restoration of stolen property. Thus, preventive safeguards and insuring the ATM fraud risks seems to be the right approach. However, the improving on transaction levels of authentication like the one proposed in this study is a more reliable to mitigating the risks.

Some of the ways to mitigate risks associated with ATM transactions are highlighted below:

- Always subscribe for an SMS-based or e-mail alerts whenever an ATM transaction associated with your account is executed.
- Financial Institution or Bank will never send you an e-mail to ask you to enter your Banking details online.
- Monitor regularly your credit card or bank account details and keep track of your transactions.
- To protect against phishing attacks, your browser should be enabled with phishing filters and never click any links in your e-mail for updating any kind of a transaction.
- Maintain a strong but easy to remember password. Keep updating it regularly.
- Try to restrict yourself from giving personal information when you receive a call from a Bank or Credit Card Provider.
- Steer clear of a jammed ATM machine that forces customers to use another ATM that has a skimmer attached to it. More often, fraudsters will disable other ATMs within a given location in order to draw users to the one that has the skimming device on it.

- Customers should check their bank accounts regularly to make sure there are no unusual or unauthorized transactions. Whenever you find unauthorized ATM transaction on your bank account, immediately notify your financial institution.
- Keep your PIN safe – never disclose the number to anyone, and cover the keypad while you are entering your PIN at the ATM machine.

Securing ATMs against fraudsters is an endless game of chess whereby criminals come up with new schemes of attack while vendors counter with new deterrents; ATM-makers add new security features, crooks invent new ways to get around them (Jayasudha, A. C, 2014).With global growth in the number of ATM installations, the numbers of ATM card holders continue to grow daily as result of e-payment awareness. Ironically, activities of card fraudsters and "intelligent criminals" appear to be on the increase. Many banks have continued to warn ATM card users against disclosing their ATM card details to a second party in order to enforce the security of ATM usage(Acharya, S., Polawar, A., & Pawar, P. ,2013).

Some of the common approaches used by fraudsters to perpetuate ATM frauds include, outright card theft, shoulder surfing of users at ATM points, use of fake PIN Pad overlay and PIN interception via emails and text messages. These ATM frauds do not affect only the banks, rather, it is a big threat to all parties involved and it requires a coordinated and cooperative action on the part of the bank, bank customers and the law enforcement agencies. ATM frauds do not just cause financial loss to banks but they also undermine customers' confidence in the use of ATMs (Muhammad, Alhassan & Ganiyu, 2015).Today due to intruder's advancements & technology improvement it is possible to fix ATM Card scanners in ATM Machine to obtain encrypted data from ATM Card, which is again used to produce the duplicate ATM card and to make fraudulent transactions. It is possible to overcome such frauds by a Combination of Bio Metrics, Face Recognition & retina. Biometric is a Greek Word where, Bio refers to life and metric refers measuring some objects that have life. Biometric measures the characteristics of both physiological and behavioural aspects of humans. These characteristics are finger prints, Voice patterns hand measurements, irises and others. The characteristics are connected to an individual user and cannot be forgotten, stolen, shared or easily hacked like passwords (Oko, S. & Oruh, J. 2012).

Personal biometrics make use of physiological aspects like the shape of the body and include but at the same time not limited to finger prints, face recognition, DNA, Palm Print, hand geometry, iris recognition and odour/scent. Behavioural Characteristics are related to personal behaviour of the person and may include things such as typing speed, gait, digital signature and voice. If we combine multiple characteristics then we can design full and secured authentication system without need of plastic ATM Cards (Hoang and Nguyen, 2015).

2.7 Conceptual Framework

The conceptual framework has three internetworked sections that exchange data. The Financial Institution/Bank holds the customer account information in the bank database. The information is shared with the ATM section and the mobile phone end user section for authentication whenever a transaction is to take place.
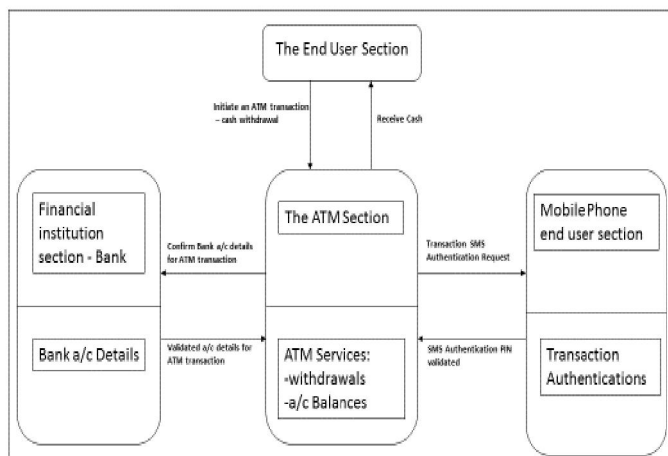
Figure 3. The Conceptual Framework for the proposed system.

The conceptual framework is categorized as follows:

(i) **Mobile Phone End User Section-** this section is used for SMS authentication of the ATM transaction for any joint account, executed from an ATM terminal. The person having the phone receives an SMS alert that a transaction of a certain amount is about to be executed in an ATM terminal and therefore it requires the phone holder to either confirm or decline such a transaction.

(ii) **ATM Section –** This is the ATM machine terminal where the card holder visits to withdraw money held in a joint account. ATM terminal machines are owned by financial institutions. They make sure that the ATM terminals are operational, loaded with cash to be dispensed upon withdrawal by the ATM card holders.

(iv) **Financial Institution Section/Bank -** Has all the databases associated with the account holders. This is where the joint account holders visit to open account and request to be issued with an ATM card and PIN. They provide the phone number to be used to authenticate ATM transactions.

(iii) **End User Section –** ATM card holder who initiates an ATM transaction. The account holder interacts with the ATM machine terminal, either to make enquiries or transact. He uses the ATM card and the PIN assigned to perform a transaction. Card and PIN offers a two factor authentication for the ATM transactions. A successful transThe person having the phone receives an SMS alert that a transaction of a certain amount is about to be executed in an ATM terminal and therefore it requires the phone holder to either confirm or decline such a transaction.

2.8 Conclusion

This chapter presented a discussion on the authentication frameworks employed in ATM transactions (current ATM framework), SMS-based authentication frameworks and conceptual framework for the study. It also highlighted on the security concerns associated with ATM transactions across the banking industry. In the following chapter the author discusses the research design method and the approach that the study has used in order to address its research objectives and questions.

<div align="center">

CHAPTER THREE

METHODOLOGY

</div>

3.1 Introduction

In this chapter the author discusses the research design method and the approach that the study has used in order to address its research objectives and questions.

3.2 Research Design

According to Kothari (2008), research methodology refers to a scientific research approach for solving a research problem systematically. The existing ATM system framework was developed as a result of design science methodology and therefore the proposed SMS-based authentication framework for a joint account ATM transaction adopts a similar research methodology. The design science approach clearly defines the prototype system requirements and with rapid prototyping methodology, the research objectives can easily be addressed.

3.2.1 Design Science

In order to achieve the research objectives and adequately address the research questions, this study employed the design science research method. The principle objective of design science is to provide new knowledge that can be used by researchers and professionals from different disciplines to design solutions to research problems in their fields (Hevner & Chatterjee, 2010).

3.3 Research Approach

The study used rapid prototyping in the development and designing of the prototype for simulation. With rapid prototyping, the steps are crunched together to reduce the amount of time needed to develop a product and the time required for training users (Jones & Richey, 2000). A prototype is a model of a system which displays limited but typical functionality.

The SMS-based authentication framework for a joint account ATM transaction proposed by the study adopts rapid prototyping methodology in the design and development of the ATM system framework.
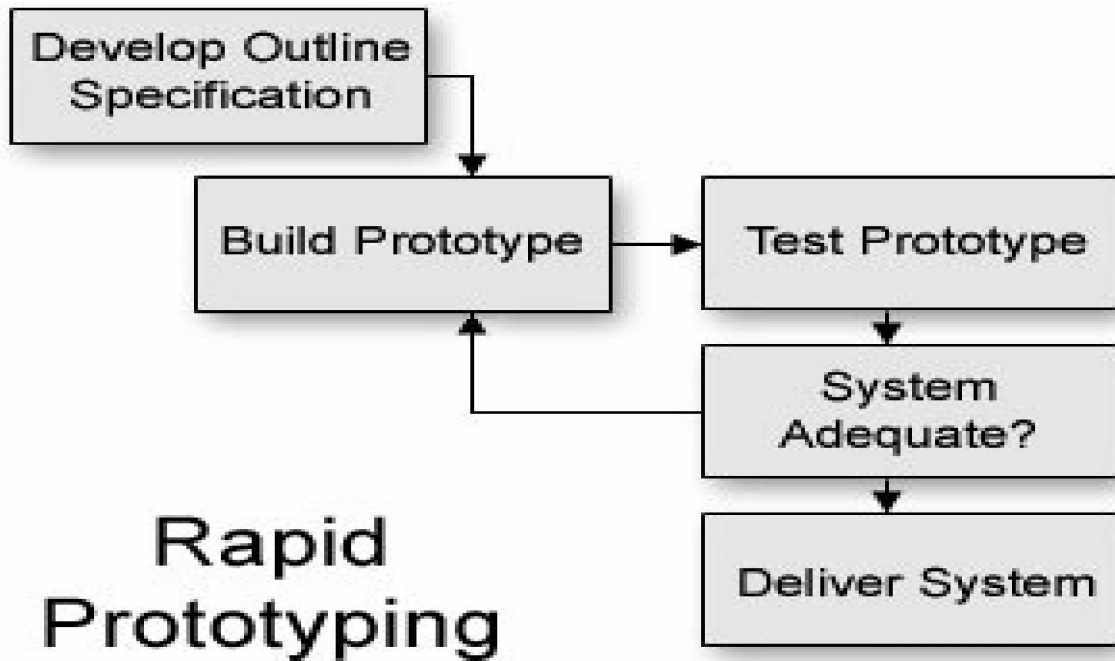
Figure 4: System development model adopted from Dashe & Thomson (2012).

3.4 Rapid prototyping

In rapid prototyping, interactive prototypes are developed which can be quickly replaced or changed in line with design feedback. This feedback may be derived from users as they work with the prototype to accomplish set tasks. This method is concerned with developing different proposed concepts through software or hardware prototypes, and evaluating them. The development of a simulation or prototype of the future system can be very helpful, allowing users to visualize the system and provide feedback on it. Thus it can be used to clarify user requirements options. Later on in the lifecycle, it can also be used to specify details of the user interface to be included in the future system (Andrew, 1991).Within software engineering circles the method is closely associated with user interface management systems and various design support tools that offer the designer a collection of libraries of process and graphical interface elements for defining the logical structure of the software. Ordinarily, the prototypes exhibit a higher fidelity with the end product than those created as part of other methods used in system software development.

Some of the benefits associated with rapid prototyping is that:

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- It provides users a tangible demonstration of what the proposed system is all about.
- The Prototypes created by this method have a high fidelity with the final product and supports metric-based software evaluations.
- It allows swift development of interactive software prototypes to users.

3.5 Conclusion

The chapter described the research design and the approach followed during the study. For the study to achieve the research objectives and adequately address the research questions, this study employed the design science research method that resulted in the development of a prototype. This is because rapid prototyping approach is associated with user interface management systems and various design support tools that offer the designer a collection of libraries of process and graphical interface elements for defining the logical structure of the software, which then provides users with tangible demonstration of what the proposed system is all about.

CHAPTER FOUR

THE PROPOSED SMS-BASED FRAMEWORK

4.1 Introduction

The aim of this chapter is to discuss the proposed framework in details and provide an overview of the sections of the proposed SMS-based authentication framework for a join account ATM transaction.

4.2 Proposed System

The proposed system is an enhanced framework of the current ATM system. As discussed earlier in this study, the current system framework is a combination of three sections:

(v)   The end user section.

(vi)   The ATM section.

(vii) The Financial Institution section.

The proposed system framework shall seek to provide an enhanced authentication framework that combines the conventional two factor authentication; what the person knows (PIN) and what the person has (Card) with an SMS-based authentication for a joint account ATM transaction. It shall have the following four sections:

(i)   The end user section.

(ii)   The ATM section.

(iii)   The Financial Institution section.

(iv)   Mobile phone end user section.

Individuals operating a joint account issued with an ATM card/PIN must authenticate all ATM transaction performed. This can also be done for an individual account holder. The proposed system shall achieve this through an addition of an extra layer of transaction authentication using an SMS send to a mobile phone, which requires a response by a means of PIN entry from the mobile phone at that point where the account holder enters the amount of money to be withdrawn from the ATM terminal, just before its dispensed.

In the case of a joint account one of the individuals will be using the phone and the other shall be the custodian of the ATM card and PIN. At any one particular time that an ATM transaction has to be carried out, the ATM card/PIN holder notifies the other partner of an intention to transact, the time and amount to be transacted. The mobile phone holder is then assured that a genuine ATM transaction is about to be executed which requires authentication once notified via an SMS. The mobile phone holder confirms the transaction's time and amount before authenticating the transaction. Once authenticated, the money is dispensed by the ATM.

Delays in authentication or lack of authentication shall automatically abort the ATM transaction. This kind of an arrangement shall provide a stronger enhanced security for ATM transactions, a process that upholds financial accountability and transparency for joint account holders using an ATM as an alternative service delivery channel.

4.3 The Proposed ATM framework
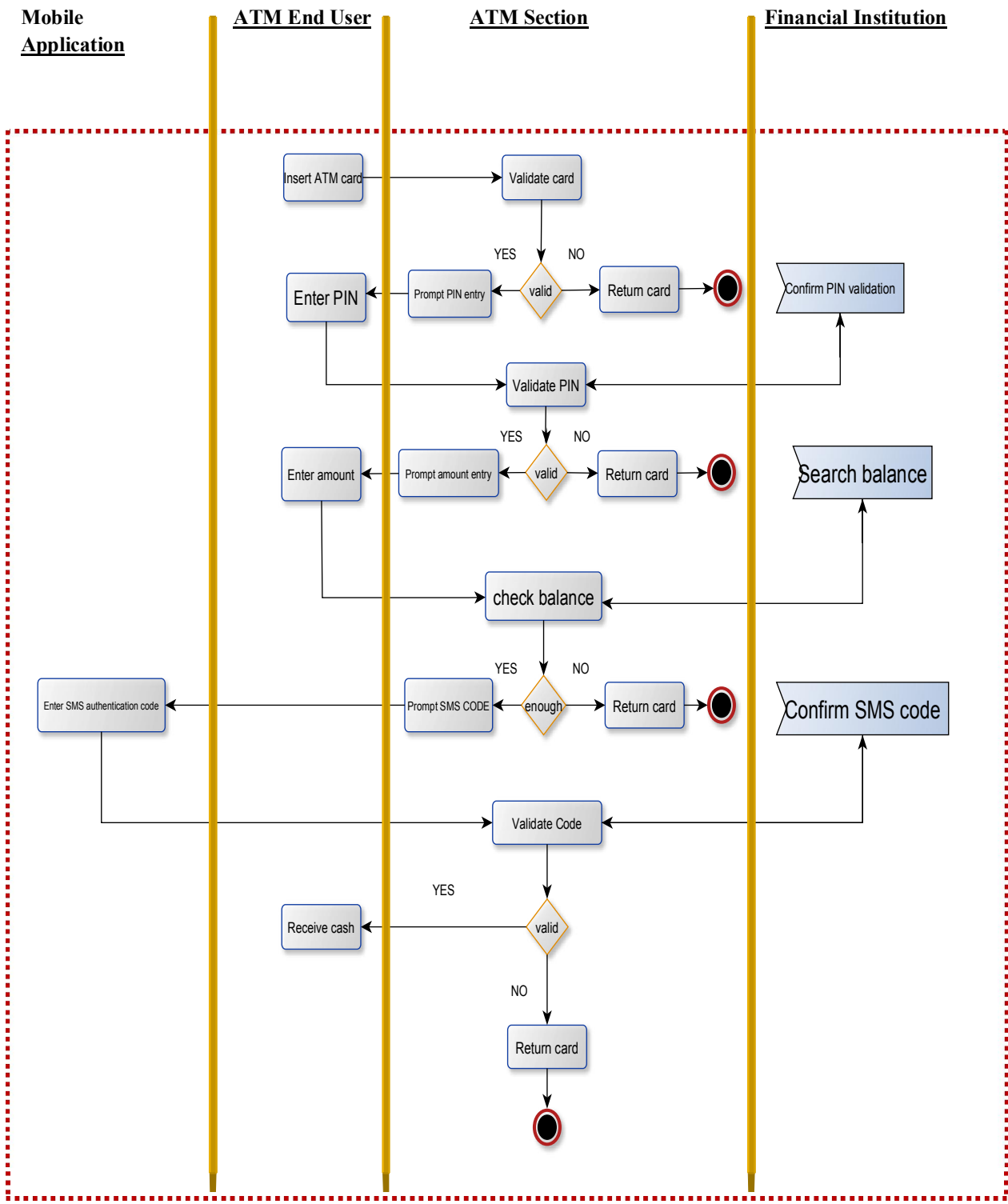
Figure 5: The Proposed ATM framework.

4.4 Components of the Proposed ATM Framework

This research proposed an ATM framework which is made of four sections each with its own components and functionality. These components work together in order to achieve the research objectives at the same time adequately address the research questions.

(i) **The mobile application** – this is a section in the proposed ATM framework that forms the SMS-based authentication component. During the account opening stage, the joint account holders are required to provide their details including their preferred mobile phone number. The person assigned the ATM card and PIN must not be the same one in possession of the phone. During an ATM transaction, the person having the phone receives a request in the form of an SMS from the person transacting at the ATM terminal machine. The SMS content shows the amount to be transacted. The phone holder then authenticates the transaction by either confirming or declining.

(ii) **The ATM End User** – in the proposed framework, the ATM end-user section has various components which include the person who performs the transactions, the ATM card and the PIN. The card holder interacts with ATM machine terminal through the card. At the time of transaction, they are required to enter the PIN and then make enquiries like checking balances or changing PIN. They also withdraw funds by following the simple instructions: insert card, enter PIN, enter amount, receive cash and collect card. This will only be successful upon authentication from the phone holder.

(iii) **The ATM section** – this refers to the ATM machine terminal. Any account that has been opened in a bank an assigned a valid ATM card can be accessed through an ATM terminal. The proposed ATM framework allows individuals who have been assigned a joint bank account and allocated an ATM card and PIN to access their account through the ATM machine terminal. They can make enquiries about their account status or at the same time make transactions like cash withdrawal from the ATM machine terminals.

(iv) **The financial institution** – for the purposes of the study, the financial institution is a section of the proposed ATM framework. Financial institutions allow clients to open a bank account and keep their finances in those accounts. The accounts can be opened by individuals, institutions or join accounts for business partners or spouses. Account

holders submit their accurate information and documentations to the bank to be used for the purposes of opening an account. The bank then holds this information in their databases. The information is linked to an account. This study proposed an SMS-based authentication for a joint account ATM transaction. Two individuals allocated with an account number may request to be issued with an ATM card and   PIN to be used for transactions at the ATM terminal machines. With the proposed ATM framework, account holders may not have to destroy their ATM PINs every time they are issued with ATM cards as is the case at the moment whereby clients are advised to memorize and destroy their ATM PINs as soon as they are issued with them, due to security reasons. Instead they can keep both their PINs and ATM cards together since no such ATM transactions can be effected by anyone without the account holder's authentication through their mobile phones. This curbs on fraudulent ATM transactions, minimizing the security risks of financial loss or banks losing credibility.

4.5 Conclusion

This chapter gave brief background information of the proposed system which is an enhanced framework of the current ATM system, discussed earlier in this study. The chapter highlighted the components of the existing ATM framework which has three sections: End User section, the ATM section, and the financial institution section. The chapter then goes further to explain the various sections of the proposed ATM framework and their components: End user and its components, Mobile application, ATM section and the financial institution. The proposed framework has an additional section, which is the mobile application section, used to provide the SMS-based authentication upon the execution of an ATM transaction.

The next chapter discusses how the prototype is designed, the prototype input and output parameters, the testing of the prototype to check whether it meets the research objectives and finally evaluating the output of the prototype to ensure it addresses the research questions of this study.

CHAPTER FIVE
PROTOTYPE DESIGN, TESTING AND EVALUATION.

5.1 Introduction

In this chapter, a discussion of how the prototype is designed ,the prototype input and output parameters, the testing of the prototype to check whether it meets the research objectives and finally evaluating the output of the prototype to ensure it address the research questions is presented.

5.2. The Proposed System Prototype Design

The design of a prototype requires resources and user involvement. Isensee and Rudd (1996), suggested a general procedure for adopting the rapid prototyping development method and to achieve the objective of this study, a similar procedure is adopted, and is outlined as follows:

- Enough time shall be required to create the prototype. If the prototype is to be evaluated with users then more time will be required to design relevant tasks, recruit the users, evaluate the prototype and report the results. Then assemble the necessary equipment, including the hardware and software tools necessary to create the interactive prototype.

- The Development of the prototype itself shall be the next step.

- Appropriate users shall be selected to test the prototype. A facilitator will also be required to instruct the users and run the evaluation. Prepare realistic tasks to occupy the users as they work with the prototype. Pilot the evaluation procedure and ensure the prototype can be used to accomplish the tasks. Ensure recording facilities are available and functioning. Each session shall be conducted independently. The facilitator shall instruct the user to work through the allocated tasks, interacting with, and responding to the system as appropriate.

- If necessary additional information can be obtained by interviewing users following their use of the prototype. Analyze the obtained information and then summarize the observations and user evaluations. Summarize design implications and recommendations

for improvements and feedback and where it shall be necessary the prototype redefined and the above process repeated.

In the case of this study however, the prototype is a web based application that simulates a core banking system whereby a new client is registered and assigned an account number. The application also allows the same client to be assigned an ATM card and a PIN to be used to transact in the ATM machine.

5.3 The WAMP Application Platform

The prototype has been developed using the WAMP applications with an objective of using the prototype to demonstrate the working of the proposed framework.
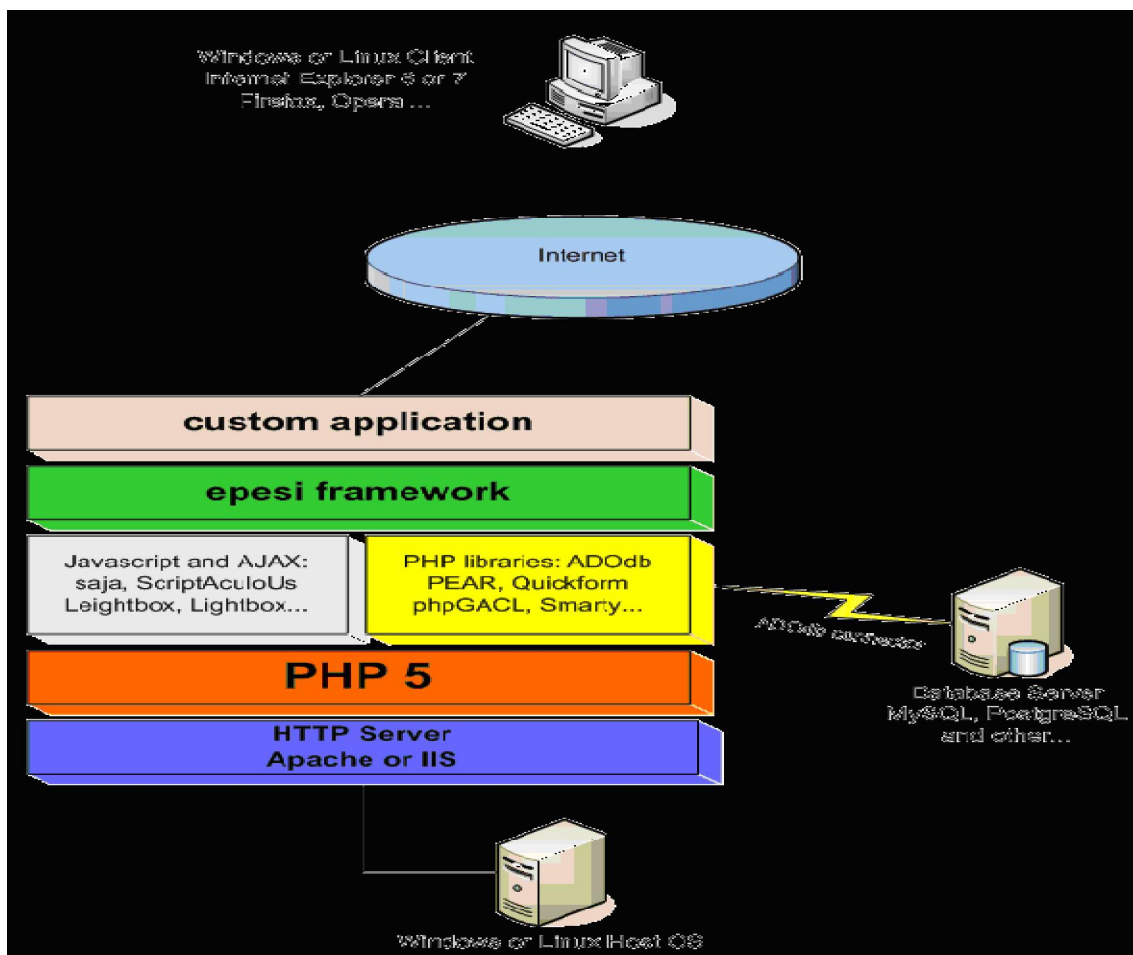
Figure 6: WAMP multitier architecture diagram adopted from Apache software foundation (2001).

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The WAMP Platform is a multi-tier enterprise application comprising the web server tier, PHP programming tier, database server tier and business logic tier. The WAMP (Windows, Apache, MySQL and Python) can then be said to be group software often used to build dynamic Web sites or server (Zhang, J. 2010). They are separate programs, but because of their compatibility, they constitute a powerful Web application platform.

The window-based applications are:

(i) Windows which the operating system:

This is an Operating System produced by Microsoft windows.

(ii) Apache that forms the web server :

Apache Web Server is a very stable and robust web server for the Linux, UNIX, Windows and other related operating systems in existence. Apache is a process-based structure, therefore not suitable for multi-processor environment (Mockus et al. 2002). The layout in the figure below demonstrates the general setup flow to follow, when setting up a Web Server or HTTP server.
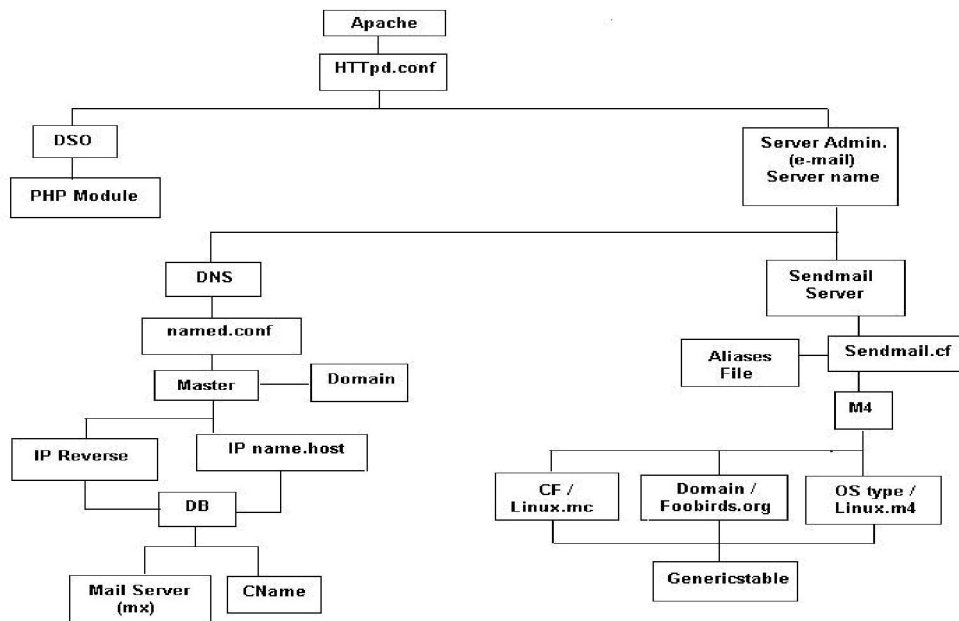
Figure 7: Apache server architecture diagram adopted from Apache software Foundation (2001).

(iii) MySQL that handles the database component:

MySQL is a popular relational database management system. It can provide high performance and stability. It is used by website developers to build different types of web applications. It also provides API for many languages such as C, C++, Java and PHP. The top layer of MySQL architecture includes the connection handling, authentication, security management. The middle layer is the core of MySQL, including query parsing, analysis, optimization, and caching. It also provides functions across storage engines, including stored procedures, triggers and views and so on. The bottom layer is a storage engine, which is responsible for access to data. Web server through the storage engine can interact with a variety of storage engines (Turan Jr, B. 2009). The layout below shows the MySQL architecture.
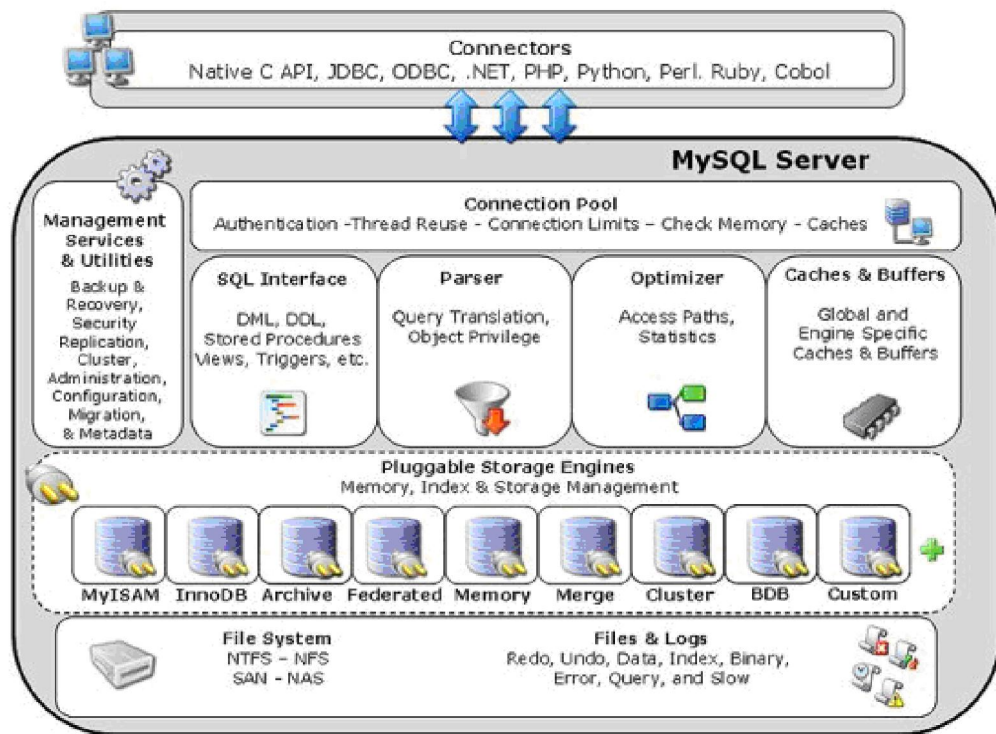
Figure 8: MySQL database server architecture diagram adopted from Apache software foundation (2001).

(iv) PHP that represents the scripting language:

According to Zend Technologies (2016), PHP is a webpage programming language that was designed to produce dynamic web pages. For this purpose, PHP code is embedded into the html source file with PHP tags and interpreted by a web server. PHP's special syntax mixes C, Java, Perl syntax. It can be faster than the CGI or Perl when it comes to implementing dynamic webpages. The diagram below shows the PHP architecture layout. The top layer is web serve which will process PHP code, middle layer is PHP core which provides most important PHP API, such as connection to database, under it is Zend API and extensions, the bottom layer is Zend engine which is used as PHP compiler and executor.
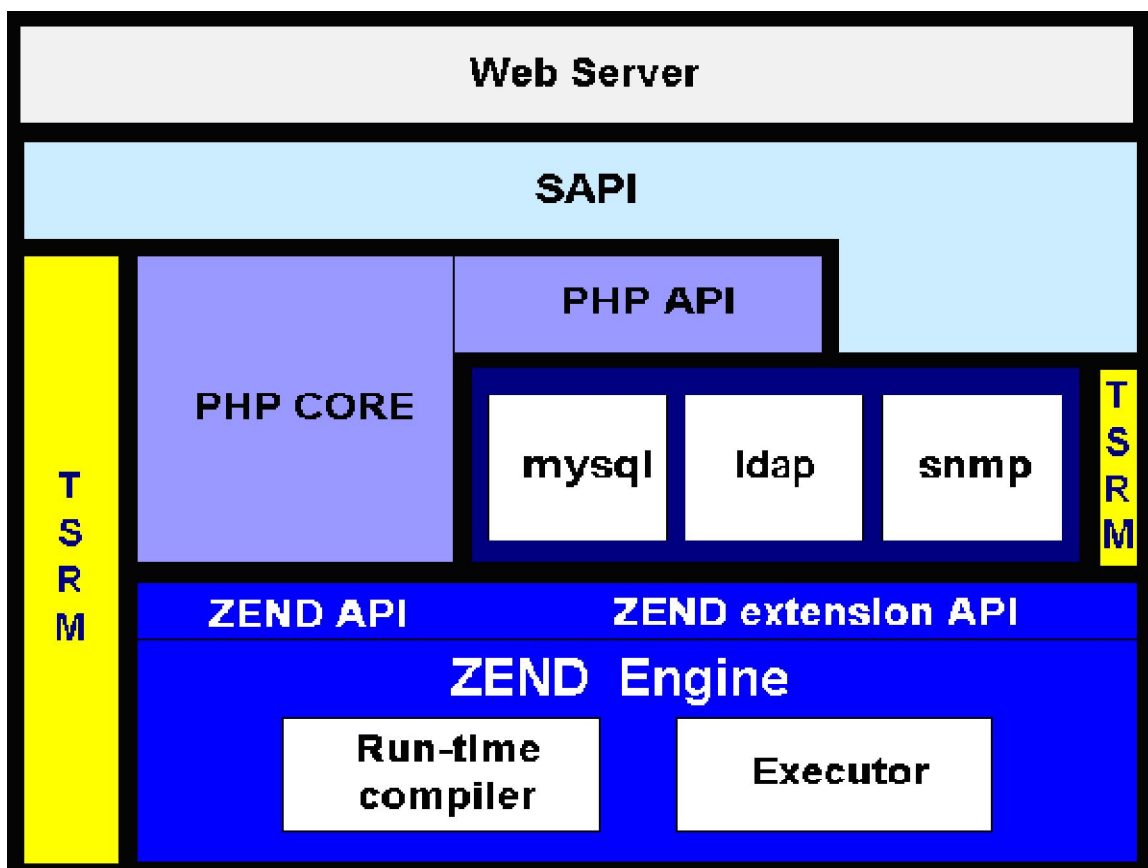
Figure 9: PHP architecture diagram adopted from Zend Technologies (2006).

5.4 Hosting the WAMP server on the Internet

For the purposes of this study the procedure for hosting the WAMP server on the internet is summarized as follows: First of all, we should get the WAMP stack up and running on the local

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host. To confirm if a web application is hosted on the personal computer, we try to check if we can reach the application by typing this URL in the address bar:

```
http://localhost/     # or http://127.0.0.1
```

This procedure should enable you to have access to your router web interface. Usually it is reachable by navigating to:

```
http://192.168.1.1
```

Sometime the approach may differ based on the router model. When in doubt, open the command prompt (cmd), type ipconfig and press enter. The below details shall be displayed:

```
C:\>ipconfig

Ethernet adapter Local Area Connection:

   Connection-specific DNS Suffix  . :
   IP Address. . . . . . . . . . . : 192.168.1.27
   Subnet Mask . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . : 192.168.1.1
```

Please take note of the IP address: that's your private address, which uniquely identifies you in your local network. If you try it in your browser, you should be able to see the public contents of your server.

5.5 Prototype Data flow diagram

For this study to adequately meet its research objectives and adequately address the research questions, there must exist a clear data flow model that demonstrates how data is shared among the various components of the system. The study therefore adopted the below data flow model.
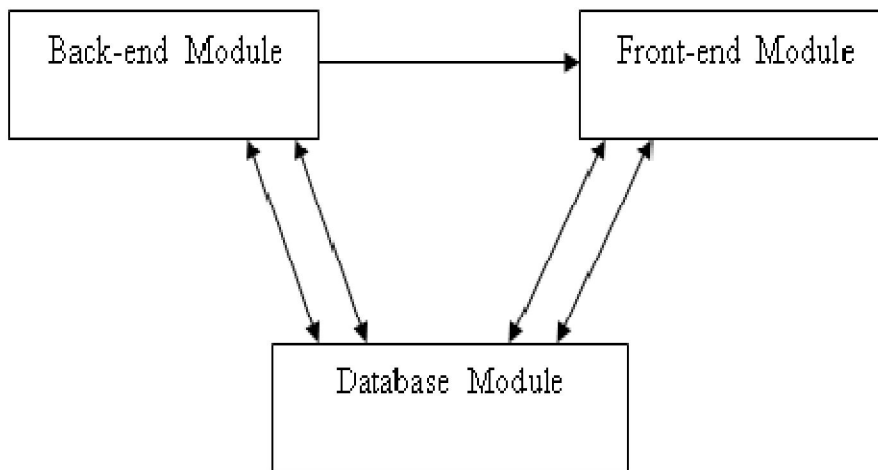
Figure 10: Data flow diagram.

The data flow diagram has the following components modules:

(i) Back-end Module – includes the bank admin login.

(ii) Front-end Module – user interfaces

(iii) Database Module – databases management and admin

5.6 Prototype System Design

The prototype design was approached from three demensions:

(i) **Financial Instiutions dimension** – this is where the system is designed to capture the client details. The user interface allows client information to be entered into the system from the bank. First a bank adminstrator has to login with the corect credentilas. On successful login, the client details can then be keyed in. the admin login interface is displayed below

A username and a password are required for login. A successful login lead leads to the interface displayed below. A new client is then registered in the system. The objective of developing a prototype for the study is to test and evaluate its results to see whether it meets the research objectives. At the point of registering a client, key details must be taken into consideration. One is that this is a joint account, where to people have applied for to run a joint account in a bank. We therefore require a phone number to be a key

factor at account registration. The study considered the listed details as critical during account registration:

(i)   Name of the clients – joint names

(ii)   E-mail address

(iii)   Cellphone number

(iv)   Identity Card number

(v)   Amount to be deposited into account.

The screen shot above shows the interface of how customer details are captured into the core banking system at the time of account opening, with all the required fields necessary for purposes of the study. From the user interface displayed above, pressing "create customer" will automatically assign an account number into the system for the registered client. In the example above, a new joint account for evans chesang and makupi daniel has been successfully created in the system and assigned account number 967842. This account will then be used to order an ATM card for the customer.

The next step is to order an ATM card for the account number assigned to the client. For our case the account number 967842 assigned to evans chesang and makupi Daniel has to be allocated an ATM card to be used for all ATM transactions associated with the account. The screen shot below demonstrates how an ATM card for a particular account is ordered and for this case, we shall use account number 967842 to order for an ATM card.
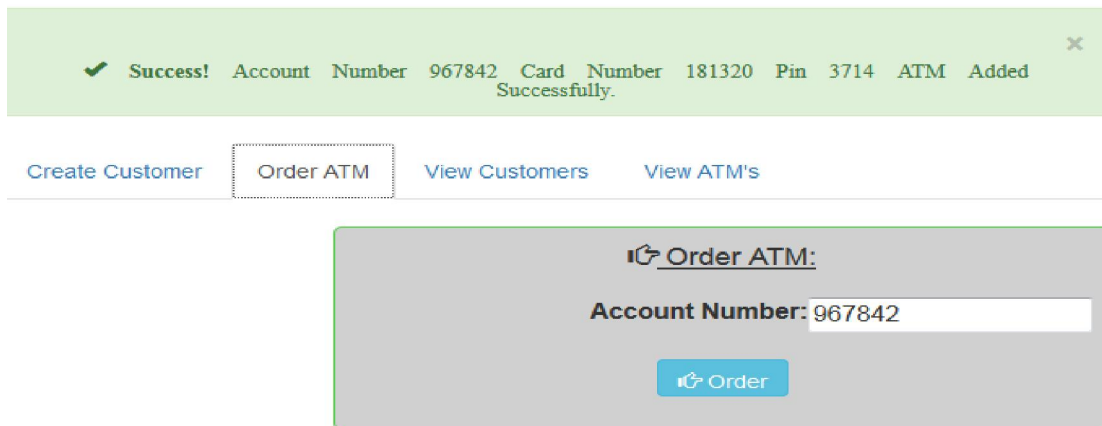
The user interface above displays how an ATM card for an account is ordered. Therefore, our account number 967842 has been allocated an ATM card number 181320 and a PIN for that particular card. Conventionally, ATM cards and PINs are generated differently for security reasons. For this study, they are both generated at the same time.

(ii)   System database dimension:

To view customer details in the system database we go to "view customers" menu and click. The screen shot below displays the "view customers" menu.

| Create Customer | Order ATM | View Customers | View ATM's |

Name	Account No	Email	Phone No	ID No	Balance
Nathan kiprotich ngenoh	535925	nate@gmail.com	+254729667121	28402117	94173
Evans chesang and makupi daniel	967842	account@tbank.co.ke	+254724946499	123456789	500000

The customer details are on the above screen shot.

We can also view the number of ATM cards that have been allocated to account numbers. We do this by going to "view ATMs" as shown in the display below:

from

| Create Customer | Order ATM | View Customers | View ATM's |

Page **1** of **1**

Account No	Card Number	PIN Number
535925	890148	6567
967842	181320	3714

From the above display, it is clearly seen that our account number 967842 has been allocated ATM card number 181320 and an ATM PIN number 3714 in the core banking system of the financial institution. This information is only available to the system admin, who has also the rights to create other users as shown in the screen shot below:
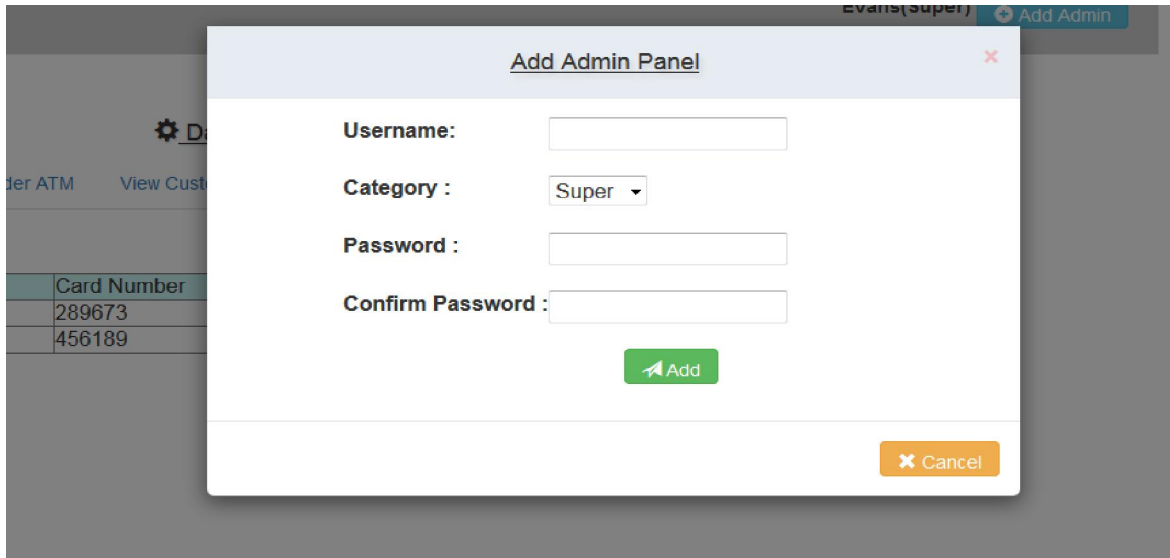
(iii)   End-user dimension/ Client Dimension.

Now from our prototype system, we have created a new join account number 967842 for the client and went ahead to assign an ATM card and a PIN to the client. The client deposited money into the account.

To enforce an SMS-based authentication framework for a joint bank account operated by individuals issued with an ATM card, one person has to operate with the ATM card and the PIN while the other person has to use the phone to authenticate a transaction effected through an ATM machine terminal. The mobile phone number of the client is captured during the account opening process which is assigned to that particular account as instructed by the client. This is the phone number that shall be used to provide the SMS-based authentication during an ATM transaction.

For the purposes of this study, the screen shot below represents an ATM machine terminal. A customer is requested to enter their ATM card, and PIN which is then validated. With valid details, the customer may then proceed to transact – for this case, withdraw money from the ATM machine. A customer enters the amount and clicks withdraw. An authentication SMS is

then pulled up to the phone attached to the account and upon the confirmation of the transaction via the phone, the transaction is then executed successfully.

For the purpose of this study, the screen shot above is the prototype that represents an ATM machine terminal display unit whereby a client inserts an ATM card and enters the ATM PIN before transacting.

During our previous discussions in this study, we generated an account number 967842 and assigned an ATM card number 181320 and PIN 3714 to the account. These details are issued to the client. The joint account holders then decides to withdraw money from the ATM machine. The first procedure is to enter the ATM card number and PIN as shown in the screen shot below.

The card number and PIN are keyed in and submitted for validation. Valid ATM card and PIN will lead to the screen shot displayed below.

Withdraw Money

Available Amount	Minimum withdraw amount
500000	200

Enter Amount: [   ]

[Withdraw]

This is a transaction involving a joint account and has to be authenticated by the person having the phone number that was registered during account opening. At this stage, just on the the click of the "withdrwa" button, the sms-based authentication is executed. A message is sent to the to phone number asking the other person to either confirm or decline the transaction. The authentication SMS reads **"You are about to withdraw ksh 10500 Reply with 1 to confirm or Reply with 2 to decline".** Upon replying with 1, the transaction is authenticated and the person withdrawing the money from the ATM machine terminal receives the money and the transaction is closed.

The screen shot below displays the authentication SMS message received on the phone.
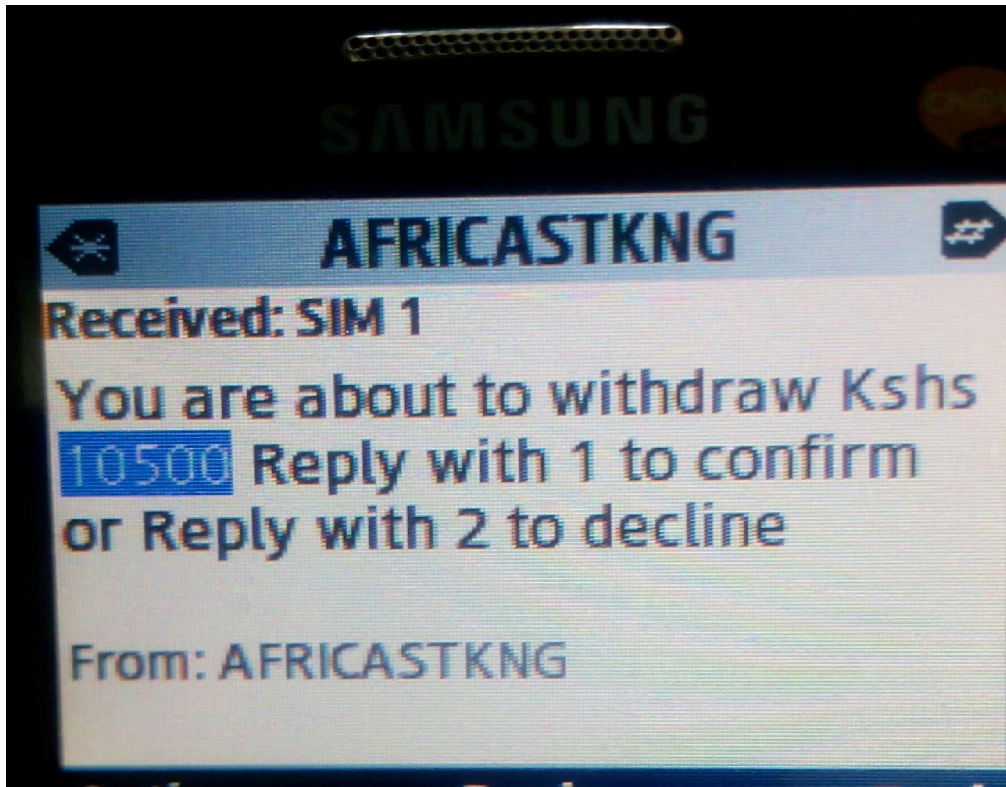
Upon transaction authentication via SMS the withdrawal is effected as shown on the screen shoot display below.

Invalid ATM card and PIN entry is displayed in the screen shot below – which unsuccessful.

CLIENTS WITHDRAW

Card Number:	*Enter your Card Numbe
PIN :	*Enter your PIN

👤 Submit

⚠ **Error!** Incorrect Password or Account number.

5.7 Prototype Testing and Evaluation

The prototype was developed and subjected to the testing stage. At this stage user assessment testing was carried out to ascertain the prototype output and obtain a feedback. A few people were picked to participate in the testing process. The testing process involved the withdrawal of some money from the designed prototype which simulates and ATM terminal machine. The prototype screen is as shown below:

CLIENTS WITHDRAW

Card Number:	*181320
PIN :	*●●●●

👤 Submit

A user participating in the assessment test is assigned an ATM card which is card number 181320 and PIN which is a four digit secret code, to be used for transaction. Successful login leads to the withdrawal interface shown below:

Withdraw Money

Available Amount	Minimum withdraw amount
500000	200

Enter Amount: [   ]

[Withdraw]

Prior to transacting, the two joint account holders issued with an ATM card and PIN had agreed on the amount to be transacted at the ATM. For this case, the agreed amount is kenya shillings 10,500 as indicated in the screen below:

✔ **Success!** 10500Kshs Withdrawn Successfully.

Withdraw Money

Available Amount	Minimum withdraw amount
489500	200

Enter Amount: 10500

[Withdraw]

Upon pressing the withdraw button, an SMS for authenticating the transaction is received on the mobile phone of the, requesting for transaction confirmation. If the amount is equal to what had earlier been agreed to be withdrawn by the joint account holders, then the transaction can be authenticated by a reply with 1 to confirm otherwise decline transaction by replying with 2. This is displayed in the below mobile phone screen:
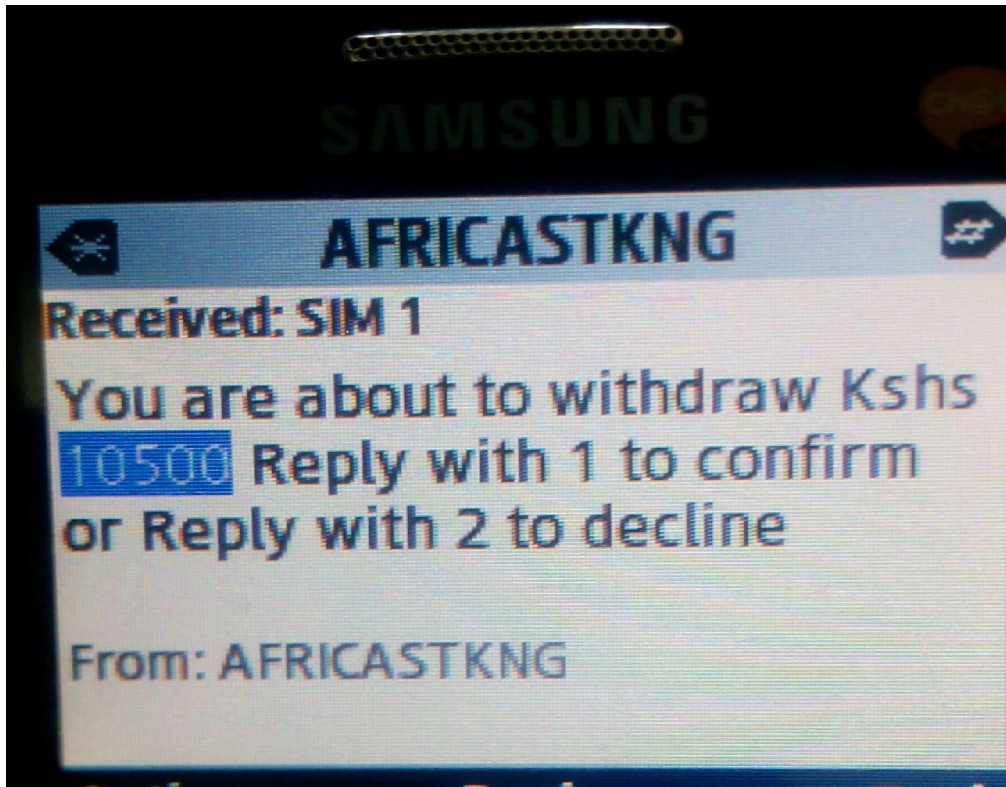
The transaction is then, execcuted successfully as displayed on the screen shot below.
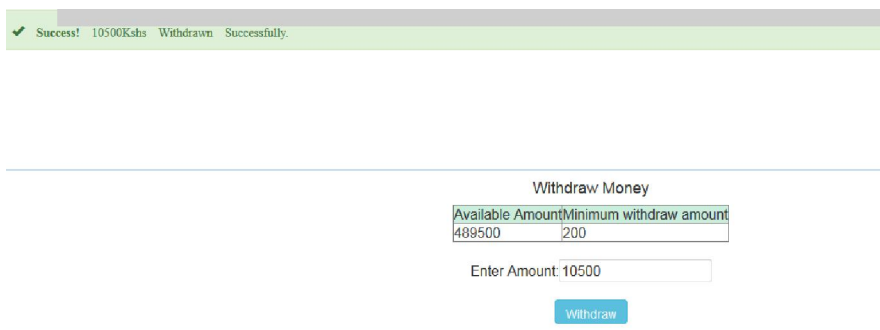
The user assessment tests above confirms that the prototype performance met the research objectives and adequately addresses the research questions of the study.

5.8 Conclusion

This chapter discussed the proposed framework in details providing an overview of the proposed system prototype design, the data flow diagram and how the SMS-based authentication framework for a join account ATM transaction is implemented. It further discusses how the prototype is designed in details giving and explanation about the WAMP server. It also explains the prototype input and output parameters, the testing of the prototype to check whether it meets the research objectives and finally evaluating the output of the prototype to ensure it addressed the research questions of the study. This was confirmed at the user assessment test stage.

CHAPTER SIX

CONCLUSION, RECOMMENDATION AND FUTURE RESEARCH

6.1 Introduction

The purpose of this study was to come up with an SMS-based authentication framework with a prototype for ATM transactions involving a joint account operated by two individuals issued with an ATM card, to evaluate the performance of the developed prototype and to establish the feasibility of implementing the proposed authentication framework and the prototype by service providers offering joint account services.

6.2 Conclusion

The strong authentication framework proposed by the study not currently implemented. Therefore, an authentication framework such as this shall be of great significance to financial institutions and individuals having a joint account and in many instances prefer to do their transactions on ATM terminals. Individual account holders may at the same time subscribe to this kind of authentication framework and may not have to destroy their ATM PINs every time they are issued with ATM cards as is the case at the moment, where clients are advised to memorize and destroy their ATM PINs as soon as they are issued with, due to security reasons. With the proposed framework, customers can keep both their PINs and ATM cards together, since no such ATM transactions can be effected by anyone without the joint account holders' authentication through their mobile phones. This curbs on fraudulent ATM transactions, minimizing the security risks of financial loss or banks losing credibility

The overall objective of the proposed study was to come up with an authentication framework for transactions done via ATM terminals. The study proposed the combination of both ATM card and PIN, with an SMS generated on a mobile phone to be used for additional authentication. The study designed a prototype, tested and evaluated the performance of the prototype in view of addressing the research objectives. The study went further and addressed the research questions clearly explaining the requirements for the development of a prototype for the proposed SMS-based authentication framework for a joint account ATM a transaction. A few users were selected to perform user assessment test and evaluation the outcome, based on what is proposed

in the study. Upon testing and evaluating the performance of the prototype, the framework proposed by the study clearly demonstrated the concept of a strong authentication through the SMS-Based authentication for an ATM transaction involving individuals operating a joint account issued with an ATM card. The objectives of the study were achieved.

 The prototype designed demonstrated the working of the proposed SMS-based authentication framework for a joint account ATM transaction.

6.3 Recommendation

The testing and the evaluation of the designed prototype in this study clearly demonstrated that the proposed framework guarantees secure ATM transactions for the account holders without exposing both the financial institution and the account holders to any form of security risk, fraud or reputation risk. ATM transactions for joint account holders issued with an ATM card and PIN can easily be subjected to strong authentication framework using an SMS, minimizing frauds and financial loss. Individual account holders may at the same time subscribe to this kind of authentication framework.

In view of the above, this study has proposed a strong authentication framework that combines both two factor authentication with an SMS. This is a significant contribution to the body of knowledge and may therefore be used by scholars and researchers as a reference material in future research.

The study recommends that financial institutions and other ATM service providers adopts and implements the SMS-based authentication framework for ATM transactions involving a joint account operated by two individuals issued with an ATM card.

6.4 Future Research

The testing and evaluation of the proposed framework in this study clearly demonstrated the concept of a strong authentication through the SMS-Based authentication framework for an ATM transaction involving individuals operating a joint account issued with an ATM card. However, this kind of an authentication is only limited to access of financial services through an ATM terminal and in many instances, these terminals are confined to certain geographical

locations preferred by banks, creating inconveniences customers. Further research can therefore be done to explore the possibility of introducing joint accounting holding for MPESA accounts and a similar authentication framework and be adopted to authenticate MPESA joint account transactions.

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APPENDICES

APPENDIX A: SYSTEM DESIGN SOURCE CODE

```html
<!DOCTYPE html>
<html>
<head>
      <title>Login | ADMIN</title>
    <meta http-equiv="X-UA-Compatible" content="IE=9" />
      <link rel="shortcut icon" href="../images/logo.jpg" type="image/png">
      <link rel="stylesheet"
href="../RESOURCES/bootstrap/dist/css/bootstrap.min.css">
      <link rel="stylesheet" href="../functions/strath.css">
      <script src="../RESOURCES/jquery/dist/jquery.min.js"></script>
    <script src="../RESOURCES/bootstrap/dist/js/bootstrap.min.js"></script>
    <style type="text/css">
      .login{
        margin-top: 10px;
      }
      .login h4{
        color: black;
        text-shadow: 2px 2px 2px #cfcfcf;
      }
      .loginform{
        width: 30%;
        border: 8px double #1f0;
        border-radius: 10px;
      }
      form{
        padding: 20px;
      }
    </style>
</head>
<body>
<div class="header">
</div>
<div align="center" class="login">
  <div style="height: 50px;">
     <img src="../images/logo.jpg" height="100%">
  </div>
  <h4>ADMINISTRATOR LOGIN PANEL</h4>
  <div class="loginform">
    <form method="post" action="index.php">
    <!-- include administration.php file for login processing -->
      <div></div>
      <label>Username:</label>
      <font color="red">*</font><input type="text" id="username"
name="username" placeholder="Enter your Username" value=""><br><br>
      <label>Password:</label>
      <font color="red">*</font><input type="password" name="password"
placeholder="Enter your password">
      <div><br>
        <button class="btn btn-primary" type="submit" name="login"
style="height: 28px;">
        <span class="glyphicon glyphicon-user"></span> Sign In</button>
      </div>
    </form>
  </div>
```

```html
    </div>
    </body>
    </html>


<!DOCTYPE html>
<html>
<head>
      <title>Login | ADMIN</title>
    <meta http-equiv="X-UA-Compatible" content="IE=9" />
      <link rel="shortcut icon" href="../images/logo.jpg" type="image/png">
      <link rel="stylesheet"
href="../RESOURCES/bootstrap/dist/css/bootstrap.min.css">
      <link rel="stylesheet" href="../functions/strath.css">
      <script src="../RESOURCES/jquery/dist/jquery.min.js"></script>
    <script src="../RESOURCES/bootstrap/dist/js/bootstrap.min.js"></script>
    <style type="text/css">
      .login{
        margin-top: 10px;
      }
      .login h4{
        color: black;
        text-shadow: 2px 2px 2px #cfcfcf;
      }
      .loginform{
        width: 30%;
        border: 8px double #1f0;
        border-radius: 10px;
      }
      form{
        padding: 20px;
      }
    </style>
</head>
<body>
<div class="header">
</div>
<div align="center" class="login">
  <div style="height: 50px;">
      <img src="../images/logo.jpg" height="100%">
  </div>
  <h4>ADMINISTRATOR LOGIN PANEL</h4>
  <div class="loginform">
    <form method="post" action="index.php">
    <!-- include administration.php file for login processing -->
      <div></div>
      <label>Username:</label>
      <font color="red">*</font><input type="text" id="username"
name="username" placeholder="Enter your Username" value=""><br><br>
      <label>Password:</label>
      <font color="red">*</font><input type="password" name="password"
placeholder="Enter your password">
      <div><br>
        <button class="btn btn-primary" type="submit" name="login"
style="height: 28px;">
        <span class="glyphicon glyphicon-user"></span> Sign In</button>
      </div>
    </form>
```

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```
    </div>
  </div>
</body>
</html>




<html>
<head><title>Bank ADMIN</title>
  <meta http-equiv="X-UA-Compatible" content="IE=9" />
      <link rel="shortcut icon" href="../images/logo.jpg" type="image/png">
      <link rel="stylesheet"
href="../RESOURCES/bootstrap/dist/css/bootstrap.min.css">
  <link rel="stylesheet" href="../strath.css">
  <link rel="stylesheet" href="../RESOURCES/jquery-ui-1.11.4.custom/jquery-
ui.css"  type="text/css">
      <script src="../RESOURCES/jquery/dist/jquery.min.js"></script>
  <script src="../RESOURCES/bootstrap/dist/js/bootstrap.min.js"></script>
  <link rel="stylesheet" href="../css/dashboard.css" media="screen" title="no
title" charset="utf-8">
</head>
<body>
<div class="header">

  <div class="nav nav-fixed" id="off" style="width:80%; background-color:
#cfcfcf; height: 7%;">
    <div class="pull-right" style="margin-right: 2%;">
    <!-- this should fetch data from the database to identify the logged in
user session -->
      <b>Evans (Super)</b>
      <button class="btn btn-info" type="submit" data-target="#addAdminModal"
data-toggle="modal"
      style="height: 28px;margin-top: 5px;"><span class="glyphicon glyphicon-
plus-sign"></span> Add Admin</button>
    </div>
  </div>
</div>
<!-- This div holds the admin operations tabs -->
<div align="right" class="dashboard">
  <h4><span align="center" class="glyphicon glyphicon-cog"></span>
Dashboard</h4>
  <!--This Div Hold the Code to include the administration.php for all
processing involved. -->
  <div align="center"></div>

  <ul id="tabs" class="nav nav-tabs" data-tabs="tabs">
    <li class="active"><a href="#create" data-toggle="tab">Create
Customer</a></li>
    <li><a href="#orderatm" data-toggle="tab">Order ATM</a></li>
    <li><a href="#viewcustomers" data-toggle="tab">View Customers</a></li>
    <li><a href="#viewatms" data-toggle="tab">View ATM's</a></li>
  </ul>
  <div id="my-tab-content" class="tab-content">
    <div class="tab-pane active" id="create">
      <div class="table-responsive"><br>
        <div class="create">
```

```html
        <h4><a href="#"><span class="glyphicon glyphicon-plus"></span></a>
Create New Customer:</h4>
        <form action="dashboard.php" method="POST">
          <table align="center">
            <tr>
              <td><label>Full Name</label></td>
              <td><font color="red">*</font><input type="text"
name="fullname" value="" autofocus></td>
            </tr>
            <tr><td> </td><td> </td></tr>
            <tr>
              <td><label>Email Address </label></td>
              <td><input type="text" name="emailaddress" value=""></td>
            </tr>
            <tr><td> </td><td> </td></tr>
            <tr>
              <td><label>Phone Number </label></td>
              <td><font color="red">*</font><input type="text"
name="phonenumber" value=""></td>
            </tr>
            <tr><td> </td><td> </td></tr>
            <tr>
              <td><label>ID Number</label></td>
              <td><font color="red">*</font><input type="text"
name="idnumber" value=""></td>
            </tr>
            <tr><td> </td><td> </td></tr>
            <tr>
              <td><label>Deposit Amnt</label></td>
              <td><font color="red">*</font><input type="text" name="amount"
value=""></td>
            </tr>
            <tr><td> </td><td> </td></tr>
          </table><br>
          <div align="center">
            <button class="btn btn-info" type="submit" name="register"
style="height:28px;">
            <span class="glyphicon glyphicon-pencil"></span> Create
Customer</button>
          </div>
        </form>
        </div>
      </div>
    </div>
    <div class="tab-pane" id="orderatm">
      <div class="table-responsive"><br>
      <div class="create">
        <h4><span class="glyphicon glyphicon-hand-right"></span> Order
ATM:</h4>
        <form action="dashboard.php" method="post">
          <table>
            <tr>
              <td><label>Account Number:</label></td>
              <td><input type="text" name="accountnumber" value=""></td>
            </tr>
          </table><br>
          <div align="center">
```

```html
            <button class="btn btn-info" type="submit" name="order"
style="height:28px;">
            <span class="glyphicon glyphicon-hand-right"></span>
Order</button>
          </div>
        </form>
      </div>
      </div>
    </div>
    <div class="tab-pane" id="viewcustomers">
      <div class="table-responsive"><br>
        <div class="search">
        <div>
                <p style="float:left">Page <b>1</b> of <b>1</b></p>
          <table class="table-hover" border="1" width="100%">
            <tr style="background-color: #CEFAF5;">
              <td>Name</td>
              <td>Account No</td>
              <td>Email</td>
              <td>Phone No</td>
              <td>ID No</td>
              <td>Balance</td>
            </tr>
                <tr>
              <td>Nathan kiprotich ngenoh</td>
              <td><a href="customer.php?customer=535925">535925</a></td>
              <td>nate@gmail.com</td>
              <td>+254729667121</td>
              <td>28402117</td>
              <td>94173</td>
            </tr>
                <tr>
              <td>Evans chesang and makupi daniel</td>
              <td><a href="customer.php?customer=967842">967842</a></td>
              <td>account@tbank.co.ke</td>
              <td>+254724946499</td>
              <td>123456789</td>
              <td>489000</td>
            </tr>
                </table><br>
          <div align="center" id="pagination_controls"></div>
        </div>
        </div>
      </div>
    </div>
    <div class="tab-pane" id="viewatms">
      <div class="table-responsive"><br>
        <div>
                <p style="float:left">Page <b>1</b> of <b>1</b></p>
          <table class="table-hover" border="1" width="100%">
            <tr style="background-color: #CEFAF5;">
              <td>Account No</td>
              <td>Card Number</td>
              <td>PIN Number</td>
            </tr>
                <tr>
              <td>535925</td>
```

```
                <td>890148</td>
                <td>6567</td>
            </tr>
                        <tr>
                <td>967842</td>
                <td>181320</td>
                <td>3714</td>
            </tr>
                        </table><br>
            <div align="center" id="pagination_controls"></div>
          </div>
        </div>
      </div>
  </div>
</div>

<!-- Add administrator Modal -->
<div id="addAdminModal" class="modal fade" role="dialog">
  <div class="modal-dialog">
    <div class="modal-content">
      <div class="modal-header" style="background-color: #e7ecf2;">
        <button type="button" class="close" data-dismiss="modal"><font
color="red">&times;</font></button>
        <h4 class="modal-title" align="center" style="text-shadow: 3px 3px
3px #cfcfcf;">Add Admin Panel</h4>
      </div>
      <div class="modal-body">
        <br />
<b>Fatal error</b>:  require_once(): Failed opening required 'add_admin.php'
(include_path='.:/usr/share/pear:/usr/share/php') in
<b>/home/vhosts/pilot.6te.net/Admin/dashboard.php</b> on line <b>295</b><br
/>
<br><center><a target='_blank' href='http://www.freewebhostingarea.com'><img
src='http://users.freewebhostingarea.com/i/freehosting.png' border='0'
width='88'
height='15' alt='Free Web Hosting'></a></center>


<!DOCTYPE html>
<html>
<head>
     <title>Login | Customer</title>
    <meta http-equiv="X-UA-Compatible" content="IE=9" />
    <link rel="shortcut icon" href="./images/logo.jpg" type="image/png">
    <link rel="stylesheet"
href="./RESOURCES/bootstrap/dist/css/bootstrap.min.css">
    <link rel="stylesheet" href="css/strath.css">
    <script src="./RESOURCES/jquery/dist/jquery.min.js"></script>
    <script src="./RESOURCES/bootstrap/dist/js/bootstrap.min.js"></script>
    <link rel="stylesheet" href="css/index.css">

</head>
<body>
<div class="header">
</div>
<div align="center" class="login">
  <div style="height: 50px;">
```

```html
    <img src="images/logo.jpg" height="100%">
  </div>
  <h4>CLIENTS WITHDRAW</h4>
  <div class="loginform">
    <form class="form-horizontal " method="post" action="">
      <div class="form-group">
        <label class="control-label col-sm-3" for="account">Card
Number:</label>
        <div class="col-sm-9">
        <font color="red">*</font><input type="text" id="account"
name="account" placeholder="Enter your Card Number" value=""><br><br>
        </div>
      </div> <!-- End Form Group -->
      <div class="form-group">
        <label class="control-label col-sm-3" for="pin">PIN : </label>
        <div class="col-sm-9">
        <font color="red">*</font><input type="password" name="pin"
placeholder="Enter your PIN">
        </div>
      </div> <!-- End Form Group -->
      <div><br>
        <button class="btn btn-primary" type="submit" name="login"
style="height: 28px;">
        <span class="glyphicon glyphicon-user"></span> Submit</button>
      </div>
    </form>
  </div>
</div>
</body>
</html>
<div class="message">
  </div>


<!DOCTYPE html>

<html xmlns="http://www.w3.org/1999/xhtml" style="height:100%">
<head><link rel="shortcut icon" type="image/ico" href="favicon (4).ico"
/><meta http-equiv="content-type" content="text/html; charset=utf-8" /><meta
name="viewport" content="width=device-width, initial-scale=1.0, maximum-
scale=1.0, user-scalable=no" /><meta http-equiv="X-UA-Compatible"
content="IE=edge,chrome=1" /><title>
    Transnational Bank Limited | E-Account Opening Portal
</title><link href="js/lean.css" rel="stylesheet" />
    <script src="js/jquery.js"></script>


    <script src="js/pnotify.custom.min.js"></script>
    <link href="css/pnotify.custom.min.css" rel="stylesheet" />
    <script src="js/jquery.leanModal.min.js"></script>

    <link href="js/jquery-ui.css" rel="stylesheet" />
    <script src="js/jquery-ui.js"></script>



    <link rel="stylesheet" type="text/css" href="css/reset.css"
media="screen" /><link rel="stylesheet" type="text/css" href="css/text.css"
```

```
media="screen" /><link rel="stylesheet" type="text/css" href="css/grid.css"
media="screen" /><link rel="stylesheet" type="text/css" href="css/layout.css"
media="screen" /><link rel="stylesheet" type="text/css" href="css/nav.css"
media="screen" /><link href="css/style_v2.css" rel="stylesheet" /><link
href="css/pagination.css" rel="stylesheet" />




    <!--[if IE 6]><link rel="stylesheet" type="text/css" href="css/ie6.css"
media="screen" /><![endif]-->
    <!--[if IE 7]><link rel="stylesheet" type="text/css" href="css/ie.css"
media="screen" /><![endif]-->

    <!--Jquery UI CSS-->
    <link href="css/themes/base/jquery.ui.all.css" rel="stylesheet"
type="text/css" />
    <!-- BEGIN: load jquery -->


    <script src="js/jquery-ui/jquery.ui.widget.min.js"
type="text/javascript"></script>
    <script src="js/jquery-ui/jquery.ui.accordion.min.js"
type="text/javascript"></script>
    <script src="js/jquery-ui/jquery.effects.core.min.js"
type="text/javascript"></script>
    <script src="js/jquery-ui/jquery.effects.slide.min.js"
type="text/javascript"></script>
    <!-- END: load jquery -->
    <!--jQuery Date Picker-->
    <script src="js/jquery-ui/jquery.ui.widget.min.js"
type="text/javascript"></script>
    <script src="js/jquery-ui/jquery.ui.datepicker.min.js"
type="text/javascript"></script>
    <script src="js/jquery-ui/jquery.ui.progressbar.min.js"
type="text/javascript"></script>
    <!-- jQuery dialog related-->
    <script src="js/jquery-ui/external/jquery.bgiframe-2.1.2.js"
type="text/javascript"></script>
    <script src="js/jquery-ui/jquery.ui.mouse.min.js"
type="text/javascript"></script>
    <script src="js/jquery-ui/jquery.ui.draggable.min.js"
type="text/javascript"></script>




    <script src="js/jquery-ui/jquery.ui.resizable.min.js"
type="text/javascript"></script>
    <script src="js/jquery-ui/jquery.ui.dialog.min.js"
type="text/javascript"></script>
    <script src="js/jquery-ui/jquery.effects.core.min.js"
type="text/javascript"></script>
    <script src="js/jquery-ui/jquery.effects.blind.min.js"
type="text/javascript"></script>
```

```
    <script src="js/jquery-ui/jquery.effects.explode.min.js"
type="text/javascript"></script>
    <!-- jQuery dialog end here-->
    <script src="js/jquery-ui/jquery.ui.accordion.min.js"
type="text/javascript"></script>
    <!--Fancy Button-->

    <script src="js/setup.js" type="text/javascript"></script>
    <!-- Load TinyMCE -->
    <script src="js/tiny-mce/jquery.tinymce.js"
type="text/javascript"></script>
     <!-- /TinyMCE -->
    <style type="text/css">
        #progress-bar
        {
            width: 400px;
        }
    </style>
<script type="text/javascript">
//<![CDATA[
var theForm = document.forms['form1'];
if (!theForm) {
    theForm = document.form1;
}
function __doPostBack(eventTarget, eventArgument) {
    if (!theForm.onsubmit || (theForm.onsubmit() != false)) {
        theForm.__EVENTTARGET.value = eventTarget;
        theForm.__EVENTARGUMENT.value = eventArgument;
        theForm.submit();
    }
}
//]]>
</script>


        <div class="grid_12 header-repeat">
          <div id="branding">
              <div class="floatleft">
                  <img src="img/trans-logo.png" style="margin-top:-10px"
width="50" height="50" alt="Logo" />
                   <ul class="inline-ul floatright" style="margin-top:-
10px; margin-left:5px;">
                         <li>
                          The Enterprising Bank<br />
                         For Enterprising People<br />
                      <a  href="http://w w w . tnbl . c o . k e">w w w . t n b
l . c o . k e</a></li>
                         </ul>

              </div>


              <div class="floatright">
                  <div class="floatleft">
                      <img src="img/img-profile.jpg" alt="Profile Pic"
/></div>
```

```html
                    <div class="floatleft marginleft10">
                        <ul class="inline-ul floatleft">
                            <li>Hello Evans</li>
                            <li><a href="changepassword.aspx">Change
Password</a></li>
                            <li><a href="login.aspx">Logout</a></li>
                        </ul>
                        <br />
                        <span class="small grey">Last Login: 11/11/2016
5:50:56 AM</span>
                    </div>
                </div>

                <div class="floatright" style="width:50%">
                    <div class="floatleft">

                        <span class="grey" style="font-size: x-large;">TNBL E-
Account Opening Portal</span>
                        </div>
                        </div>


                <div class="clear">
                </div>
            </div>
        </div>
        <div class="clear">
        </div>
        <div class="grid_12">
            <ul class="nav main">

                <li class="ic-dashboard"><a
href="dashboard.aspx"><span>Dashboard</span></a> </li>


                 <li class="ic-gallery dd"><a
href="javascript:"><span>System</span></a>
                        <ul>

                        <li class="ic-gallery dd"><a
href="membersaudit.aspx"><span>Members Audit Trail  </span></a> </li>

                            <li class="ic-gallery dd"><a
href="usersaudit.aspx"><span>Users Audit Trail</span></a> </li>

                        </ul>
                </li>



                <li class="ic-gallery dd"><a
href="javascript:"><span>Members</span></a>
                        <ul>

                        <li class="ic-gallery dd"><a
href="agents.aspx"><span>Manage Members  </span></a> </li>
```
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```html
                        <li class="ic-gallery dd"><a
href="agentsapprovals.aspx"><span>Approve Member Requests</span></a> </li>

                        </ul>
                </li>

                <li class=" ic-gallery dd"><a href="accounts.aspx"><span>E-
Accounts</span></a> </li>

                <li class="ic-gallery dd"><a
href="javascript:"><span>Users</span></a>
                        <ul>

                        <li class="ic-gallery dd"><a
href="users.aspx"><span>Manage Users   </span></a> </li>

                        <li class="ic-gallery dd"><a
href="userapprovals.aspx"><span>Users Requests Pending</span></a> </li>

                        <li class="ic-gallery dd"><a
href="groups.aspx"><span>Manage Users Groups</span></a> </li>




                        </ul>
                </li>




                <li class=" ic-charts"><a href="#"><span>Reports</span></a>

                        <ul>


                        <li class="ic-gallery dd"><a
href="rptsuccessfullaccount.aspx"><span>Successfull E-Accounts</span></a>
</li>

                        <li class="ic-gallery dd"><a
href="rptpendingapprovals.aspx"><span>Request Pending Approvals</span></a>
</li>

                        <li class="ic-gallery dd"><a
href="rptfailslist.aspx"><span>Failed Accounts (List)  </span></a> </li>

                        <li class="ic-gallery dd"><a
href="rptfails.aspx"><span>Failed Accounts (Details) </span></a> </li>

                        <li class="ic-gallery dd"><a
href="rptaccountsopenedperagent.aspx"><span>E-Accounts Opened per
Member</span></a> </li>
```

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```
                              <li class="ic-gallery dd"><a
href="rptaccountopenedperdevice.aspx"><span>E-Accounts Opened per
Device</span></a> </li>

                              <li class="ic-gallery dd"><a
href="rptaccountsopenedperproduct.aspx"><span>E-Accounts Opened Per
Product</span></a> </li>

                    </ul>

              </li>


         </ul>
      </div>

   <div class="clear">
   </div>
               <script type="text/javascript">
//<![CDATA[
Sys.WebForms.PageRequestManager._initialize('ctl00$scriptmanger1', 'form1',
['tctl00$ContentPlaceHolder1$upCrudGrid','ContentPlaceHolder1_upCrudGrid','fc
tl00$ContentPlaceHolder1$rptfails$ReportViewer','','fctl00$ContentPlaceHolder
1$rptfails$DocMap','','fctl00$ContentPlaceHolder1$rptfails$ctl09$ReportArea',
''], [], ['ctl00$ContentPlaceHolder1$rptfails$ctl09$ReportControl$ctl00',''],
90, 'ctl00');
//]]>
</script>


    <div id="ContentPlaceHolder1_upCrudGrid" rules="None">


                   <div class="grid_12">
          <div class="box round first fullpage" style="background-color:
white; min-height:425px;">
                <h2>
                    TNBL E-Accounts | Pending Accounts Report</h2>
                <div class="block ">

                     <div style="display:block; text-align:left;">
                        <span>Start Date</span>
                        <input name="ctl00$ContentPlaceHolder1$txtDate1"
type="text" id="ContentPlaceHolder1_txtDate1" disabled="disabled"
class="aspNetDisabled form-control" value="" />
<input type="image" name="ctl00$ContentPlaceHolder1$imgPopup"
id="ContentPlaceHolder1_imgPopup" src="img/calendar.gif" align="bottom" />

                        <span>End Date</span>
                        <input name="ctl00$ContentPlaceHolder1$txtDate2"
type="text" id="ContentPlaceHolder1_txtDate2" disabled="disabled"
class="aspNetDisabled form-control" value="" />
<input type="image" name="ctl00$ContentPlaceHolder1$ImageButton1"
id="ContentPlaceHolder1_ImageButton1" src="img/calendar.gif" align="bottom"
/>

                        <span class="form-control">Select Branch</span>
```

```html
                                    <select name="ctl00$ContentPlaceHolder1$drpbranch"
id="ContentPlaceHolder1_drpbranch">
            <option value="ALL">ALL</option>
            <option value="001">NAIROBI</option>
            <option value="002">MOMBASA</option>
            <option value="003">ELDORET</option>
            <option value="004">NAKURU</option>
            <option value="005">MIA</option>
            <option value="006">J.K.I.A</option>
            <option value="007">KIRINYAGA RD.</option>
            <option value="008">KABARAK UNIVERSITY</option>
            <option value="009">OLENGURUONE</option>
            <option value="010">KERICHO</option>
            <option value="011">NANDIHILLS</option>
            <option value="012">EPZ - ATHI RIVER</option>
            <option value="013">SHEIKH KARUME RD.</option>
            <option value="014">KABARNET</option>
            <option value="015">KITALE</option>
            <option value="016">NAROK</option>
            <option value="017">BOMET</option>
            <option value="018">ITEN</option>
            <option value="019">LESSOS</option>
            <option value="020">FLAX</option>
            <option value="021">WESTLANDS</option>
            <option value="022">BURNT FOREST</option>
            <option value="023">KIPTAGICH</option>
            <option value="024">MARIGAT</option>

    </select>




 <input type="submit" name="ctl00$ContentPlaceHolder1$generate"
value="Generate Report" id="ContentPlaceHolder1_generate" class="btn btn-
green" style="margin-bottom: 10px" />


                    </div>
                                                            <tr>

      <td><input type="image"
name="ctl00$ContentPlaceHolder1$rptfails$ctl05$ctl00$Last$ctl01$ctl00"
disabled="disabled"
id="ctl00_ContentPlaceHolder1_rptfails_ctl05_ctl00_Last_ctl01_ctl00"
title="Last Page"
src="/TNB/Reserved.ReportViewerWebControl.axd?OpType=Resource&amp;Version=11.
0.3452.0&amp;Name=Microsoft.Reporting.WebForms.Icons.LastPageDisabled.gif"
alt="Last Page" style="border-
style:None;height:16px;width:16px;cursor:default;" /><input type="image"
name="ctl00$ContentPlaceHolder1$rptfails$ctl05$ctl00$Last$ctl01$ctl01"
disabled="disabled"
id="ctl00_ContentPlaceHolder1_rptfails_ctl05_ctl00_Last_ctl01_ctl01"
title="Last Page"
src="/TNB/Reserved.ReportViewerWebControl.axd?OpType=Resource&amp;Version=11.
0.3452.0&amp;Name=Microsoft.Reporting.WebForms.Icons.FirstPageDisabled.gif"
```

```
alt="Last Page" style="border-
style:None;height:16px;width:16px;display:none;cursor:default;" /></td>
                                                        </tr>
                                                    </table>
                                                </div>
                                            </div></td>
                                        </tr>
                                    </table>
                                </div><table cellpadding="0"
cellspacing="0" ToolbarSpacer="true" style="display:inline;width:20px;">
                                        <tr>
                                            <td></td>
                                        </tr>
                                    </table><div class=" "
style="display:inline;font-family:Verdana;font-size:8pt;vertical-align:top;">
                                        <table cellpadding="0"
cellspacing="0" style="display:inline;">
                                            <tr>
                                                <td height="28px"><div
id="ctl00_ContentPlaceHolder1_rptfails_ctl05_ctl01_ctl00">
                                                    <div
id="ctl00_ContentPlaceHolder1_rptfails_ctl05_ctl01_ctl00_ctl00"
style="display:none;border:1px transparent Solid;">
                                                        <table
title="Go back to the parent report">
                                                            <tr>

        <td><input type="image"
name="ctl00$ContentPlaceHolder1$rptfails$ctl05$ctl01$ctl00$ctl00$ctl00"
id="ctl00_ContentPlaceHolder1_rptfails_ctl05_ctl01_ctl00_ctl00_ctl00"
title="Go back to the parent report"
src="/TNB/Reserved.ReportViewerWebControl.axd?OpType=Resource&amp;Version=11.
0.3452.0&amp;Name=Microsoft.Reporting.WebForms.Icons.BackEnabled.gif" alt="Go
back to the parent report" style="border-style:None;height:16px;width:16px;"
/><input type="image"
name="ctl00$ContentPlaceHolder1$rptfails$ctl05$ctl01$ctl00$ctl00$ctl01"
id="ctl00_ContentPlaceHolder1_rptfails_ctl05_ctl01_ctl00_ctl00_ctl01"
title="Go back to the parent report"
src="/TNB/Reserved.ReportViewerWebControl.axd?OpType=Resource&amp;Version=11.
0.3452.0&amp;Name=Microsoft.Reporting.WebForms.Icons.BackRTLEnabled.gif"
alt="Go back to the parent report" style="border-
style:None;height:16px;width:16px;display:none;" /></td>
                                                            </tr>
                                                        </table>
                                                    </div><div
id="ctl00_ContentPlaceHolder1_rptfails_ctl05_ctl01_ctl00_ctl01"
class="aspNetDisabled" disabled="disabled" style="border:1px transparent
Solid;">
<table title="Go back to the parent report">
<tr>
<td><input type="image"
name="ctl00$ContentPlaceHolder1$rptfails$ctl05$ctl01$ctl00$ctl01$ctl00"
disabled="disabled"
id="ctl00_ContentPlaceHolder1_rptfails_ctl05_ctl01_ctl00_ctl01_ctl00"
title="Go back to the parent report"
src="/TNB/Reserved.ReportViewerWebControl.axd?OpType=Resource&amp;Version=11.
0.3452.0&amp;Name=Microsoft.Reporting.WebForms.Icons.BackDisabled.gif"
```

```
alt="Go back to the parent report" style="border-
style:None;height:16px;width:16px;cursor:default;" /><input type="image"
name="ctl00$ContentPlaceHolder1$rptfails$ctl05$ctl01$ctl00$ctl01$ctl01"
disabled="disabled"
id="ctl00_ContentPlaceHolder1_rptfails_ctl05_ctl01_ctl00_ctl01_ctl01"
title="Go back to the parent report"
src="/TNB/Reserved.ReportViewerWebControl.axd?OpType=Resource&amp;Version=11.
0.3452.0&amp;Name=Microsoft.Reporting.WebForms.Icons.BackRTLDisabled.gif"
alt="Go back to the parent report" style="border-
style:None;height:16px;width:16px;display:none;cursor:default;" /></td>
</tr>
</table>
</div>
</div></td>
</tr>
</table>
</div><table cellpadding="0" cellspacing="0" ToolbarSpacer="true"
style="display:inline;width:20px;">
<tr>
<td></td>
</tr>
</table><div class=" " style="display:inline;font-family:Verdana;font-
size:8pt;vertical-align:top;">
<table cellpadding="0" cellspacing="0" style="display:inline;">
<tr>
<td height="28px"><select
name="ctl00$ContentPlaceHolder1$rptfails$ctl05$ctl02$ctl00"
id="ctl00_ContentPlaceHolder1_rptfails_ctl05_ctl02_ctl00" disabled="disabled"
title="Zoom" class="aspNetDisabled" style="font-family:Verdana;font-
size:8pt;">
<option value="PageWidth">Page Width</option>
<option value="FullPage">Whole Page</option>
<option value="500">500%</option>
<option value="200">200%</option>
                                                        <option
value="150">150%</option>
                                                        <option
selected="selected" value="100">100%</option>
                                                        <option
value="75">75%</option>
                                                        <option
value="50">50%</option>
                                                        <option
value="25">25%</option>
                                                        <option
value="10">10%</option>
                                                </select></td>
                                        </tr>
                                </table>
                        </div><table cellpadding="0"
cellspacing="0" ToolbarSpacer="true" style="display:inline;width:20px;">
                                <tr>
                                        <td></td>
                                </tr>
                        </table><div class=" "
style="display:inline;font-family:Verdana;font-size:8pt;vertical-align:top;">
```

```html
                                                          <table cellpadding="0"
cellspacing="0" style="display:inline;">
                                                                <tr>
                                                                    <td
height="28px"><input
name="ctl00$ContentPlaceHolder1$rptfails$ctl05$ctl03$ctl00" type="text"
maxlength="255" size="10"
id="ctl00_ContentPlaceHolder1_rptfails_ctl05_ctl03_ctl00" disabled="disabled"
title="Find Text in Report" class="aspNetDisabled" style="font-
family:Verdana;font-size:8pt;" /></td><td width="4px"></td><td
height="28px"><a id="ctl00_ContentPlaceHolder1_rptfails_ctl05_ctl03_ctl01"
title="Find" href="#" style="font-family:Verdana;font-
size:8pt;color:Gray;text-decoration:none;white-
space:nowrap;">Find</a></td><td width="4px"></td><td height="28px"><span
style="font-family:Verdana;font-size:8pt;">|</span></td><td
width="4px"></td><td height="28px"><a
id="ctl00_ContentPlaceHolder1_rptfails_ctl05_ctl03_ctl03" title="Find Next"
href="#" style="font-family:Verdana;font-size:8pt;color:Gray;text-
decoration:none;white-space:nowrap;">Next</a></td>
                                                                </tr>
                                                            </table>
                                                        </div><table cellpadding="0"
cellspacing="0" ToolbarSpacer="true" style="display:inline;width:20px;">
                                                            <tr>
                                                                <td></td>
                                                            </tr>
                                                        </table><div class=" "
style="display:inline;font-family:Verdana;font-size:8pt;vertical-align:top;">
                                                            <table cellpadding="0"
cellspacing="0" style="display:inline;">
                                                                <tr>
                                                                    <td height="28px"><div
id="ctl00_ContentPlaceHolder1_rptfails_ctl05_ctl04_ctl00" style="font-
family:Verdana;font-size:8pt;border:1px transparent Solid;">
                                                                        <table
id="ctl00_ContentPlaceHolder1_rptfails_ctl05_ctl04_ctl00_Button"
title="Export drop down menu">
                                                                            <tr>

    <td><a
id="ctl00_ContentPlaceHolder1_rptfails_ctl05_ctl04_ctl00_ButtonLink"
title="Export drop down menu" alt="Export drop down menu"
href="javascript:void(0)" style="text-decoration:none;"><img
id="ctl00_ContentPlaceHolder1_rptfails_ctl05_ctl04_ctl00_ButtonImg"
src="/TNB/Reserved.ReportViewerWebControl.axd?OpType=Resource&amp;Version=11.
0.3452.0&amp;Name=Microsoft.Reporting.WebForms.Icons.ExportDisabled.gif"
alt="Export drop down menu" style="border-style:None;height:16px;width:16px;"
/><span style="width:5px;text-decoration:none;"> </span><img
id="ctl00_ContentPlaceHolder1_rptfails_ctl05_ctl04_ctl00_ButtonImgDown"
src="/TNB/Reserved.ReportViewerWebControl.axd?OpType=Resource&amp;Version=11.
0.3452.0&amp;Name=Microsoft.Reporting.WebForms.Icons.ArrowDownDisabled.gif"
alt="Export drop down menu" style="border-
style:None;height:6px;width:7px;margin-bottom:5px;" /></a></td>
                                                                            </tr>
                                                                        </table>
                                                                    </div><div
id="ctl00_ContentPlaceHolder1_rptfails_ctl05_ctl04_ctl00_Menu"
```

```
style="background-color:#ECE9D8;border:1px #336699
Solid;display:none;position:absolute;padding:1px;z-index:1;">
                                                         <div
style="border:1px transparent Solid;">
                                                            <a
title="Excel" alt="Excel"
onclick="$find(&#39;ctl00_ContentPlaceHolder1_rptfails&#39;).exportReport(&#3
9;EXCELOPENXML&#39;);" href="javascript:void(0)" style="color:#3366CC;font-
family:Verdana;font-size:8pt;padding:3px 8px 3px 8px;display:block;white-
space:nowrap;text-decoration:none;">Excel</a>
                                                         </div><div
style="border:1px transparent Solid;">
                                                            <a
title="PDF" alt="PDF"
onclick="$find(&#39;ctl00_ContentPlaceHolder1_rptfails&#39;).exportReport(&#3
9;PDF&#39;);" href="javascript:void(0)" style="color:#3366CC;font-
family:Verdana;font-size:8pt;padding:3px 8px 3px 8px;display:block;white-
space:nowrap;text-decoration:none;">PDF</a>
                                                         </div><div
style="border:1px transparent Solid;">
                                                            <a
title="Word" alt="Word"
onclick="$find(&#39;ctl00_ContentPlaceHolder1_rptfails&#39;).exportReport(&#3
9;WORDOPENXML&#39;);" href="javascript:void(0)" style="color:#3366CC;font-
family:Verdana;font-size:8pt;padding:3px 8px 3px 8px;display:block;white-
space:nowrap;text-decoration:none;">Word</a>
                                                         </div>
                                                      </div></td>
                                                   </tr>
                                                </table>
                                             </div><table cellpadding="0"
cellspacing="0" ToolbarSpacer="true" style="display:inline;width:6px;">
                                                <tr>
                                                   <td></td>
                                                </tr>
                                             </table><div class=" "
style="display:inline;font-family:Verdana;font-size:8pt;vertical-align:top;">
                                                <table cellpadding="0"
cellspacing="0" style="display:inline;">
                                                   <tr>
                                                      <td height="28px"><div
id="ctl00_ContentPlaceHolder1_rptfails_ctl05_ctl05_ctl00">
                                                         <div
id="ctl00_ContentPlaceHolder1_rptfails_ctl05_ctl05_ctl00_ctl00"
style="display:none;border:1px transparent Solid;">
                                                            <table
title="Refresh">
                                                               <tr>

      <td><input type="image"
name="ctl00$ContentPlaceHolder1$rptfails$ctl05$ctl05$ctl00$ctl00$ctl00"
title="Refresh"
src="/TNB/Reserved.ReportViewerWebControl.axd?OpType=Resource&amp;Version=11.
0.3452.0&amp;Name=Microsoft.Reporting.WebForms.Icons.Refresh.gif"
alt="Refresh" style="border-style:None;height:16px;width:16px;" /></td>
                                                               </tr>
                                                            </table>
```

```html
                                                         </div><div
id="ctl00_ContentPlaceHolder1_rptfails_ctl05_ctl05_ctl00_ctl01"
class="aspNetDisabled" disabled="disabled" style="border:1px transparent
Solid;">
                                                             <table
title="Refresh">
                                                                 <tr>

    <td><input type="image"
name="ctl00$ContentPlaceHolder1$rptfails$ctl05$ctl05$ctl00$ctl01$ctl00"
disabled="disabled" title="Refresh"
src="/TNB/Reserved.ReportViewerWebControl.axd?OpType=Resource&amp;Version=11.
0.3452.0&amp;Name=Microsoft.Reporting.WebForms.Icons.RefreshDisabled.gif"
alt="Refresh" style="border-
style:None;height:16px;width:16px;cursor:default;" /></td>
                                                                 </tr>
                                                             </table>
                                                         </div>
                                                     </div></td>
                                                 </tr>
                                             </table>
                                         </div><table cellpadding="0"
cellspacing="0" ToolbarSpacer="true" style="display:inline;width:6px;">
                                             <tr>
                                                 <td></td>
                                             </tr>
                                         </table><div class=" "
style="display:inline;font-family:Verdana;font-size:8pt;vertical-align:top;">
                                             <table cellpadding="0"
cellspacing="0" style="display:inline;">
                                                 <tr>
                                                     <td height="28px"><div
id="ctl00_ContentPlaceHolder1_rptfails_ctl05_ctl06_ctl00">
                                                         <div
id="ctl00_ContentPlaceHolder1_rptfails_ctl05_ctl06_ctl00_ctl00"
style="display:none;border:1px transparent Solid;">
                                                             <table
title="Print">
                                                                 <tr>

    <td><input type="image"
name="ctl00$ContentPlaceHolder1$rptfails$ctl05$ctl06$ctl00$ctl00$ctl00"
title="Print"
src="/TNB/Reserved.ReportViewerWebControl.axd?OpType=Resource&amp;Version=11.
0.3452.0&amp;Name=Microsoft.Reporting.WebForms.Icons.Print.gif" alt="Print"
style="border-style:None;height:16px;width:16px;" /></td>
                                                                 </tr>
                                                             </table>
                                                         </div><div
id="ctl00_ContentPlaceHolder1_rptfails_ctl05_ctl06_ctl00_ctl01"
class="aspNetDisabled" disabled="disabled" style="border:1px transparent
Solid;">
                                                             <table
title="Print">
                                                                 <tr>

    <td><input type="image"
```

```
name="ctl00$ContentPlaceHolder1$rptfails$ctl05$ctl06$ctl00$ctl01$ctl00"
disabled="disabled" title="Print"
src="/TNB/Reserved.ReportViewerWebControl.axd?OpType=Resource&amp;Version=11.
0.3452.0&amp;Name=Microsoft.Reporting.WebForms.Icons.PrintDisabled.gif"
alt="Print" style="border-style:None;height:16px;width:16px;cursor:default;"
/></td>
                                                                    </tr>
                                                                </table>
                                                            </div>
                                                        </div></td>
                                                    </tr>
                                                </table>
                                            </div>
                                        </div>
                                    </div></td>
                            </tr><tr>
                                <td style="vertical-
align:top;width:25%;height:100%;display:none;"><div
style="width:100%;height:100%;">
                                    <span
id="ctl00_ContentPlaceHolder1_rptfails_DocMap"><div
id="ctl00_ContentPlaceHolder1_rptfails_ctl08" style="display:none;">
                                        <input type="hidden"
name="ctl00$ContentPlaceHolder1$rptfails$ctl08$ClientClickedId"
id="ctl00_ContentPlaceHolder1_rptfails_ctl08_ClientClickedId" />
                                    </div></span>
                                </div></td><td
style="display:none;width:4px;padding:0px;margin:0px;height:100%;vertical-
align:middle;background-color:#ECE9D8;"><div
id="ctl00_ContentPlaceHolder1_rptfails_ctl07">
                                    <input type="image"
name="ctl00$ContentPlaceHolder1$rptfails$ctl07$img"
id="ctl00_ContentPlaceHolder1_rptfails_ctl07_img" title="Show / Hide Document
Map"
src="/TNB/Reserved.ReportViewerWebControl.axd?OpType=Resource&amp;Version=11.
0.3452.0&amp;Name=Microsoft.Reporting.WebForms.Icons.SplitterVertCollapse.png
" alt="Show / Hide Document Map" align="top" onclick="void(0);"
style="cursor:pointer;" /><input type="hidden"
name="ctl00$ContentPlaceHolder1$rptfails$ctl07$store"
id="ctl00_ContentPlaceHolder1_rptfails_ctl07_store" /><input type="hidden"
name="ctl00$ContentPlaceHolder1$rptfails$ctl07$collapse"
id="ctl00_ContentPlaceHolder1_rptfails_ctl07_collapse" value="false" />
                                </div></td><td style="height:100%;vertical-
align:top;"><div id="ctl00_ContentPlaceHolder1_rptfails_ctl09"
style="height:100%;width:100%;overflow:auto;position:relative;">
                                    <div
id="VisibleReportContentctl00_ContentPlaceHolder1_rptfails_ctl09"
style="height:100%;display:none;">

                                    </div><div
id="ctl00_ContentPlaceHolder1_rptfails_ctl09_ReportArea">
                                        <div
NewContentType="Microsoft.Reporting.WebFormsClient.ReportAreaContent.None"
ForNonReportContentArea="false"
id="ctl00_ContentPlaceHolder1_rptfails_ctl09_VisibilityState"
style="visibility:none;">
```

```html
                                                <input type="hidden"
name="ctl00$ContentPlaceHolder1$rptfails$ctl09$VisibilityState$ctl00"
value="None" />
                                        </div><input type="hidden"
name="ctl00$ContentPlaceHolder1$rptfails$ctl09$ScrollPosition"
id="ctl00_ContentPlaceHolder1_rptfails_ctl09_ScrollPosition" /><span
id="ctl00_ContentPlaceHolder1_rptfails_ctl09_Reserved_AsyncLoadTarget"></span
><div id="ctl00_ContentPlaceHolder1_rptfails_ctl09_ReportControl"
style="display:none;">
                                        <span></span><input type="hidden"
name="ctl00$ContentPlaceHolder1$rptfails$ctl09$ReportControl$ctl02" /><input
type="hidden"
name="ctl00$ContentPlaceHolder1$rptfails$ctl09$ReportControl$ctl03" /><input
type="hidden"
name="ctl00$ContentPlaceHolder1$rptfails$ctl09$ReportControl$ctl04"
id="ctl00_ContentPlaceHolder1_rptfails_ctl09_ReportControl_ctl04" value="100"
/>
                                        </div><div
id="ctl00_ContentPlaceHolder1_rptfails_ctl09_NonReportContent"
style="height:100%;width:100%;">

                                        </div>
                                    </div>
                            </div></td>
                    </tr>
            </table>
        </div></span>




                                    </div>
                </div>
                        </div>

</div>




    <div class="clear">
    </div>




    </div>


    <div style="height:30px;">
    </div>
    <div id="site_info" style="text-align: center; z-index:10000;
position:fixed;bottom:0;width:100%; "  >
```

```
                <p >&copy; Copyright 2015 - 2016  <a
href="http://www.softwareuniverse.co.ke">Software Universe Limited.</a>
                </p>
            </div>


<script type="text/javascript">
//<![CDATA[
Sys.Application.add_init(function() {
    $create(Sys.Extended.UI.CalendarBehavior,
{"button":$get("ContentPlaceHolder1_imgPopup"),"format":"dd/MMM/yyyy","id":"C
ontentPlaceHolder1_Calendar1"}, null, null,
$get("ContentPlaceHolder1_txtDate1"));
});
Sys.Application.add_init(function() {
    $create(Sys.Extended.UI.CalendarBehavior,
{"button":$get("ContentPlaceHolder1_ImageButton1"),"format":"dd/MMM/yyyy","id
":"ContentPlaceHolder1_CalendarExtender1"}, null, null,
$get("ContentPlaceHolder1_txtDate2"));
});
Sys.WebForms.PageRequestManager.getInstance()._registerDisposeScript("Content
PlaceHolder1_upCrudGrid",
"$find(\u0027ctl00_ContentPlaceHolder1_rptfails\u0027).dispose();");
Sys.Application.add_init(function() {

if (typeof Microsoft == 'undefined' ||
    typeof Microsoft.Reporting == 'undefined' ||
    typeof Microsoft.Reporting.WebFormsClient == 'undefined' ||
    typeof Microsoft.Reporting.WebFormsClient.ReportViewer == 'undefined')

Sys.UI.DomElement.setVisible($get('ctl00_ContentPlaceHolder1_rptfails_HttpHan
dlerMissingErrorMessage'), true);
    $create(Microsoft.Reporting.WebFormsClient.ReportViewer,
{"_internalViewerId":"ctl00_ContentPlaceHolder1_rptfails_ctl03","id":"ctl00_C
ontentPlaceHolder1_rptfails"}, null, null);
});
Sys.Application.add_init(function() {
    $create(Microsoft.Reporting.WebFormsClient._ScriptSwitchImage,
{"Image1":$get("ctl00_ContentPlaceHolder1_rptfails_ctl05_ctl00_First_ctl00"),
"Image2":$get("ctl00_ContentPlaceHolder1_rptfails_ctl05_ctl00_First_ctl01")},
null, null, $get("ctl00_ContentPlaceHolder1_rptfails_ctl05_ctl00_First"));
});
Sys.Application.add_init(function() {
    $create(Microsoft.Reporting.WebFormsClient._ScriptSwitchImage,
{"Image1":$get("ctl00_ContentPlaceHolder1_rptfails_ctl05_ctl05_ctl00_ctl00"),
"Image2":$get("ctl00_ContentPlaceHolder1_rptfails_ctl05_ctl05_ctl00_ctl01")},
null, null, $get("ctl00_ContentPlaceHolder1_rptfails_ctl05_ctl05_ctl00"));
});
Sys.Application.add_init(function() {
    $create(Microsoft.Reporting.WebFormsClient._HoverImage,
{"HoverStyles":{"CssClass":null,"Color":"#DDEEF7","Border":"1px #336699
Solid"},"NormalStyles":{"CssClass":null,"Color":"transparent","Border":"1px
transparent
Solid"},"OnClickScript":function(){__doPostBack('ctl00$ContentPlaceHolder1$rp
tfails$ctl05$ctl05$ctl00$ctl00','');}}, null, null,
$get("ctl00_ContentPlaceHolder1_rptfails_ctl05_ctl05_ctl00_ctl00"));
});
```

```html
</html>
<!DOCTYPE html>
<html lang="en">
<head><meta charset="utf-8" /><meta http-equiv="X-UA-Compatible"
content="IE=edge,chrome=1" /><meta name="viewport" content="width=device-
width" /><title>
        Chapaa Popote | Approvals
</title><script
src="/chapaapopote/bundles/modernizr?v=Aem7dn5ahnAKJwUMtiRmxMoYY783_xx6PkWT18
OFOR01"></script>
<link
href="/chapaapopote/Content/css?v=vrjBMSrfG8lxBWBOB92YcbYeDF32eyiNNyxXITHGd-
Q1" rel="stylesheet"/>
<link href="../favicon.ico" rel="shortcut icon" type="image/x-icon" /><meta
name="viewport" content="width=device-width" />
</head>
<body>
    <form method="post" action="./approvals" onsubmit="javascript:return
WebForm_OnSubmit();" id="ctl01" autocomplete="off">
<div class="aspNetHidden">
<input type="hidden" name="ctl10_HiddenField" id="ctl10_HiddenField" value=""
/>
<input type="hidden" name="__EVENTTARGET" id="__EVENTTARGET" value="" />
<input type="hidden" name="__EVENTARGUMENT" id="__EVENTARGUMENT" value="" />
<input type="hidden" name="__LASTFOCUS" id="__LASTFOCUS" value="" />
<input type="hidden" name="__VIEWSTATE" id="__VIEWSTATE"
value="1EqIxHflPBwO9DluO6RAx4dsfJEcrg0oKq8F4uoH/+Fbpfq19D7Wd7Rq5x76A+WPmAwHFY
NwV14/8AQ/YxpKi2+7MKt7MLcODcQwmZmn/0dZVWeiHGwipUoADa3uNIuUOCeZYizKT7aEMohoKYV
T5CQ4jcYAwZI9IvwmUBtGLUuXnS2NsZQYCRA/UwwY3etrmQJtjP/hlwWHZsP+MBUNkZXvX6GUL225
9xTMkwDneZVFiA0hok/KJr8wrfKdxvdInUubAAdfsY/7XxZZKtfJr3dKF96asHInR8Z5nsXGIxBiI
1FjziatgFNbMo00MMe+gMb8nE7+cSkrXzMmixN6S3wZlJRy98MKF25hM8WufGG745j32QwolOZeI5
Y5El20GeUm6iS2FLHEeLRViJGVuiJoEQU1sG2Qcw33F+/jvQ+nIuGSxhfB+yQQ4Obd+07jJe3u20+
s9QrzPcurocQebIT3g8JryicA+mKdOnXP4H1TjTfGO5DoNxKwmsr/n3DgzZZOjOTOV3xDRDLLhQNP
bpo8p3W9FSFfsFY336yfdrBxP6E5J/kwlkbMx512mF6xhbZ6BjEybz/EUamTgW4WEtMQVxVR5lCq1
nVZDLJkLBhShMoehFZGt7BYWJobodW3XRQXntdKS6qQOiAtITcg8A==" />
</div>

<script type="text/javascript">
//<![CDATA[
var theForm = document.forms['ctl01'];
if (!theForm) {
    theForm = document.ctl01;
}
function __doPostBack(eventTarget, eventArgument) {
    if (!theForm.onsubmit || (theForm.onsubmit() != false)) {
        theForm.__EVENTTARGET.value = eventTarget;
        theForm.__EVENTARGUMENT.value = eventArgument;
        theForm.submit();
    }
}
//]]>
</script>


<script
src="/chapaapopote/WebResource.axd?d=pynGkmcFUV13He1Qd6_TZMT_etwTgv_LgSMjLaN9
```

```
KBUQLo-CKTE3-d3aV3HC4eJAqb3lXDAKNDzfqRUliO3HUQ2&amp;t=635875620900000000"
type="text/javascript"></script>


<script
src="/chapaapopote/ScriptResource.axd?d=x6wALODbMJK5e0eRC_p1LawwM6hvR04FjWGgj
bcanRjYU6pEJiTZFBAi4QX2VBHFKGO1Lm0S2j6h4CF2EO4SYKgGD9yJgv_57PSiS7qckZub0b5er7
0wVQ_z4uGZD3u00&amp;t=7a2ecbb7" type="text/javascript"></script>
<script
src="/chapaapopote/ScriptResource.axd?d=P5lTttoqSeZXoYRLQMIScArTavPuwVUQ88KPW
-
RBZEfmlY4BLUDqEe5MX2jogC4tdikOKq2tSX6EG9zpIQYKfCzu5RKYNYTYywfOD5d7vNzEDsFekAt
om4xcM4h99jn80&amp;t=7a2ecbb7" type="text/javascript"></script>
<script src="../Scripts/jquery-1.8.2.min.js" type="text/javascript"></script>
<script src="../Scripts/jquery-ui-1.8.24.min.js"
type="text/javascript"></script>
<script
src="/chapaapopote/bundles/WebFormsJs?v=q9E9g87bUDaS624mcBuZsBaM8xn2E5zd-
f4FCdIk2cA1" type="text/javascript"></script>
<script type="text/javascript">
//<![CDATA[
function WebForm_OnSubmit() {
null;
return true;
}
//]]>
</script>

<div class="aspNetHidden">

    <input type="hidden" name="__VIEWSTATEGENERATOR"
id="__VIEWSTATEGENERATOR" value="368B2D42" />
    <input type="hidden" name="__EVENTVALIDATION" id="__EVENTVALIDATION"
value="WQos1T4HfNp9omPKRavc1RsEYLSoAhZHpQzrBOBzJ2CtEOyM3QjlmK9QmSlv3JYkLLARJP
nuj9sp2gG1TY3U3qW3WbKv+uGHPDXctBPN3k2j4bugp3Vo8JXIntrJ9VwRKdbcuIYzmO/grWKeVhi
jfFl7RwvrGve079awoqjNmNK8gGMpOuyeK+swgneJtzNC" />
</div>
        <script type="text/javascript">
//<![CDATA[
Sys.WebForms.PageRequestManager._initialize('ctl00$ctl10', 'ctl01',
['tctl00$UpdatePanel1','UpdatePanel1'], [], [], 90, 'ctl00');
//]]>
</script>

        <div id="minHeight"></div>
        <!--Dummy float for Opera and IE8 min-height fix-->
        <div id="wrap">
            <!-- header-->
            <header>
                <div class="logo">
                    <div id="logowrap">
                        <img id="Image1" class="fl"
src="../images/chapaa.jpg" alt="Test Bench" />
                        <div class="padder">
                            <h1>Web Portal</h1>
                        </div>
                    </div>
```

```html
                  </div>
                  <div class="loginDisplay">

                              Welcome
                              <span
id="HeadLoginView_UName">EVANS,</span></span> |
                              <a id="HeadLoginView_HeadLoginStatus"
href="javascript:__doPostBack(&#39;ctl00$HeadLoginView$HeadLoginStatus$ctl00&
#39;,&#39;&#39;)">Sign Out</a>
                                 |

                  </div>
                  <div class="clear"></div>
              </header>
              <nav>
                  <ul>
                      <li>
                          <a id="Home" href="../">Home</a></li>

                                      <li>
                                          <a id="LoginView1_changepass"
href="../account/ChangePassword.aspx">Change Password</a></li>
                                      <li>
                                          <a id="LoginView1_check"
href="approvals.aspx">Approvals</a></li>
                                      <li>
                                          <a id="LoginView1_opr"
href="operations.aspx">Operations</a></li>

                      </ul>
                  </nav>
                  <div class="clear"></div>
                  <div id="UpdatePanel1">

                          <section id="content">

    <div class="centre" style="width: 940px;">
        <div class="centreDiv" style="width: 500px;">
            <h5>Choose an Account from the Dropdown List:</h5>
            <select name="ctl00$MainContent$ddlUnchecked"
onchange="javascript:setTimeout(&#39;__doPostBack(\&#39;ctl00$MainContent$ddl
Unchecked\&#39;,\&#39;\&#39;)&#39;, 0)" id="MainContent_ddlUnchecked">
            <option selected="selected" value="Choose...">Choose...</option>
            <option value="510MSH00004707870000000100000000">JANET JEPKORIR
KANGOGO</option>

        </select>

            <div class="centreDiv" style="width: 400px;">

            </div>
        </div>
        <div class="clear"></div>

    </div>

                  </section>
```

```
                    <div class="clear"></div>

</div>
              <div id="UpdateProgress1" style="display:none;">

                    <img id="ajax" src="../images/ajax-loader.gif"
alt="Loading..." align="middle" />

</div>
        </div>
        <!-- footer -->
        <footer id="footer">
            <p>
                &copy;2010 - 2016 Trans National Bank Ltd.<sup>&reg;</sup> |
All Rights Reserved | Designed & Maintained by
                <a style="color: #DD9C2D;"
href="mailto:kolala@softwareuniverse.co.ke">Software Universe
Ltd.<sup>&reg;</sup></a>
            </p>
        </footer>


<script type="text/javascript">
//<![CDATA[
(function() {var fn = function() {$get("ctl10_HiddenField").value =
'';Sys.Application.remove_init(fn);};Sys.Application.add_init(fn);})();Sys.Ap
plication.add_init(function() {
    $create(Sys.UI._UpdateProgress,
{"associatedUpdatePanelId":"UpdatePanel1","displayAfter":10,"dynamicLayout":t
rue}, null, null, $get("UpdateProgress1"));
});
//]]>
</script>
</form>
</body>
</html>
<!DOCTYPE html>

<html xmlns="http://www.w3.org/1999/xhtml" style="height:100%">
<head><link rel="shortcut icon" type="image/ico" href="favicon (4).ico"
/><meta http-equiv="content-type" content="text/html; charset=utf-8" /><meta
name="viewport" content="width=device-width, initial-scale=1.0, maximum-
scale=1.0, user-scalable=no" /><meta http-equiv="X-UA-Compatible"
content="IE=edge,chrome=1" /><title>
      Transnational Bank Limited | E-Account Opening Portal
</title><link href="js/lean.css" rel="stylesheet" />
    <script src="js/jquery.js"></script>


    <script src="js/pnotify.custom.min.js"></script>
    <link href="css/pnotify.custom.min.css" rel="stylesheet" />
    <script src="js/jquery.leanModal.min.js"></script>

    <link href="js/jquery-ui.css" rel="stylesheet" />
    <script src="js/jquery-ui.js"></script>
```

```
    <link rel="stylesheet" type="text/css" href="css/reset.css"
media="screen" /><link rel="stylesheet" type="text/css" href="css/text.css"
media="screen" /><link rel="stylesheet" type="text/css" href="css/grid.css"
media="screen" /><link rel="stylesheet" type="text/css" href="css/layout.css"
media="screen" /><link rel="stylesheet" type="text/css" href="css/nav.css"
media="screen" /><link href="css/style_v2.css" rel="stylesheet" /><link
href="css/pagination.css" rel="stylesheet" />




    <!--[if IE 6]><link rel="stylesheet" type="text/css" href="css/ie6.css"
media="screen" /><![endif]-->
    <!--[if IE 7]><link rel="stylesheet" type="text/css" href="css/ie.css"
media="screen" /><![endif]-->

    <!--Jquery UI CSS-->
    <link href="css/themes/base/jquery.ui.all.css" rel="stylesheet"
type="text/css" />
    <!-- BEGIN: load jquery -->


    <script src="js/jquery-ui/jquery.ui.widget.min.js"
type="text/javascript"></script>
    <script src="js/jquery-ui/jquery.ui.accordion.min.js"
type="text/javascript"></script>
    <script src="js/jquery-ui/jquery.effects.core.min.js"
type="text/javascript"></script>
    <script src="js/jquery-ui/jquery.effects.slide.min.js"
type="text/javascript"></script>
    <!-- END: load jquery -->
    <!--jQuery Date Picker-->
    <script src="js/jquery-ui/jquery.ui.widget.min.js"
type="text/javascript"></script>
    <script src="js/jquery-ui/jquery.ui.datepicker.min.js"
type="text/javascript"></script>
    <script src="js/jquery-ui/jquery.ui.progressbar.min.js"
type="text/javascript"></script>
    <!-- jQuery dialog related-->
    <script src="js/jquery-ui/external/jquery.bgiframe-2.1.2.js"
type="text/javascript"></script>
    <script src="js/jquery-ui/jquery.ui.mouse.min.js"
type="text/javascript"></script>
    <script src="js/jquery-ui/jquery.ui.draggable.min.js"
type="text/javascript"></script>




    <script src="js/jquery-ui/jquery.ui.resizable.min.js"
type="text/javascript"></script>
    <script src="js/jquery-ui/jquery.ui.dialog.min.js"
type="text/javascript"></script>
    <script src="js/jquery-ui/jquery.effects.core.min.js"
type="text/javascript"></script>
```

```html
    <script src="js/jquery-ui/jquery.effects.blind.min.js"
type="text/javascript"></script>
    <script src="js/jquery-ui/jquery.effects.explode.min.js"
type="text/javascript"></script>
    <!-- jQuery dialog end here-->
    <script src="js/jquery-ui/jquery.ui.accordion.min.js"
type="text/javascript"></script>
    <!--Fancy Button-->

    <script src="js/setup.js" type="text/javascript"></script>
    <!-- Load TinyMCE -->
    <script src="js/tiny-mce/jquery.tinymce.js"
type="text/javascript"></script>




    <!-- /TinyMCE -->
    <style type="text/css">
        #progress-bar
        {
            width: 400px;
        }
    </style>

    <style>
        li { z-index: 9999; }
    </style>

    <div class="container_12">
                    <div class="clear">
    </div>
        <div class="grid_12 header-repeat">
            <div id="branding">
                <div class="floatleft">
                    <img src="img/trans-logo.png" style="margin-top:-10px"
width="50" height="50" alt="Logo" />
                    <ul class="inline-ul floatright" style="margin-top:-
10px; margin-left:5px;">
                            <li>
                             The Enterprising Bank<br />
                            For Enterprising People<br />
                        <a  href="http://w w w . tnbl . c o . k e">w w w . t n b
l . c o . k e</a></li>
                            </ul>

                </div>



                <div class="floatright">
                    <div class="floatleft">
                        <img src="img/img-profile.jpg" alt="Profile Pic"
/></div>
                    <div class="floatleft marginleft10">
                        <ul class="inline-ul floatleft">
                            <li>Hello Evans</li>
```

```
                                    <li><a href="changepassword.aspx">Change
Password</a></li>
                                    <li><a href="login.aspx">Logout</a></li>
                            </ul>
                            <br />
                            <span class="small grey">Last Login: 11/11/2016
5:50:56 AM</span>
                        </div>
                    </div>

                    <div class="floatright" style="width:50%">
                        <div class="floatleft">

                            <span class="grey" style="font-size: x-large;">TNBL E-
Account Opening Portal</span>
                            </div>
                            </div>


                    <div class="clear">
                    </div>
                </div>
            </div>
            <div class="clear">
            </div>
            <div class="grid_12">
                <ul class="nav main">

                    <li class="ic-dashboard"><a
href="dashboard.aspx"><span>Dashboard</span></a> </li>


                      <li class="ic-gallery dd"><a
href="javascript:"><span>System</span></a>
                            <ul>

                            <li class="ic-gallery dd"><a
href="membersaudit.aspx"><span>Members Audit Trail  </span></a> </li>

                                <li class="ic-gallery dd"><a
href="usersaudit.aspx"><span>Users Audit Trail</span></a> </li>

                            </ul>
                    </li>



                    <li class="ic-gallery dd"><a
href="javascript:"><span>Members</span></a>
                            <ul>

                            <li class="ic-gallery dd"><a
href="agents.aspx"><span>Manage Members  </span></a> </li>

                                <li class="ic-gallery dd"><a
href="agentsapprovals.aspx"><span>Approve Member Requests</span></a> </li>
```

```
                </ul>
        </li>

        <li class=" ic-gallery dd"><a href="accounts.aspx"><span>E-
Accounts</span></a> </li>

        <li class="ic-gallery dd"><a
href="javascript:"><span>Users</span></a>
                <ul>

                <li class="ic-gallery dd"><a
href="users.aspx"><span>Manage Users   </span></a> </li>

                <li class="ic-gallery dd"><a
href="userapprovals.aspx"><span>Users Requests Pending</span></a> </li>

                <li class="ic-gallery dd"><a
href="groups.aspx"><span>Manage Users Groups</span></a> </li>

                </ul>
        </li>

        <li class=" ic-charts"><a href="#"><span>Reports</span></a>

                <ul>

                <li class="ic-gallery dd"><a
href="rptsuccessfullaccount.aspx"><span>Successfull E-Accounts</span></a>
</li>

                <li class="ic-gallery dd"><a
href="rptpendingapprovals.aspx"><span>Request Pending Approvals</span></a>
</li>

                <li class="ic-gallery dd"><a
href="rptfailslist.aspx"><span>Failed Accounts (List)  </span></a> </li>

                <li class="ic-gallery dd"><a
href="rptfails.aspx"><span>Failed Accounts (Details) </span></a> </li>

                <li class="ic-gallery dd"><a
href="rptaccountsopenedperagent.aspx"><span>E-Accounts Opened per
Member</span></a> </li>

                <li class="ic-gallery dd"><a
href="rptaccountopenedperdevice.aspx"><span>E-Accounts Opened per
Device</span></a> </li>
```

```
                            <li class="ic-gallery dd"><a
href="rptaccountsopenedperproduct.aspx"><span>E-Accounts Opened Per
Product</span></a> </li>

                      </ul>

              </li>


          </ul>
      </div>

  <div class="clear">
  </div>
                  <script type="text/javascript">
//<![CDATA[
Sys.WebForms.PageRequestManager._initialize('ctl00$scriptmanger1', 'form1',
['tctl00$ContentPlaceHolder1$upCrudGrid','ContentPlaceHolder1_upCrudGrid'],
[], [], 90, 'ctl00');
//]]>
</script>


   <div id="ContentPlaceHolder1_upCrudGrid" rules="None">


              <div class="grid_12">
          <div class="box round first fullpage" style="background-color:
white; min-height:425px;">
              <h2>
                  TNBL E-Accounts</h2>
              <div class="input-group custom-search-form">
                              <input
name="ctl00$ContentPlaceHolder1$txtsearch" type="text"
id="ContentPlaceHolder1_txtsearch" class="form-control" placeholder="Search
by Account Number,Telephone" style="width:20%;" />
                              <span class="input-group-btn">
                          <input type="submit"
name="ctl00$ContentPlaceHolder1$btnsearch" value="Search"
id="ContentPlaceHolder1_btnsearch" class="btn btn-default fa-search"
type="button" style="width:5%;" />
                              </span>
                          </div>
              <div class="block ">

  <div>
          <table class="data display datatable even" cellspacing="0"
rules="None" id="ContentPlaceHolder1_GridView1" style="border-
width:0px;border-style:None;border-collapse:collapse;">
              <tr>
                  <th class="sorting " scope="col">Rec Number</th><th
class="sorting " scope="col">Processed</th><th class="sorting "
scope="col">Account Number</th><th class="sorting " scope="col">Product
Type</th><th class="sorting " scope="col">Activated?</th><th class="sorting "
scope="col">Activation Date</th><th class="sorting " scope="col">Received
Date</th><th class="sorting " scope="col">Surname</th><th class="sorting "
```

```
scope="col">First Name</th><th class="sorting " scope="col">Second
Name</th><th class="sorting " scope="col">Telephone</th><th class="sorting "
scope="col">MPesa Name</th><th class="sorting " scope="col"> </th>
                    </tr><tr>
                        <td>153367</td><td>False</td><td> </td><td>TNB
HAZINA
ACCOUNTS</td><td> </td><td> </td><td> </td><td>KOROS</td><td>J
OSEPH</td><td>KIPLANGAT</td><td>0720670282</td><td> </td><td><input
type="button" value="Details"
onclick="javascript:__doPostBack(&#39;ctl00$ContentPlaceHolder1$GridView1&#39
;,&#39;detailer$0&#39;)" class="btn btn-small" /></td>
                    </tr><tr>
                        <td>153366</td><td>True</td><td> </td><td>TNB
HAZINA ACCOUNTS</td><td> </td><td> </td><td>11/2/2016 10:15:42
AM</td><td>MUTHAMA</td><td>MERCY </td><td>NDUKU
</td><td>0705028224</td><td> </td><td><input type="button"
value="Details"
onclick="javascript:__doPostBack(&#39;ctl00$ContentPlaceHolder1$GridView1&#39
;,&#39;detailer$1&#39;)" class="btn btn-small" /></td>
                    </tr><tr>
                        <td>153365</td><td>True</td><td> </td><td>TNB
HAZINA ACCOUNTS</td><td> </td><td> </td><td>11/2/2016 8:59:09
AM</td><td>KURGAT</td><td>HILLARY
</td><td>KIPRUTO</td><td>0727565545</td><td> </td><td><input
type="button" value="Details"
onclick="javascript:__doPostBack(&#39;ctl00$ContentPlaceHolder1$GridView1&#39
;,&#39;detailer$2&#39;)" class="btn btn-small" /></td>
                    </tr><tr>
                        <td>153364</td><td>True</td><td> </td><td>TNB
HAZINA ACCOUNTS</td><td> </td><td> </td><td>11/1/2016 2:36:04
PM</td><td>OREYO</td><td>HELLEN</td><td>AGOLLAH</td><td>0710874739</td><td>&n
bsp;</td><td><input type="button" value="Details"
onclick="javascript:__doPostBack(&#39;ctl00$ContentPlaceHolder1$GridView1&#39
;,&#39;detailer$3&#39;)" class="btn btn-small" /></td>
                    </tr><tr>
                        <td>153363</td><td>True</td><td> </td><td>TNB
HAZINA ACCOUNTS</td><td> </td><td> </td><td>11/1/2016 12:22:58
PM</td><td>KOECH</td><td>LEDISHA</td><td>JEPKEMEI</td><td>0714758258</td><td>
 </td><td><input type="button" value="Details"
onclick="javascript:__doPostBack(&#39;ctl00$ContentPlaceHolder1$GridView1&#39
;,&#39;detailer$4&#39;)" class="btn btn-small" /></td>
                    </tr><tr>
                        <td>153362</td><td>True</td><td> </td><td>TNB
HAZINA ACCOUNTS</td><td> </td><td> </td><td>11/1/2016 11:52:22
AM</td><td>SAWE</td><td>BENSON</td><td>KIPTOO</td><td>0724178193</td><td>&nbs
p;</td><td><input type="button" value="Details"
onclick="javascript:__doPostBack(&#39;ctl00$ContentPlaceHolder1$GridView1&#39
;,&#39;detailer$5&#39;)" class="btn btn-small" /></td>
                    </tr><tr>
                        <td>153361</td><td>True</td><td> </td><td>TNB
HAZINA ACCOUNTS</td><td> </td><td> </td><td>11/1/2016 11:29:35
AM</td><td>CHEMWOLO</td><td>IRENE</td><td>JERONO</td><td>0722739355</td><td>&
nbsp;</td><td><input type="button" value="Details"
onclick="javascript:__doPostBack(&#39;ctl00$ContentPlaceHolder1$GridView1&#39
;,&#39;detailer$6&#39;)" class="btn btn-small" /></td>
                    </tr><tr>
```

```
                                        <td>153360</td><td>True</td><td> </td><td>TNB
HAZINA ACCOUNTS</td><td> </td><td> </td><td>11/1/2016 11:08:44
AM</td><td>MAIYO</td><td>MARGARET</td><td>MAGDALINE</td><td>0726112796</td><t
d> </td><td><input type="button" value="Details"
onclick="javascript:__doPostBack(&#39;ctl00$ContentPlaceHolder1$GridView1&#39
;,&#39;detailer$7&#39;)" class="btn btn-small" /></td>
                        </tr><tr>
                                        <td>153359</td><td>False</td><td> </td><td>TNB
HAZINA
ACCOUNTS</td><td> </td><td> </td><td> </td><td>KIPCHOGE</td><t
d>SILAS</td><td>SOMEK</td><td>0703564149</td><td> </td><td><input
type="button" value="Details"
onclick="javascript:__doPostBack(&#39;ctl00$ContentPlaceHolder1$GridView1&#39
;,&#39;detailer$8&#39;)" class="btn btn-small" /></td>
                        </tr><tr>
                                        <td>153358</td><td>True</td><td> </td><td>TNB
HAZINA ACCOUNTS</td><td> </td><td> </td><td>10/31/2016 12:47:44
PM</td><td>KAMAU</td><td>PENINAH</td><td>WANJA</td><td>0712627268</td><td>&nb
sp;</td><td><input type="button" value="Details"
onclick="javascript:__doPostBack(&#39;ctl00$ContentPlaceHolder1$GridView1&#39
;,&#39;detailer$9&#39;)" class="btn btn-small" /></td>
                        </tr><tr>
                                        <td>153357</td><td>True</td><td> </td><td>TNB
HAZINA ACCOUNTS</td><td> </td><td> </td><td>10/31/2016 12:42:41
PM</td><td>TOO</td><td>KELVIN</td><td>KIPKORIR</td><td>0712627268</td><td>&nb
sp;</td><td><input type="button" value="Details"
onclick="javascript:__doPostBack(&#39;ctl00$ContentPlaceHolder1$GridView1&#39
;,&#39;detailer$10&#39;)" class="btn btn-small" /></td>
                        </tr><tr>
                                        <td>153356</td><td>True</td><td> </td><td>TNB
HAZINA ACCOUNTS</td><td> </td><td> </td><td>10/31/2016 12:28:29
PM</td><td>KIGEN</td><td>WILLIAM</td><td>KIPNGETICH</td><td>0720848486</td><t
d> </td><td><input type="button" value="Details"
onclick="javascript:__doPostBack(&#39;ctl00$ContentPlaceHolder1$GridView1&#39
;,&#39;detailer$11&#39;)" class="btn btn-small" /></td>
                        </tr><tr>
                                        <td>153355</td><td>True</td><td> </td><td>TNB
HAZINA ACCOUNTS</td><td> </td><td> </td><td>10/31/2016 10:44:27
AM</td><td>TOROITICH</td><td>LONAH</td><td>JEPKORIR</td><td>0701300004</td><t
d> </td><td><input type="button" value="Details"
onclick="javascript:__doPostBack(&#39;ctl00$ContentPlaceHolder1$GridView1&#39
;,&#39;detailer$12&#39;)" class="btn btn-small" /></td>
                        </tr><tr>
                                        <td>153354</td><td>True</td><td> </td><td>TNB
HAZINA ACCOUNTS</td><td> </td><td> </td><td>10/31/2016 10:12:57
AM</td><td>ROTICH</td><td>LEONARD</td><td>KIPTOO</td><td>0718241592</td><td>&
nbsp;</td><td><input type="button" value="Details"
onclick="javascript:__doPostBack(&#39;ctl00$ContentPlaceHolder1$GridView1&#39
;,&#39;detailer$13&#39;)" class="btn btn-small" /></td>
                        </tr><tr>
                                        <td>153353</td><td>True</td><td> </td><td>TNB
HAZINA ACCOUNTS</td><td> </td><td> </td><td>10/31/2016 9:39:44
AM</td><td>ROTICH</td><td>LEONARD</td><td>KIPTOO</td><td>0718241592</td><td>&
nbsp;</td><td><input type="button" value="Details"
onclick="javascript:__doPostBack(&#39;ctl00$ContentPlaceHolder1$GridView1&#39
;,&#39;detailer$14&#39;)" class="btn btn-small" /></td>
                        </tr><tr class="pagination-ys">
```

```
                    <td colspan="13"><table>
                        <tr>
                            <td><span>1</span></td><td><a
href="javascript:__doPostBack(&#39;ctl00$ContentPlaceHolder1$GridView1&#39;,&
#39;Page$2&#39;)">2</a></td><td><a
href="javascript:__doPostBack(&#39;ctl00$ContentPlaceHolder1$GridView1&#39;,&
#39;Page$3&#39;)">3</a></td><td><a
href="javascript:__doPostBack(&#39;ctl00$ContentPlaceHolder1$GridView1&#39;,&
#39;Page$4&#39;)">4</a></td><td><a
href="javascript:__doPostBack(&#39;ctl00$ContentPlaceHolder1$GridView1&#39;,&
#39;Page$5&#39;)">5</a></td><td><a
href="javascript:__doPostBack(&#39;ctl00$ContentPlaceHolder1$GridView1&#39;,&
#39;Page$6&#39;)">6</a></td><td><a
href="javascript:__doPostBack(&#39;ctl00$ContentPlaceHolder1$GridView1&#39;,&
#39;Page$7&#39;)">7</a></td><td><a
href="javascript:__doPostBack(&#39;ctl00$ContentPlaceHolder1$GridView1&#39;,&
#39;Page$8&#39;)">8</a></td><td><a
href="javascript:__doPostBack(&#39;ctl00$ContentPlaceHolder1$GridView1&#39;,&
#39;Page$9&#39;)">9</a></td><td><a
href="javascript:__doPostBack(&#39;ctl00$ContentPlaceHolder1$GridView1&#39;,&
#39;Page$10&#39;)">10</a></td><td><a
href="javascript:__doPostBack(&#39;ctl00$ContentPlaceHolder1$GridView1&#39;,&
#39;Page$11&#39;)">...</a></td>
                        </tr>
                    </table></td>
                </tr>
            </table>
      </div>
                        </div>
                </div>
            </div>
                    <div class="clear">
    </div>

</div>

    <style>

    tr{ height: 30px;
line-height: 30px; border-bottom:1px solid #e6e6e6;}
     tr:hover { background:#f6f6f6; }
     tr td{ padding-left:5px; }

    </style>




    <div class="clear">
    </div>




    </div>
```

```
    <div style="height:30px;">
    </div>
     <div id="site_info" style="text-align: center; z-index:10000;
position:fixed;bottom:0;width:100%; "  >
            <p >&copy; Copyright 2015 - 2016  <a
href="http://www.softwareuniverse.co.ke">Software Universe Limited.</a>
            </p>
        </div>
    </form>
</body>

</html>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
<html xmlns="http://www.w3.org/1999/xhtml" xml:lang="en" lang="en">
<meta name="viewport" content="width=device-width, initial-scale=1.0, user-
scalable=0, minimum-scale=1.0, maximum-scale=1.0">
<!-- Default layout -->
<head>
    <meta http-equiv="Content-Type" content="text/html;charset=utf-8" />
<meta http-equiv="Viewport" content="width=device-width, initial-scale=1.0"
/><link href="/img/favicon.png" rel="shortcut icon" type="image/x-icon" />
<link href="/css/bootstrap.min.css" media="screen" rel="stylesheet"
type="text/css" />
<link
href="https://fonts.googleapis.com/css?family=Lato:300,400,400italic,600,700|
Raleway:300,400,500,600,700|Crete+Round:400italic" media="screen"
rel="stylesheet" type="text/css" />
<link href="/css/application.css" media="screen" rel="stylesheet"
type="text/css" />
<link href="/css/jquery-ui.min.css" media="screen" rel="stylesheet"
type="text/css" />
<link href="/css/doc.css" media="screen" rel="stylesheet" type="text/css" />
<link href="/css/fontawesome/css/font-awesome.min.css" media="screen"
rel="stylesheet" type="text/css" />
<link href="/css/themify-icons/themify-icons.min.css" media="screen"
rel="stylesheet" type="text/css" />
<link href="/js/account/datepicker/styles/datepicker.css" media="screen"
rel="stylesheet" type="text/css" />
<link href="/css/update.css" media="screen" rel="stylesheet" type="text/css"
/><title>Africastalking.com - SMS - SMPP Accounts</title>
</head>

<body>

    <header class="navbar navbar-default navbar-static-top">

    <!-- start: NAVBAR HEADER -->
    <div class="navbar-header">
        <a href="#" class="sidebar-mobile-toggler pull-left hidden-md hidden-
lg" data-toggle-class="app-slide-off" data-toggle-target="#app" data-toggle-
click-outside="#sidebar">
            <i class="ti-align-justify"></i>
        </a>
        <a class="navbar-brand" href="https://www.africastalking.com">
```

```html
        <img src="/img/logo.png" alt="Africa's Talking"/>
    </a>
    <a href="#" class="sidebar-toggler pull-right visible-md visible-lg"
data-toggle-class="app-sidebar-closed" data-toggle-target="#app">
        <i class="ti-align-justify"></i>
    </a>
    <a class="pull-right menu-toggler visible-xs-block" id="menu-toggler"
data-toggle="collapse" href=".navbar-collapse">
        <span class="sr-only">Toggle navigation</span>
        <i class="ti-view-grid"></i>
    </a>
</div>
<!-- end: NAVBAR HEADER -->

<!-- start: NAVBAR COLLAPSE -->
<div class="navbar-collapse collapse">

    <ul class="nav navbar-right" style="min-width:350px">
        <!-- start: Home -->
        <li class="dropdown">
            <a href="http://www.africastalking.com">
                <span class="dot-badge partition-red"></span> <i
class="ti-home"></i> <span>Home</span>
            </a>
        </li>
        <!-- end: Home -->

        <!-- start: My Account  -->

            <li class="dropdown">
                <a href="/settings">
                    <i class="ti-user"></i><span
>[ evanskimutai ]</span>
                </a>
            </li>
             
            <li class="dropdown">
                <a href="/logout">
                    <i class="ti-lock"></i><span>Log out</span>
                </a>
            </li>

                <!-- end: My Accounts  -->

        <!-- start: Docs SWITCHER -->
        <li class="dropdown">
            <a href="http://docs.africastalking.com" target="_blank">
                <i class="ti-book"></i> Docs
            </a>

        </li>
        <!-- start: LANGUAGE SWITCHER -->
    </ul>

            <!--<div class="nav navbar-right" style="margin:20px 40px">--
>
```

```
            <label class="btn btn-wide btn-success" style="margin:15px
0;font-size:18px;">Current balance: KES 10.00</label>
                <!-- start: MENU TOGGLER FOR MOBILE DEVICES -->
        <div class="close-handle visible-xs-block menu-toggler" data-
toggle="collapse" href=".navbar-collapse">
            <div class="arrow-left"></div>
            <div class="arrow-right"></div>
        </div>
        <!-- end: MENU TOGGLER FOR MOBILE DEVICES -->
    </div>
    <!-- end: NAVBAR COLLAPSE -->
</header>


    <div id="app">

    <div class="sidebar app-aside" id="sidebar">
    <div class="sidebar-container perfect-scrollbar">
        <nav>
            <!-- start: MAIN NAVIGATION MENU -->


            <ul class="main-navigation-menu">

                <li>
                    <a href="/">
                        <div class="item-content">
                            <div class="item-media">
                                <i class="ti-home"></i>
                            </div>
                            <div class="item-inner">
                                <span class="title"> Dashboard </span>
                            </div>
                        </div>
                    </a>
                </li>

                <li class="active open" >
                    <a href="javascript:void(0)">
                        <div class="item-content">
                            <div class="item-media">
                                <i class="ti-mobile"></i>
                            </div>
                            <div class="item-inner">
                                <span class="title">SMS</span><i class="icon-
arrow"></i>
                            </div>
                        </div>
                    </a>
                    <ul class="sub-menu">
                        <li>

                            <a href="/">
                                <span class="title"> Bulk SMS</span>
                                <i class="icon-arrow"></i>
                            </a>
```

```html
<ul class="sub-menu">
    <li>
        <a href="/sms/outbox">
            Outbox
        </a>
    </li>
    <li>
        <a href="/analytics/bulksms">
            Analytics
        </a>
    </li>
</ul>

    </li>
<li
>
    <a href="javascript:;">
        <span>Premium SMS</span> <i class="icon-
arrow"></i>
    </a>
    <ul class="sub-menu">
                                    <li>
        <a href="/sms/premiumoutbox">
            Premium Outbox
        </a>
    </li>
    <li>
        <a href="/sms/subscription">
            Subscription products
        </a>
    </li>
    <li>
        <a href="/analytics/premiumsms">
            Analytics
        </a>
    </li>

    </ul>

 </li>
<li>
        <a href="/sms/inbox">
                Inbox
        </a>
 </li>
 <li >
    <a href="javascript:;">
        <span>Shortcodes</span> <i class="icon-
arrow"></i>
    </a>

    <ul class="sub-menu">
        <li>
            <a href="/sms/shortcodes">
                My Shortcodes
            </a>
        </li>
```

```html
                                        <li>
                                            <a href="/sms/shortcoderequest">
                                                Request
                                            </a>
                                        </li>
                                    </ul>
                                </li>
                                <li >
                                    <a href="javascript:;">
                                        <span>Alphanumerics</span> <i class="icon-
arrow"></i>
                                    </a>
                                    <ul class="sub-menu">
                                        <li>
                                            <a href="/sms/alphanumerics">
                                                My alphanumerics
                                            </a>
                                        </li>
                                        <li>
                                            <a href="/sms/alphanumericrequest">
                                                Request
                                            </a>
                                        </li>
                                    </ul>
                                </li>

                                <li >
                                    <a href="javascript:void(0);">
                                        <span>Keywords</span> <i class="icon-
arrow"></i>
                                    </a>

                                    <ul class="sub-menu">
                                        <li>
                                            <a href="/sms/keywords">My Keywords
                                            </a>
                                        </li>
                                        <li>
                                            <a href="/sms/keywordrequest">
                                                Request
                                            </a>
                                        </li>
                                    </ul>

                                </li>

                                <li>
                                    <a href="/sms/smpp">
                                        <span>SMPP Accounts</span>
                                    </a>
                                </li>
                                <li >
                                    <a href="javascript:;">
                                        <span>SMS callback URLs</span> <i
class="icon-arrow"></i>
                                    </a>
```

```html
<ul class="sub-menu">
    <li>
        <a href="/sms/inboxcallback">
            Incoming messages
        </a>
    </li>
    <li>
        <a href="/sms/dlrcallback">
            Delivery report
        </a>
    </li>
    <li>
        <a href="/sms/subscriptioncallback">
            Subscription notifications
        </a>
    </li>
    <li>
        <a href="/sms/blacklistcallback">
            Bulk SMS Opt out
        </a>
    </li>
</ul>
</li>

</ul>
</li>

<li>
    <a href="javascript:void(0)">
        <div class="item-content">
            <div class="item-media">
                <i class="ti-microphone"></i>
            </div>
            <div class="item-inner">
                <span class="title">Voice</span><i
class="icon-arrow"></i>
            </div>
        </div>
    </a>
    <ul class="sub-menu">
        <li>
            <a href="/voice/phones">
                <span class="title">My Phone Numbers</span>
            </a>
        </li>
        <li>
            <a href="/voice/request">
                <span class="title">Request a number</span>
            </a>
        </li>
        <li>
            <a href="/voice/sessions">
                <span class="title"> My Call logs</span>
            </a>
        </li>
        <li>
            <a href="/analytics/voice">
```

```html
                    <span class="title"> Analytics</span>
                </a>
            </li>


        </ul>
    </li>

    <li>
        <a href="javascript:void(0)">
            <div class="item-content">
                <div class="item-media">
                    <i class="ti-settings"></i>
                </div>
                <div class="item-inner">
                    <span class="title"> USSD</span><i
class="icon-arrow"></i>
                </div>
            </div>
        </a>
        <ul class="sub-menu">
            <li>
                <a href="/ussd/servicecodes">
                    <span class="title"> My service codes</span>
                </a>
            </li>
            <li>
                <a href="/ussd/ussdrequest">
                    <span class="title"> Request a code</span>
                </a>
            </li>
            <li>
                <a href="/ussd/sessions">
                    <span class="title"> My sessions</span>
                </a>
            </li>
            <li>
                <a href="/ussd/callback">
                    <span class="title"> Callbacks</span>
                </a>
            </li>
            <li>
                <a href="/analytics/ussd">
                    <span class="title"> Analytics</span>
                </a>
            </li>

        </ul>
    </li>

    <li>
        <a href="javascript:void(0)">
            <div class="item-content">
                <div class="item-media">
                    <i class="ti-receipt"></i>
                </div>
                <div class="item-inner">
```

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```
                                        <span class="title">  Airtime </span><i
class="icon-arrow"></i>
                        </div>
                    </div>
                </a>
                <ul class="sub-menu">

                    <li>
                        <a href="/airtime/transactions">
                            <span class="title"> My transactions</span>
                        </a>
                    </li>
                    <li>
                        <a href="/airtime/callback">
                            <span class="title"> Callback URL:
status</span>
                        </a>
                    </li>
                    <li>
                        <a href="/analytics/airtime">
                            <span class="title"> Analytics</span>
                        </a>
                    </li>
                </ul>
            </li>


            <li>
                <a href="javascript:void(0)">
                    <div class="item-content">
                        <div class="item-media">
                            <i class="ti-receipt"></i>
                        </div>
                        <div class="item-inner">
                            <span class="title"> Billing</span><i
class="icon-arrow"></i>
                        </div>
                    </div>
                </a>
                <ul class="sub-menu">
                    <li >
                        <a href="/billing/">
                            <span class="title"> Payment methods
</span><i class="icon-arrow"></i>
                        </a>
                                                <ul class="submenu">
                                                        <li>
                                                            <a
href="/billing/paymentmethods/kenya">
                                                                <span
class="title"> Kenya </span>
                                                            </a>
                                                    </li>
                                                    <li>
                                                            <a
href="/billing/paymentmethods/nigeria">
                                                            </a>
```

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```html
                                                        </li>
                                                        <li>
                                                            <a
href="/billing/paymentmethods/uganda">
                                                                <span
class="title"> Uganda </span>
                                                            </a>
                                                        </li>
                                                        <li>
                                                            <a
href="/billing/paypal">
                                                                <span
class="title"> Pay via paypal </span>
                                                            </a>
                                                        </li>
                                                    </ul>
                                </li>
                                <li>
                                    <a href="/billing/statement">
                                        <span class="title"> Account statement
</span>
                                    </a>
                                </li>
                                <li>
                                    <a href="/billing/notifications">
                                        <span class="title">Low balance alert</span>
                                    </a>
                                </li>

                            </ul>
                    </li>
                    <li>
                        <a href="javascript:void(0)">
                            <div class="item-content">
                                <div class="item-media">
                                    <i class="ti-plug"></i>
                                </div>
                                <div class="item-inner">
                                    <span class="title"> Settings</span><i
class="icon-arrow"></i>
                                </div>
                            </div>
                        </a>
                        <ul class="sub-menu">

                            <li>
                                <a href="/settings/changepassword">
                                    <span class="title"> Change Password </span>
                                </a>
                            </li>

                            <li>
                                <a href="/settings/apikey">
                                    <span class="title">API Key</span>
                                </a>
                            </li>
```

```html
                        </ul>
                    </li>
                    <li>
                        <a href="/profile">
                            <div class="item-content">
                                <div class="item-media">
                                    <i class="ti-image "></i>
                                </div>
                                <div class="item-inner">
                                    <span class="title"> Developer Profile
</span>
                                </div>
                            </div>
                        </a>
                    </li>
                    <li>
                        <a href="javascript:void(0)">
                            <div class="item-content">
                                <div class="item-media">
                                    <i class="ti-location-pin"></i>
                                </div>
                                <div class="item-inner">
                                    <span class="title"> Contact Us</span><i
class="icon-arrow"></i>
                                </div>
                            </div>
                        </a>
                        <ul class="sub-menu">
                            <li>
                                <a href="/contactus">
                                    <span class="title"> Talk to Sales</span>
                                </a>
                            </li>

                        </ul>
                    </li>


            </ul>
            <!-- end: MAIN NAVIGATION MENU -->

        </nav>
    </div>
</div>

<div class="main-content" >
    <div class="wrap-content container" id="container">
        <!-- start: PAGE TITLE -->
        <section id="page-title">
            <div class="row">
            <div class="subnav-wrapper" style="height: 55px;">
                    <div role="subnav" class="container sub-navigation dark">
                        <div class="row">
                            <div class="title"><a href="/help"><img
class="logo hidden" src="/logo.png">
            <h3>SMS</h3></a></div>
                    <div class="options">
```

```html
                            <ul>
                                <li class="selected"><a
href="/sms">SMS</a></li>

                                <li><a href="/ussd">USSD</a></li>
                                <li><a href="/voice">Voice</a></li>
                                <li><a href="/airtime">Airtime</a></li>
                            </ul>
                        </div>
                        </div>
                        </div>
                        </div>


            </div>
        </section>
        <!-- end: PAGE TITLE -->
        <!-- start: DYNAMIC TABLE -->
        <div class="container-fluid container-fullw bg-white">
            <div class="row">
                <div class="col-md-12">
                    <h2>My SMPP Account</h2>
                        <p>
                        SMPP is a mature and standardized protocol for
sending and receiving SMS messages that is well understood across
                        the world. To facilitate integration of our API with
existing SMPP connections, you can request for an SMPP
                        account (at no additional cost).
                        </p>

                        <p>
                        You will be able to quickly integrate with our API
and enjoy all the benefits that come with it
                        (dashboard, premium services etc).
                        </p>

                        <p>
                        To request for an account, please get in touch with
us either on chat, or by sending an email
                        to <strong>info_at_africastalking.com</strong>.
                        </p>

                </div>
            </div>

            <div class="row">

                <div class="col-md-12">
                                            No SMPP accounts were found for
your account.


                </div>

            </div>
        </div>
    </div>
</div>
```

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```html
<footer>
    <div class="footer-inner">
        <div class="pull-left">
            &copy; <span class="current-year"></span> <span class="text-bold text-uppercase">Africastalking</span>. <span>All rights reserved</span>
        </div>
        <div class="pull-right">
            <span class="go-top"><i class="ti-angle-up"></i></span>
        </div>
    </div>
</footer></div>
</body>
    <script type="text/javascript" src="/js/jquery/jquery.min.js"></script>
<script type="text/javascript" src="/js/account/jquery-ui.min.js"></script>
<script type="text/javascript" src="/js/main.js"></script>
<script type="text/javascript" src="/js/perfect-scrollbar/perfect-scrollbar.min.js"></script>
<script type="text/javascript" src="/js/account/datepicker/moment.min.js"></script>
<script type="text/javascript" src="/js/account/datepicker/datepicker.js"></script>
<script type="text/javascript" src="/js/bootstrap.min.js"></script>
<script>

(function(i,s,o,g,r,a,m){i['GoogleAnalyticsObject']=r;i[r]=i[r]||function(){
  (i[r].q=i[r].q||[]).push(arguments)},i[r].l=1*new Date();a=s.createElement(o),

m=s.getElementsByTagName(o)[0];a.async=1;a.src=g;m.parentNode.insertBefore(a,m)
  })(window,document,'script','https://www.google-analytics.com/analytics.js','ga');

  ga('create', 'UA-76516889-1', 'auto');
  ga('send', 'pageview');

</script>
<script>
  window.intercomSettings = {
    app_id: "zqbvfqge",
      name: "evanskimutai",
      email: "echesang@kabarak.ac.ke",
      created_at: "2016-08-09 10:32:11"
};
</script>
<script>(function(){var w=window;var ic=w.Intercom;if(typeof
ic==="function"){ic('reattach_activator');ic('update',intercomSettings);}else
{var d=document;var
i=function(){i.c(arguments)};i.q=[];i.c=function(args){i.q.push(args)};w.Intercom=i;function l(){var
s=d.createElement('script');s.type='text/javascript';s.async=true;s.src='https://widget.intercom.io/widget/zqbvfqge';var
x=d.getElementsByTagName('script')[0];x.parentNode.insertBefore(s,x);}if(w.at
```

```
tachEvent){w.attachEvent('onload',l);}else{w.addEventListener('load',l,false)
;}}})()</script>
</html>




<script type="text/javascript"
src="/omni/view/js/generalvalidations.js"></script>

<html>
<script>

      window.document.dir='LTR';

</script>
      <head>
            <base
href="http://omni3.1appaccess.tnbldom.tnbl.co.ke:9999/omni/view/layouts/siteL
ayout.jsp">
            <title>Login Page</title>
      </head>
      <body>

            <table border="0" width="100%" valign="top" >
                  <tbody>
                        <tr>
                              <td valign="top">




<html>




<script type="text/javascript" language="javascript1.2"
src="../js/generalvalidations.js"></script>
<script>
      function changeLanguage(langsel)
      {
            if (langsel=="es")
            {
                  document.getElementById("Loginbg").background =
"./../images/index_14_es.jpg";
                  document.getElementById("id_login").innerHTML =
"ID de ingreso";
                  document.getElementById("id_password").innerHTML = "Clave";
                  document.forms[0].Submit.value = "Ingreso";
                  document.forms[0].guestLogin.value = "Convidado Iniciar";
```

```
                        document.getElementById("index25").src =
"./../images/index_25_es.jpg";
                        document.getElementById("index26").src =
"./../images/index_26_es.jpg";
                        document.getElementById("index27").src =
"./../images/index_27_es.jpg";
                }
                else
                {
                        document.getElementById("Loginbg").background =
"./../images/index_14.jpg";
                        document.getElementById("id_login").innerHTML = "Login ID";
                        document.getElementById("id_password").innerHTML =
"Password";
                        document.forms[0].Submit.value = "Login";
                        document.forms[0].guestLogin.value = "Guest Login";
                        document.getElementById("index25").src =
"./../images/index_25.jpg";
                        document.getElementById("index26").src =
"./../images/index_26.jpg";
                        document.getElementById("index27").src =
"./../images/index_27.jpg";
                }
        }

        function breakout_of_frame()
        {
          try
          {
              if (!window.opener.closed)
              {

                      window.opener.top.location.href = document.location.href ;
                      window.opener.top.focus();
                      self.close();
              }
          }
          catch(exception)
          {
              if (top.location != location)
              {
              top.location.href = document.location.href ;
              top.focus();
              }
          }
        }

        function renderToForgotPassword()
        {
                var confirmVal;
                if(Trim(document.forms[0].userName.value)=="")
                {
                        alert("Please fill in your Login name.\nThen click on this
link to continue");
                        return false;
                }
```

```
//          confirmVal=confirm("Please confirm your login name.\nIf correct
please click Ok to continue, \nIf not then please click Cancel button to
continue.");
            alert("Please contact your system administrator to reset your
password");
            confirmVal = false;
            if(confirmVal)
            {
                    document.forms[0].action="/omni/forgotPasswordMail.do";
                    document.forms[0].submit();
                    return false;
            }
            else
            {
                    return false;
            }
        }

    function guestLoginClick()
    {
            if(Trim(document.forms[0].userName.value)=="" ||
Trim(document.forms[0].password.value)=="")
            {
                    alert('You must specify both User Name and Password.');
                    return false;
            }
            else
            {

    document.forms[0].action="/omni/loginAction.do?guest=true&gFirst=true";
                    document.forms[0].submit();
            }
        }
    function setToCaps(t){
            try{
                    t.value = (t.value).toUpperCase();
            }catch(err){
            }
        }
    var isVirtual = 'N';
    function virtcheck()
    {
            if(isVirtual=='N')
            {
                    virtualKey('');
                    document.getElementById('virtualenable').style.display='';
                    isVirtual='Y';
            }
            else if(isVirtual=='Y')
            {
                    var test1=confirm("Virtual keyboard is recommended to
protect your password. Are you sure you want to use normal keyboard?");
                    if(test1)
                    {
                            virtualKey('');

    document.getElementById('virtualenable').style.display='none';
```

```
                          isVirtual='N';
                          document.getElementById('password').value="";
                          document.getElementById('password').readOnly=false;
                  }
                  else
                  {

        document.getElementById('virtualpassword').checked=true;
                  }
            }
      }
      function dipVirtual()
      {
            if(isVirtual=='N')
            {
                  document.getElementById('dispVirtual').style.display='';
                  isVirtual='Y';
            }
            else if(isVirtual=='Y')
            {

        document.getElementById('dispVirtual').style.display='none';
                  isVirtual='N';
            }
      }
</script>

<head>
<TITLE>OmniEnterprise Back Office</TITLE>
<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1">
<link href="./../style/home-css.css" rel="stylesheet" type="text/css">
<link href="./../style/virtual-Key.css" rel="stylesheet" type="text/css">

<style type="text/css">
<!--
.style1 {font-weight: bold}
-->
</style>
</head>
<body bgcolor="#bbd8fb" leftmargin="0" topmargin="0" marginwidth="0"
marginheight="0"  onLoad="breakout_of_frame()" onbeforeprint="return false"
onprint="return false" onbeforecopy="return false" oncopy="return false"
onbeforecut="return false" oncut="return false" onbeforepaste="return false"
onpaste="return false" ondrag="return false;" ondrop="return false;">
<script type="text/javascript" language="Javascript1.1">

<!-- Begin

     var bCancel = false;

    function validateLoginForm(form) {
        if (bCancel)
      return true;
        else
 var formValidationResult;
       formValidationResult = validateRequired(form);
     return (formValidationResult == 1);
```

```
    }

    function loginForm_required () {
     this.a0 = new Array("userName", "You must specify both User Name and
Password.", new Function ("varName", " return this[varName];"));
    }




    /*$RCSfile: validateMinLength.js,v $ $Revision: 1.11 $ $Date: 2004/03/28
16:53:21 $ */
    /**
    * A field is considered valid if greater than the specified minimum.
    * Fields are not checked if they are disabled.
    * <p>
    * <strong>Caution:</strong> Using <code>validateMinLength</code> on a
password field in a
    *  login page gives unnecessary information away to hackers. While it
only slightly
    *  weakens security, we suggest using it only when modifying a
password.</p>
    * @param form The form validation is taking place on.
    */
    function validateMinLength(form) {
        var isValid = true;
        var focusField = null;
        var i = 0;
        var fields = new Array();
        var formName = form.getAttributeNode("name");


        oMinLength = eval('new ' + formName.value + '_minlength()');

        for (x in oMinLength) {
            var field = form[oMinLength[x][0]];

            if ((field.type == 'hidden' ||
                field.type == 'text' ||
                field.type == 'password' ||
                field.type == 'textarea') &&
                field.disabled == false) {

                var iMin = parseInt(oMinLength[x][2]("minlength"));
                if ((trim(field.value).length > 0) && (field.value.length <
iMin)) {
                    if (i == 0) {
                        focusField = field;
                    }
                    fields[i++] = oMinLength[x][1];
                    isValid = false;
                }
            }
        }
        if (fields.length > 0) {
            focusField.focus();
            alert(fields.join('\n'));
```

```
        }
        return isValid;
    }

    /*$RCSfile: validateUtilities.js,v $ $Revision: 1.2 $ $Date: 2004/03/28
16:53:21 $ */

  /**
  * This is a place holder for common utilities used across the javascript
validation
  *
  **/


   /*$RCSfile: validateFloatRange.js,v $ $Revision: 1.9 $ $Date: 2004/03/28
16:53:21 $ */
    /**
    * Check to see if fields are in a valid float range.
    * Fields are not checked if they are disabled.
    * <p>
    * @param form The form validation is taking place on.
    */
    function validateFloatRange(form) {
        var isValid = true;
        var focusField = null;
        var i = 0;
        var fields = new Array();
        var formName = form.getAttributeNode("name");

        oRange = eval('new ' + formName.value + '_floatRange()');
        for (x in oRange) {
            var field = form[oRange[x][0]];

            if ((field.type == 'hidden' ||
                field.type == 'text' || field.type == 'textarea') &&
                (field.value.length > 0)  &&
                 field.disabled == false) {

                var fMin = parseFloat(oRange[x][2]("min"));
                var fMax = parseFloat(oRange[x][2]("max"));
                var fValue = parseFloat(field.value);
                if (!(fValue >= fMin && fValue <= fMax)) {
                    if (i == 0) {
                        focusField = field;
                    }
                    fields[i++] = oRange[x][1];
                    isValid = false;
                }
            }
        }
        if (fields.length > 0) {
            focusField.focus();
            alert(fields.join('\n'));
        }
        return isValid;
    }
```

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```
    /*$RCSfile: validateIntRange.js,v $ $Revision: 1.10 $ $Date: 2004/03/28
16:53:21 $ */
    /**
    * Check to see if fields is in a valid integer range.
    * Fields are not checked if they are disabled.
    * <p>
    * @param form The form validation is taking place on.
    */
    function validateIntRange(form) {
        var isValid = true;
        var focusField = null;
        var i = 0;
        var fields = new Array();
        var formName = form.getAttributeNode("name");

        oRange = eval('new ' + formName.value + '_intRange()');
        for (x in oRange) {
            var field = form[oRange[x][0]];
            if (field.disabled == false)  {
                var value = '';
                if (field.type == 'hidden' ||
                    field.type == 'text' || field.type == 'textarea' ||
                    field.type == 'radio' ) {
                    value = field.value;
                }
                if (field.type == 'select-one') {
                    var si = field.selectedIndex;
                    if (si >= 0) {
                        value = field.options[si].value;
                    }
                }
                if (value.length > 0) {
                    var iMin = parseInt(oRange[x][2]("min"));
                    var iMax = parseInt(oRange[x][2]("max"));
                    var iValue = parseInt(value);
                    if (!(iValue >= iMin && iValue <= iMax)) {
                        if (i == 0) {
                            focusField = field;
                        }
                        fields[i++] = oRange[x][1];
                        isValid = false;
                    }
                }
            }
        }
        if (fields.length > 0) {
            focusField.focus();
            alert(fields.join('\n'));
        }
        return isValid;
    }


    /*$RCSfile: validateInteger.js,v $ $Revision: 1.9 $ $Date: 2004/03/28
16:53:21 $ */
    /**
```

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```
 * Check to see if fields are a valid integer.
 * Fields are not checked if they are disabled.
 * <p>
 * @param form The form validation is taking place on.
 */
function validateInteger(form) {
    var bValid = true;
    var focusField = null;
    var i = 0;
    var fields = new Array();
    var formName = form.getAttributeNode("name");

    oInteger = eval('new ' + formName.value + '_IntegerValidations()');
    for (x in oInteger) {
        var field = form[oInteger[x][0]];

        if ((field.type == 'hidden' ||
            field.type == 'text' ||
            field.type == 'textarea' ||
            field.type == 'select-one' ||
            field.type == 'radio') &&
            field.disabled == false) {

            var value = '';
            // get field's value
            if (field.type == "select-one") {
                var si = field.selectedIndex;
                if (si >= 0) {
                    value = field.options[si].value;
                }
            } else {
                value = field.value;
            }

            if (value.length > 0) {

                if (!isAllDigits(value)) {
                    bValid = false;
                    if (i == 0) {
                        focusField = field;
                    }
                    fields[i++] = oInteger[x][1];

                } else {
                    var iValue = parseInt(value);
                    if (isNaN(iValue) || !(iValue >= -2147483648 &&
iValue <= 2147483647)) {
                        if (i == 0) {
                            focusField = field;
                        }
                        fields[i++] = oInteger[x][1];
                        bValid = false;
                    }
                }
            }
        }
```

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```
        if (fields.length > 0) {
           focusField.focus();
           alert(fields.join('\n'));
        }
        return bValid;
    }

    function isAllDigits(argvalue) {
        argvalue = argvalue.toString();
        var validChars = "0123456789";
        var startFrom = 0;
        if (argvalue.substring(0, 2) == "0x") {
           validChars = "0123456789abcdefABCDEF";
           startFrom = 2;
        } else if (argvalue.charAt(0) == "0") {
           validChars = "01234567";
           startFrom = 1;
        } else if (argvalue.charAt(0) == "-") {
            startFrom = 1;
        }

        for (var n = startFrom; n < argvalue.length; n++) {
            if (validChars.indexOf(argvalue.substring(n, n+1)) == -1) return
false;
        }
        return true;
    }


    /*$RCSfile: validateMask.js,v $ $Revision: 1.10 $ $Date: 2004/03/28
16:53:21 $ */
    /**
    * Check to see if fields are a valid using a regular expression.
    * Fields are not checked if they are disabled.
    * <p>
    * @param form The form validation is taking place on.
    */
    function validateMask(form) {
        var isValid = true;
        var focusField = null;
        var i = 0;
        var fields = new Array();
        var formName = form.getAttributeNode("name");

        oMasked = eval('new ' + formName.value + '_mask()');
        for (x in oMasked) {
            var field = form[oMasked[x][0]];

            if ((field.type == 'hidden' ||
                field.type == 'text' ||
                 field.type == 'textarea' ||
                        field.type == 'file') &&
                 (field.value.length > 0) &&
                 field.disabled == false) {

                if (!matchPattern(field.value, oMasked[x][2]("mask"))) {
                    if (i == 0) {
```

```
                focusField = field;
            }
            fields[i++] = oMasked[x][1];
            isValid = false;
        }
    }
}

if (fields.length > 0) {
    focusField.focus();
    alert(fields.join('\n'));
}
return isValid;
}

function matchPattern(value, mask) {
    return mask.exec(value);
}


/*$RCSfile: validateDate.js,v $ $Revision: 1.10 $ $Date: 2004/03/28
16:53:21 $ */
/**
 * Check to see if fields are a valid date.
 * Fields are not checked if they are disabled.
 * <p>
 * @param form The form validation is taking place on.
 */
function validateDate(form) {
    var bValid = true;
    var focusField = null;
    var i = 0;
    var fields = new Array();
    var formName = form.getAttributeNode("name");

    oDate = eval('new ' + formName.value + '_DateValidations()');

    for (x in oDate) {
        var field = form[oDate[x][0]];
        var value = field.value;
        var datePattern = oDate[x][2]("datePatternStrict");
        // try loose pattern
        if (datePattern == null)
            datePattern = oDate[x][2]("datePattern");
        if ((field.type == 'hidden' ||
             field.type == 'text' ||
             field.type == 'textarea') &&
            (value.length > 0) && (datePattern.length > 0) &&
            field.disabled == false) {
          var MONTH = "MM";
          var DAY = "dd";
          var YEAR = "yyyy";
          var orderMonth = datePattern.indexOf(MONTH);
          var orderDay = datePattern.indexOf(DAY);
          var orderYear = datePattern.indexOf(YEAR);
          if ((orderDay < orderYear && orderDay > orderMonth)) {
              var iDelim1 = orderMonth + MONTH.length;
```

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```
                        var iDelim2 = orderDay + DAY.length;
                        var delim1 = datePattern.substring(iDelim1, iDelim1 +
1);
                        var delim2 = datePattern.substring(iDelim2, iDelim2 +
1);
                        if (iDelim1 == orderDay && iDelim2 == orderYear) {
                            dateRegexp = new
RegExp("^(\\d{2})(\\d{2})(\\d{4})$");
                        } else if (iDelim1 == orderDay) {
                            dateRegexp = new RegExp("^(\\d{2})(\\d{2})[" + delim2
+ "](\\d{4})$");
                        } else if (iDelim2 == orderYear) {
                            dateRegexp = new RegExp("^(\\d{2})[" + delim1 +
"](\\d{2})(\\d{4})$");
                        } else {
                            dateRegexp = new RegExp("^(\\d{2})[" + delim1 +
"](\\d{2})[" + delim2 + "](\\d{4})$");
                        }
                        var matched = dateRegexp.exec(value);
                        if(matched != null) {
                            if (!isValidDate(matched[2], matched[1], matched[3]))
{
                                if (i == 0) {
                                    focusField = field;
                                }
                                fields[i++] = oDate[x][1];
                                bValid =  false;
                            }
                        } else {
                            if (i == 0) {
                                focusField = field;
                            }
                            fields[i++] = oDate[x][1];
                            bValid =  false;
                        }
                    } else if ((orderMonth < orderYear && orderMonth >
orderDay)) {
                        var iDelim1 = orderDay + DAY.length;
                        var iDelim2 = orderMonth + MONTH.length;
                        var delim1 = datePattern.substring(iDelim1, iDelim1 +
1);
                        var delim2 = datePattern.substring(iDelim2, iDelim2 +
1);
                        if (iDelim1 == orderMonth && iDelim2 == orderYear) {
                            dateRegexp = new
RegExp("^(\\d{2})(\\d{2})(\\d{4})$");
                        } else if (iDelim1 == orderMonth) {
                            dateRegexp = new RegExp("^(\\d{2})(\\d{2})[" +
delim2 + "](\\d{4})$");
                        } else if (iDelim2 == orderYear) {
                            dateRegexp = new RegExp("^(\\d{2})[" + delim1 +
"](\\d{2})(\\d{4})$");
                        } else {
                            dateRegexp = new RegExp("^(\\d{2})[" + delim1 +
"](\\d{2})[" + delim2 + "](\\d{4})$");
                        }
                        var matched = dateRegexp.exec(value);
```

```
                            if(matched != null) {
                                if (!isValidDate(matched[1], matched[2],
matched[3])) {
                                    if (i == 0) {
                                focusField = field;
                                    }
                                    fields[i++] = oDate[x][1];
                                    bValid =  false;
                                 }
                        } else {
                            if (i == 0) {
                                focusField = field;
                            }
                            fields[i++] = oDate[x][1];
                            bValid =  false;
                        }
                    } else if ((orderMonth > orderYear && orderMonth <
orderDay)) {
                        var iDelim1 = orderYear + YEAR.length;
                        var iDelim2 = orderMonth + MONTH.length;
                        var delim1 = datePattern.substring(iDelim1, iDelim1 +
1);
                        var delim2 = datePattern.substring(iDelim2, iDelim2 +
1);
                        if (iDelim1 == orderMonth && iDelim2 == orderDay) {
                            dateRegexp = new
RegExp("^(\\d{4})(\\d{2})(\\d{2})$");
                        } else if (iDelim1 == orderMonth) {
                            dateRegexp = new RegExp("^(\\d{4})(\\d{2})[" +
delim2 + "](\\d{2})$");
                        } else if (iDelim2 == orderDay) {
                            dateRegexp = new RegExp("^(\\d{4})[" + delim1 +
"](\\d{2})(\\d{2})$");
                        } else {
                            dateRegexp = new RegExp("^(\\d{4})[" + delim1 +
"](\\d{2})[" + delim2 + "](\\d{2})$");
                        }
                        var matched = dateRegexp.exec(value);
                        if(matched != null) {
                            if (!isValidDate(matched[3], matched[2],
matched[1])) {
                                    if (i == 0) {
                                        focusField = field;
                                    }
                                    fields[i++] = oDate[x][1];
                                    bValid =  false;
                                }
                        } else {
                            if (i == 0) {
                                focusField = field;
                            }
                            fields[i++] = oDate[x][1];
                            bValid =  false;
                        }
                    } else {
                        if (i == 0) {
                            focusField = field;
```

```
                }
                fields[i++] = oDate[x][1];
                bValid =  false;
            }
        }
    }
    if (fields.length > 0) {
        focusField.focus();
        alert(fields.join('\n'));
    }
    return bValid;
}


function isValidDate(day, month, year) {
    if (month < 1 || month > 12) {
        return false;
    }
    if (day < 1 || day > 31) {
        return false;
    }
    if ((month == 4 || month == 6 || month == 9 || month == 11) &&
        (day == 31)) {
        return false;
    }
    if (month == 2) {
        var leap = (year % 4 == 0 &&
            (year % 100 != 0 || year % 400 == 0));
        if (day>29 || (day == 29 && !leap)) {
            return false;
        }
    }
    return true;
}


/*$RCSfile: validateFloat.js,v $ $Revision: 1.11 $ $Date: 2004/03/28
16:53:21 $ */
/**
 * Check to see if fields are a valid float.
 * Fields are not checked if they are disabled.
 * <p>
 * @param form The form validation is taking place on.
 */
function validateFloat(form) {
    var bValid = true;
    var focusField = null;
    var i = 0;
    var fields = new Array();
     var formName = form.getAttributeNode("name");

    oFloat = eval('new ' + formName.value + '_FloatValidations()');
    for (x in oFloat) {
        var field = form[oFloat[x][0]];

        if ((field.type == 'hidden' ||
            field.type == 'text' ||
            field.type == 'textarea' ||
```

```
                    field.type == 'select-one' ||
                    field.type == 'radio') &&
                    field.disabled == false) {

                      var value = '';
                  // get field's value
                  if (field.type == "select-one") {
                      var si = field.selectedIndex;
                      if (si >= 0) {
                          value = field.options[si].value;
                      }
                  } else {
                      value = field.value;
                  }

                  if (value.length > 0) {
                      // remove '.' before checking digits
                      var tempArray = value.split('.');
                      //Strip off leading '0'
                      var zeroIndex = 0;
                      var joinedString= tempArray.join('');
                      while (joinedString.charAt(zeroIndex) == '0') {
                          zeroIndex++;
                      }
                      var noZeroString =
joinedString.substring(zeroIndex,joinedString.length);

                      if (!isAllDigits(noZeroString)) {
                          bValid = false;
                          if (i == 0) {
                              focusField = field;
                          }
                          fields[i++] = oFloat[x][1];

                      } else {
                        var iValue = parseFloat(value);
                        if (isNaN(iValue)) {
                            if (i == 0) {
                                focusField = field;
                            }
                            fields[i++] = oFloat[x][1];
                            bValid = false;
                        }
                      }
                  }
               }
           }
       }
       if (fields.length > 0) {
           focusField.focus();
           alert(fields.join('\n'));
       }
       return bValid;
    }


    /*$RCSfile: validateCreditCard.js,v $ $Revision: 1.8 $ $Date: 2004/03/28
16:53:21 $ */
```

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```
    /**
     * Check to see if fields are a valid creditcard number based on Luhn
checksum.
     * Fields are not checked if they are disabled.
     * <p>
     * @param form The form validation is taking place on.
     */
    function validateCreditCard(form) {
        var bValid = true;
        var focusField = null;
        var i = 0;
        var fields = new Array();
        var formName = form.getAttributeNode("name");

        oCreditCard = eval('new ' + formName.value + '_creditCard()');

        for (x in oCreditCard) {
            if ((form[oCreditCard[x][0]].type == 'text' ||
                 form[oCreditCard[x][0]].type == 'textarea') &&
                (form[oCreditCard[x][0]].value.length > 0)  &&
                 form[oCreditCard[x][0]].disabled == false) {
                if (!luhnCheck(form[oCreditCard[x][0]].value)) {
                    if (i == 0) {
                        focusField = form[oCreditCard[x][0]];
                    }
                    fields[i++] = oCreditCard[x][1];
                    bValid = false;
                }
            }
        }
        if (fields.length > 0) {
            focusField.focus();
            alert(fields.join('\n'));
        }
        return bValid;
    }

    /**
     * Checks whether a given credit card number has a valid Luhn checksum.
     * This allows you to spot most randomly made-up or garbled credit card
numbers immediately.
     * Reference: http://www.speech.cs.cmu.edu/~sburke/pub/luhn_lib.html
     */
    function luhnCheck(cardNumber) {
        if (isLuhnNum(cardNumber)) {
            var no_digit = cardNumber.length;
            var oddoeven = no_digit & 1;
            var sum = 0;
            for (var count = 0; count < no_digit; count++) {
                var digit = parseInt(cardNumber.charAt(count));
                if (!((count & 1) ^ oddoeven)) {
                    digit *= 2;
                    if (digit > 9) digit -= 9;
                };
                sum += digit;
            };
            if (sum == 0) return false;
```

```
            if (sum % 10 == 0) return true;
        };
        return false;
    }

    function isLuhnNum(argvalue) {
        argvalue = argvalue.toString();
        if (argvalue.length == 0) {
            return false;
        }
        for (var n = 0; n < argvalue.length; n++) {
            if ((argvalue.substring(n, n+1) < "0") ||
                (argvalue.substring(n,n+1) > "9")) {
                return false;
            }
        }
        return true;
    }


    /*$RCSfile: validateShort.js,v $ $Revision: 1.9 $ $Date: 2004/03/28
16:53:21 $ */
    /**
    *  Check to see if fields are a valid short.
    * Fields are not checked if they are disabled.
    * <p>
    * @param form The form validation is taking place on.
    */
    function validateShort(form) {
        var bValid = true;
        var focusField = null;
        var i = 0;
        var fields = new Array();
        var formName = form.getAttributeNode("name");

        oShort = eval('new ' + formName.value + '_ShortValidations()');

        for (x in oShort) {
            var field = form[oShort[x][0]];

            if ((field.type == 'hidden' ||
                field.type == 'text' ||
                field.type == 'textarea' ||
                field.type == 'select-one' ||
                field.type == 'radio')  &&
                field.disabled == false) {

                var value = '';
                // get field's value
                if (field.type == "select-one") {
                    var si = field.selectedIndex;
                    if (si >= 0) {
                        value = field.options[si].value;
                    }
                } else {
                    value = field.value;
                }
```

```
                if (value.length > 0) {
                    if (!isAllDigits(value)) {
                        bValid = false;
                        if (i == 0) {
                            focusField = field;
                        }
                        fields[i++] = oShort[x][1];

                    } else {

                        var iValue = parseInt(value);
                        if (isNaN(iValue) || !(iValue >= -32768 && iValue <=
32767)) {

                            if (i == 0) {
                                focusField = field;
                            }
                            fields[i++] = oShort[x][1];
                            bValid = false;
                        }
                    }
                }
            }
        }
        if (fields.length > 0) {
            focusField.focus();
            alert(fields.join('\n'));
        }
        return bValid;
    }


    /*$RCSfile: validateMaxLength.js,v $ $Revision: 1.10 $ $Date: 2004/03/28
16:53:21 $ */
    /**
    * A field is considered valid if less than the specified maximum.
    * Fields are not checked if they are disabled.
    * <p>
    * <strong>Caution:</strong> Using <code>validateMaxLength</code> on a
password field in a
    *  login page gives unnecessary information away to hackers. While it
only slightly
    *  weakens security, we suggest using it only when modifying a
password.</p>
    * @param form The form validation is taking place on.
    */
    function validateMaxLength(form) {
        var isValid = true;
        var focusField = null;
        var i = 0;
        var fields = new Array();
        var formName = form.getAttributeNode("name");

        oMaxLength = eval('new ' + formName.value + '_maxlength()');
        for (x in oMaxLength) {
            var field = form[oMaxLength[x][0]];
```

```
        if ((field.type == 'hidden' ||
             field.type == 'text' ||
             field.type == 'password' ||
             field.type == 'textarea') &&
             field.disabled == false) {

            var iMax = parseInt(oMaxLength[x][2]("maxlength"));
            if (field.value.length > iMax) {
                if (i == 0) {
                    focusField = field;
                }
                fields[i++] = oMaxLength[x][1];
                isValid = false;
            }
        }
    }
    if (fields.length > 0) {
        focusField.focus();
        alert(fields.join('\n'));
    }
    return isValid;
}


/*$RCSfile: validateEmail.js,v $ $Revision: 1.9 $ $Date: 2004/03/28
16:53:21 $ */
/**
 * Check to see if fields are a valid email address.
 * Fields are not checked if they are disabled.
 * <p>
 * @param form The form validation is taking place on.
 */
function validateEmail(form) {
    var bValid = true;
    var focusField = null;
    var i = 0;
    var fields = new Array();
    var formName = form.getAttributeNode("name");


    oEmail = eval('new ' + formName.value + '_email()');

    for (x in oEmail) {
        var field = form[oEmail[x][0]];
        if ((field.type == 'hidden' ||
             field.type == 'text' ||
             field.type == 'textarea') &&
            (field.value.length > 0) &&
            field.disabled == false) {
            if (!checkEmail(field.value)) {
                if (i == 0) {
                    focusField = field;
                }
                fields[i++] = oEmail[x][1];
                bValid = false;
            }
        }
```

```
    }
    if (fields.length > 0) {
        focusField.focus();
        alert(fields.join('\n'));
    }
    return bValid;
}

/**
 * Reference: Sandeep V. Tamhankar (stamhankar@hotmail.com),
 * http://javascript.internet.com
 */
function checkEmail(emailStr) {
    if (emailStr.length == 0) {
        return true;
    }
    var emailPat=/^(.+)@(.+)$/;
    var specialChars="\\(\\)<>@,;:\\\\\\\"\\.\\[\\]";
    var validChars="\[^\\s" + specialChars + "\]";
    var quotedUser="(\"[^\"]*\")";
    var ipDomainPat=/^(\d{1,3})[.](\d{1,3})[.](\d{1,3})[.](\d{1,3})$/;
    var atom=validChars + '+';
    var word="(" + atom + "|" + quotedUser + ")";
    var userPat=new RegExp("^" + word + "(\\." + word + ")*$");
    var domainPat=new RegExp("^" + atom + "(\\." + atom + ")*$");
    var matchArray=emailStr.match(emailPat);
    if (matchArray == null) {
        return false;
    }
    var user=matchArray[1];
    var domain=matchArray[2];
    if (user.match(userPat) == null) {
        return false;
    }
    var IPArray = domain.match(ipDomainPat);
    if (IPArray != null) {
        for (var i = 1; i <= 4; i++) {
            if (IPArray[i] > 255) {
                return false;
            }
        }
        return true;
    }
    var domainArray=domain.match(domainPat);
    if (domainArray == null) {
        return false;
    }
    var atomPat=new RegExp(atom,"g");
    var domArr=domain.match(atomPat);
    var len=domArr.length;
    if ((domArr[domArr.length-1].length < 2) ||
        (domArr[domArr.length-1].length > 3)) {
        return false;
    }
    if (len < 2) {
        return false;
    }
```

```
        return true;
    }




    /*$RCSfile: validateByte.js,v $ $Revision: 1.9 $ $Date: 2004/03/28
16:53:21 $ */
    /**
    * Check to see if fields are a valid byte.
    * Fields are not checked if they are disabled.
    * <p>
    * @param form The form validation is taking place on.
    */
    function validateByte(form) {
        var bValid = true;
        var focusField = null;
        var i = 0;
        var fields = new Array();
        var formName = form.getAttributeNode("name");
        oByte = eval('new ' + formName.value + '_ByteValidations()');

        for (x in oByte) {
            var field = form[oByte[x][0]];

            if ((field.type == 'hidden' ||
                field.type == 'text' ||
                field.type == 'textarea' ||
                field.type == 'select-one' ||
                field.type == 'radio')  &&
                field.disabled == false) {

                var value = '';
                // get field's value
                if (field.type == "select-one") {
                    var si = field.selectedIndex;
                    if (si >= 0) {
                        value = field.options[si].value;
                    }
                } else {
                    value = field.value;
                }

                if (value.length > 0) {
                    if (!isAllDigits(value)) {
                        bValid = false;
                        if (i == 0) {
                            focusField = field;
                        }
                        fields[i++] = oByte[x][1];

                    } else {

                        var iValue = parseInt(value);
                        if (isNaN(iValue) || !(iValue >= -128 && iValue <=
127)) {

                            if (i == 0) {
```

```
                                   focusField = field;
                               }
                               fields[i++] = oByte[x][1];
                               bValid = false;
                       }
                   }
               }

           }
       }
       if (fields.length > 0) {
           focusField.focus();
           alert(fields.join('\n'));
       }
       return bValid;
   }


   /*$RCSfile: validateRequired.js,v $ $Revision: 1.13 $ $Date: 2004/03/28
16:53:21 $ */
   /**
   *  Check to see if fields must contain a value.
   * Fields are not checked if they are disabled.
   * <p>
   * @param form The form validation is taking place on.
   */

   function validateRequired(form) {
       var isValid = true;
       var focusField = null;
       var i = 0;
       var fields = new Array();
       var formName = form.getAttributeNode("name");

       oRequired = eval('new ' + formName.value + '_required()');

       for (x in oRequired) {
           var field = form[oRequired[x][0]];

           if ((field.type == 'hidden' ||
               field.type == 'text' ||
               field.type == 'textarea' ||
               field.type == 'file' ||
               field.type == 'checkbox' ||
               field.type == 'select-one' ||
               field.type == 'password') &&
               field.disabled == false) {

               var value = '';
               // get field's value
               if (field.type == "select-one") {
                   var si = field.selectedIndex;
                   if (si >= 0) {
                       value = field.options[si].value;
                   }
               } else if (field.type == 'checkbox') {
                   if (field.checked) {
```

```
                    value = field.value;
                }
            } else {
                value = field.value;
            }

            if (trim(value).length == 0) {

                if (i == 0) {
                    focusField = field;
                }
                fields[i++] = oRequired[x][1];
                isValid = false;
            }
        } else if (field.type == "select-multiple") {
            var numOptions = field.options.length;
            lastSelected=-1;
            for(loop=numOptions-1;loop>=0;loop--) {
                if(field.options[loop].selected) {
                    lastSelected = loop;
                    value = field.options[loop].value;
                    break;
                }
            }
            if(lastSelected < 0 || trim(value).length == 0) {
                if(i == 0) {
                    focusField = field;
                }
                fields[i++] = oRequired[x][1];
                isValid=false;
            }
        } else if ((field.length > 0) && (field[0].type == 'radio' ||
field[0].type == 'checkbox')) {
            isChecked=-1;
            for (loop=0;loop < field.length;loop++) {
                if (field[loop].checked) {
                    isChecked=loop;
                    break; // only one needs to be checked
                }
            }
            if (isChecked < 0) {
                if (i == 0) {
                    focusField = field[0];
                }
                fields[i++] = oRequired[x][1];
                isValid=false;
            }
        }
    }
    if (fields.length > 0) {
        focusField.focus();
        alert(fields.join('\n'));
    }
    return isValid;
}

// Trim whitespace from left and right sides of s.
```

```
    function trim(s) {
        return s.replace( /^\s*/, "" ).replace( /\s*$/, "" );
    }


//End -->
</script>


<form name="loginForm" method="post"
action="/omni/loginAction.do;jsessionid=E42307363DA8DD7A064A40B91FE1B67B"
onsubmit="return validateLoginForm(this);" id="loginForm">
<script type="text/javascript" language="javascript1.2">
    function openNewWindow()
    {
      popupWin = window.open('/omni/forgot.do', 'open_window',
       'menubar=no, toolbar=no, location=no, directories=no, status=no,
scrollbars=no, resizable=no, dependent, width=400, height=460, left=0,
top=0')
    }
</script>

    <table id="Table_01" width="1002" height="618" border="0"
cellpadding="0" cellspacing="0">
    <tr>
        <td><img src="./../images/index_01.jpg" width="273" height="127"
alt=""></td>
        <td><img src="./../images/index_02.jpg" width="235" height="127"
alt=""></td>
        <td><img src="./../images/index_03.jpg" width="247" height="127"
alt=""></td>
        <td><img src="./../images/index_04.jpg" width="247" height="127"
alt=""></td>
    </tr>
    <tr>
        <td><img src="./../images/index_05.jpg" width="273" height="195"
alt=""></td>
        <td><img src="./../images/index_06.jpg" width="235" height="195"
alt=""></td>
      <td colspan="2" rowspan="2" valign="middle" style="width:494px;
height:390px; vertical-align:middle" bgcolor="#bbd8fb">
      <table width="100%" border="0" cellspacing="0" cellpadding="10" >
      <tr>
        <td style="background-image:url('../images/bg.jpg'); background-
position:bottom;">
            <table width="100%" border="0" cellspacing="0" cellpadding="0">
          <tr>
            <td width="22%" align="center" class="footer"><img
src="./../images/biometrics.jpg" width="76" height="104"><br>
              Biometric <br>
              Login</td>
            <td width="83%"><table width="100%" border="0" align="center"
cellpadding="2" cellspacing="2" >
              <tr>
                <td colspan="3" class="new-login-head">USER LOGIN </td>
              </tr>
              <tr>
```

```
                          <td height="25" colspan="3" class="loginerror"></td>
                        </tr>
                        <tr>
                          <td width="29%" class="new-login-txt"
id="id_login"><b>Login ID</b></td>
                          <td colspan="2"><label>
                            <input type="password" name="userName" maxlength="16"
value="" onchange="setToCaps(this);" class="new-login-input">
                          </label></td>
                        </tr>
                        <tr>
                          <td class="new-login-txt"
id="id_password"><b>Password</b></td>
                          <td width="37%">
                          <input type="password" name="password" maxlength="16"
size="15" value="" class="new-login-input">
                          </td>
                          <td width="34%" align="left">
                                    <div align="center">
                                        <input name="Submit" type="submit"
Class="new-login-button" value="Login" >
                                         
                                    </div>
                          </td>
                        </tr>
                        <tr>
                          <td colspan="3"><label> </label></td>
                        </tr>

                        <tr>
                          <td align="right"><input type="checkbox"
id="virtualpassword" name="virtualpassword" value="checkbox"
onClick="virtcheck()"></td>
                          <td colspan="2" style="font-family: Arial; font-size:
8pt">Use virtual keyboard<span style="color:#a41c2b; font-
weight:bold">(Recommended)</span></td>
                        </tr>
                      </table>
                          </td>
                  </tr>
                  <tr>
                    <td> </td>
                    <td>
                    <div id="virtualenable" style="display:none;" >
                    <table width="100%" border="0" cellspacing="0" cellpadding="0"
background="./../images/login_bg.gif">

                        <tr>
                          <td rowspan="2" align="left" valign="middle"> </td>
                          <td align="center" style="font-family: Arial; font-size:
8pt">Virtual Keyboard (for entering password only)</td>
                        </tr>
                        <tr>
                          <td align="left" valign="baseline">
<script>
var tab_y_n = 'false';
```

```
 var fset = new Array(1);

 var flen = new Array(1);

 fset[0] = new Array('password');

</script>

      <script>
            try{
                  if((Trim('YES') == 'no') || (Trim('YES') == 'false')){
                        document.getElementById('localeCode_es').checked =
true;
                  }else{
                        document.getElementById('localeCode_en').checked =
true;
                  }
            }catch(err){
            }
            </script>

                        <script>
                        try{

      document.getElementById('guestLoginButton').style.display = 'none';
                        }catch(err){

                        }
                        </script>

</html> </td>
                        </tr>
                        <tr>
                             <td>  </td>
                        </tr>
                  </tbody>
            </table>
      </body>
</html>
```