COLLEGE OF BUSINESS AND ECONOMICS

ASSESSMENT OF OPPORTUNITIES AND CHALLENGES OF THE ADOPTION OF NATIONAL SWITCH SYSTEM: THE CASE FOR SELECTED ETHIOPIAN COMMERCIAL BANKS AND ETHSWITCH

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Approval Sheet

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MBA PROGRAM

Assessment of Opportunities and challenges of the adoption of National Switch System: The case for selected Ethiopian Commercial Banks and Ethswitch

By

YONAS HAGOS

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Declaration

I, the undersigned, declare that this thesis is my original work, prepared under the guidance of Yohannes Workaferahu (PhD). All sources of materials used for the thesis have been duly acknowledged. I further confirm that the thesis has not been submitted either in part or in full to any other higher learning institution for the purpose of earning any degree.

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Addis Ababa University, Addis Ababa **June, 2019**

Endorsement

This thesis has been submitted to Addis Ababa University, College of Business and Economics for examination with my approval as a university advisor.

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Contents

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Abstract

In recent years, the very nature of banking is changing. What used to happen only in branches can now happen anywhere in the world at any time and through any delivery channel a customer might choose. It is now growing more and more in Ethiopia to deliver ebanking services through the adoption of integrated national switch system. The main objective of this study is to assess the major opportunities and challenges that comes with the adoption of National Switch System in the case of Ethiopian commercial banks and Ethswitch. The research is designed as an assessment on the payment system through eight selected commercial banks and Ethswitch as case study so that the findings can give insights to all stakeholders operating in the country. Both primary and secondary data were used as a source of information. Questionnaires are used as main instrument to collect primary data, while secondary data were reviewed from various publications. Descriptive with survey method is applied as a research setting and design/methodology. The target population for the study is about 129 and sample size of 98 was drawn using Taro Yemane's formula with sampling error of 0.5 and confidence interval of 95%. Data was analyzed using SPSS and results are presented using statistical mean and standard deviation values. The result from the analysis shows that: National Switch System modernizes payment instruments, significantly reduces commercial banks cost to introduce new services to their customers, saves customers resources in terms of time and money in addition to having new services and functionalities, contributes to the NBE's financial inclusion strategy and can be considered as a tool to create cashless society, and it is also one way of income generation for commercial banks. To the contrary, National Switch System is subjected to challenges like: Network and power fluctuation, poor settlement and chargeback process in case of a disputed transaction, poor cooperation among commercial banks to respond to customers' requests, lack of proper call center to handle customer complaints in time, lack of trust and fear from customers, limited awareness by customers, perceived complexity and cost, and poor project management and enforcement.

Keywords: Ethswitch, National Switch System, Payment System, Call Center

List of Figures

List of Acronyms

A2A	Account to Account transfer
C2A	Card to Account transfer
C2C	Card to Card transfer
ACI	Africa Capital Investment
ADC	Alternative delivery Channel
AFC	Agricultural Financial Corporation
ATM	Automated Teller Machine
BIS	Bank of Indian State
BOJ	Bank of Japan
CBE	Commercial Bank of Ethiopia
CPSS	Committee for Payment and Settlement Systems
DFCC	Domestic Foreign Currency Clearing
ECB	European Central Bank
EFT	Electronic Fund Transfer
ICDC	Investment and Commercial Development Cooperation
ICT	Information Communication Technology
IDRBT	Institute for Development and Research in Banking Technology
ITMX	Interbank Transaction Management and Exchange System
KIE	Kenya Industrial Estate
NFS	National Financial Switch
NPS	National Payment System
NSS	National Switch System
NPCI	National Payment Corporation of India
NIBSS	Nigeria Inter-Bank Settlement System
NCEB	National Conference of E-Business
MACSS	Mauritius Automated Payment and Settlement System
MICS	Multi Integrated Cash Service
POS	Point of Sale
PSS	Primer Switch Solution

RBI	Reserve Bank of India
RTGS	Real Time Gross Settlement
SACCOS	Saving and Credit Cooperative Societies
TTP	Time Triggered Protocol
UAT	User Acceptance Test

Definition of Terms

Issuer	The Bank where the specific Customer (Cardholder) belongs
Acquirer	The Bank which accepts a card of the issuer bank customer
Remote ONUS	Transaction where an issuer bank customer is being entertained with other bank ATM terminals
OFFUS	Transaction where a bank acquires other bank cardholders to transact with its ATM terminals
ONUS	Transaction where issuer and acquirer bank is the same
HSM	Equipment which provides cryptographic functions to support data security
Electronic Journal (EJ)	Text based report which resides in the acquirer bank ATM Terminal which will be used to settle a dispute
Chargeback	When the issuer bank takes the money of its customer from the acquirer bank when the request has passed 8 days.
Presentment	A request which will be initiated from the Acquirer bank side in response to the charge bank
Re-presentment	A request which will be initiated from the Issuer bank in response to the presentment
Arbitration	A process initiated when acquirer and issuer banks fail to resolve the disputes by themselves and the payment scheme (Ethiopian National Bank in this case) interferes to settle the dispute.
Cardholder	A customer of the issuer bank which holds ATM Card.
Payment System (Switch)	The System which gives e-banking services (e.g. ATM Service) to Customers

National Switch	The payment system for National Bank of Ethiopia, which connects member banks' payment system.
Switched member banks	Commercial banks that have their own private switch and connected to the National Switch System
Hosted member banks	Commercial banks that are directly connection to Ethswitch (those who doesn't have their own switch)
PSS member banks	Commercial banks which are sharing a single switch and then interfaced with the National Switch System

1. Introduction

1.1. Background of the study

The advancement of information communication infrastructure and subsequent spread of digital technology innovations; as apparent to everyday life and other sectors are also transforming the financial sector landscape and altering the prevailing operational models as well as how customers interact with financial service providers.

In recent years the very nature of banking is changing. What used to happen only in branches can now happen anywhere in the world at any time and through any delivery channel a customer might choose (ATMs, telephones, personal computers). Thus, traditional banking network consisting of physical branch infrastructure is more and more threatened by information technologies represented by automated forms of interaction with the client (ATMs, call centers, online banking, mobile banking) that involve relatively lower costs and allow customers to choose from alternate delivery channels (Darlington, 1999).

The digital banking disruption is redefining the conventional financial service delivery approach towards building and advancing virtual strategies to address the market instead of having an extensive network of brick and mortar branch to gain a competitive advantage and enhance financial access. Moreover, the introduction of another alternative models of financial service delivery and the ensuing competitive pressures as well as demand for simplistic financial services on the part of customers are obliging banks to overhaul their service delivery modalities and respond to the wave of changes to stay in the game.

The exposure of customers to variety of technology based service experience has also shifted the conventional paradigm of financial service providers dictating the customer access and expectation for quality services. Presently, customers are demanding more from their financial service providers.

Keeping pace with these changes are an inevitable ultimatum posed for the service providers to improve their service delivery, cost and operational efficiency so as to satisfy their customer needs and undoubtedly expand their customer base and outreach.

As a result, banking industry actors are more and more involving in digitizing their services as well as developing value added product offers that suit the customers' need through trailing evolving market trends and using the available broad mechanisms of ICT tools for customer interaction.

The forms of digital banking services are offered in variety of channels from time to time subsequent to the technological advancements. However, the most prevalent electronic banking can be described based on the type of services and/or platforms it uses broadly include; Card Banking (Debit, Credit and prepaid), ATM and POS service, Mobile financial service (Mobile banking or Mobile wallet service), and Internet banking (personal and corporate).

In response to the changing payment scheme, all Ethiopian Banks are delivering electronic banking services through a Payment System (Switch), which is a system that can interface with POS terminals, Automated Teller Machine (ATM), Mobile Banking & Agency Banking, Internet Banking & consolidate all electronic transactions and then intelligently channel them to one or more payment processors for authorization and settlement, which intern is outsourced from different vendors.

Of all the commercial banks in Ethiopia (Currently 17), six of them are delivering e-banking products through their own switch (Bank of Abyssinia, Abay Bank, Dashen Bank, Wegagen Bank, Zemen Bank and Commercial Bank of Ethiopia), six of them are sharing the same switch (PSS Member Banks: Awash International Bank, United Bank, Nib International Bank, Addis International Bank, Cooperative Bank of Oromia and Berhan International Bank), and the rest five banks are connected through the National e-payment system (Bunna International Bank, Debub Global Bank, Enat Bank, Lion International Bank and Oromia International Bank) to deliver e-banking services.

National Payment system then integrates all these commercial Banks opting to establish central and national switch system. National Payment system is a concept of carrying out payment transaction among interconnected commercial banks in a country, with a view to enhance financial service provision. According to (Masela, 2012), National e-payment is a broad concept, which includes "System, mechanisms, institutions, agreements, procedure, rules, and laws, that comes into play, while an end user is on service".

The National e-Payment Switch is one of the four major components of the National Payment Systems strategy being implemented by the National Bank of Ethiopia, in which modernization is at the core.

The National Payment Systems strategy includes the following four components:

- ✓ Real Time Gross Settlement System
- ✓ Automated Clearing House
- ✓ National Switch
- ✓ Central Security Depository

Interconnecting 17 Commercial Banks comes with its own opportunities and challenges in terms of Security, User acceptance, ease of access, infrastructure and others. So, the study tried to look at those details exhaustively.

1.2. Background of the Organization

EthSwitch is the name given for the association of Ethiopian commercial banks as per the instruction of National Bank of Ethiopia to form a central and national switch system focused on electronic retail payments. It is the owner and operator of the national electronic retail payments switch of Ethiopia, National e-Payment Switch. This has been legally established with the purpose of providing electronic retail payment switching and clearing, card issuance and management, and infrastructure services in country at large

EthSwitch is the sole clearing house for interbank electronic retail payments in Ethiopia. On an ongoing basis, it does settlement between the banks. Whenever there is an inter-bank transaction, the transaction will come to the EthSwtitch infrastructure and will be completed within its infrastructure.

BPC was the prime contractor for the switch (SmartVista) and related software solution. The implementation was started in September 2014. For BPC the scope of the project was mainly on the software side. This included deployment and implementation of interfaces with all the banks. The CEO of EthSwitch, Bizuneh Bekele, said, “It is a complex task. It is not just deploying the software and making it work.” For BPC it was almost literally as many implementations as there

were banks. Each of the six banks with their own switch had to be individually integrated into EthSwitch. For the six banks using their individual core banking system, integration had to be done individually again. And finally the consortium switch had to be integrated.

According to the website of NBE, the implementation was also divided into three phases. The first phase involved go-live of two ATM products: cash withdrawal, balance inquiry, reversal; and go-live of six POS products including pre-authorization, purchase, refund, reversal, balance inquiry, pre-authorization completion. But only the ATM services were completed after duration of more than two years. This was enabled by the interoperability between the 17 banks and the central bank. After this, bank card holders in Ethiopia started to withdraw their money or check their balance on any ATM deployed by any bank, irrespective of the bank which issued their card. The next two phases are currently under implementation and UAT.

1.3. Statement of the Problem

Outsourcing a switch and delivering e-banking services with only own infrastructure limits customers to smoothly transact with their cards anytime and anywhere apart from the fact that it will be capital intensive to introduce new services. Besides, customers can only be entertained with Bank's ATM or POS terminals which issued their cards.

The Adoption of NPS; however will broaden the range of payment instruments and services by establishing a central switch system. It will improve cost efficiency and enhance the interoperability and resilience of banking, payment and security infrastructure.

Nonetheless, there might as well be challenges on the adoption process presuming that there might be lack of acceptance by the customer, ignorance, infrastructure issues (Network and Power), dispute and chargeback handling process, settlement and others.

Furthermore, the Ethiopian financial sector has not been studied to any great extent, from the perspective of provision of electronic banking service, through the national payment system. Though the national payment system has been in operation for almost three years, No research has been conducted on the challenges and opportunities associated with it. Thus, this study attempts to fill this gap and contributes to the literature on the electronic banking service in Ethiopia.

Therefore, the main purpose of this study is investigating the challenges and opportunities in the service delivery, Dispute Handling process, Customer awareness, implementation and other details of national payment system in Ethiopia.

1.4. Research question

This study intends to explore the following three research questions:

1. What are the opportunities in the central switch system?
2. What are the challenges associated with service delivery and implementation of the central switch system?
3. How effective is the National e-payment switch, in addressing e-banking service requirement of customers?

1.5. Objective of the study

1.5.1. General Objective

The general objective of the study is to assess the challenges and opportunities associated with the adoption of National Payment System in Ethiopia.

1.5.2. Specific Objective

The following specific objectives were considered for the study.

1. To identify the challenges of adopting the National Payment System
2. To identify the opportunities of adopting the National Payment System
3. To evaluate the effectiveness of the solution in addressing customers' needs on electronic channels.

1.6. Significance of the study

The study will acquaint national payment system member banks and Ethswitch on the current opportunities for further exploitation and it will provide knowledge on setbacks of the solution so that proper measures could be taken to avoid them. It will also give direction on the coming implementations to consider the possible challenges so as to create a more suitable service to e-payment customers.

As there are no studies done on the opportunities and challenges of adopting national payment system, it contributes to the national e-payment system literature. It could also be used by other researchers to make further studies on what this study lacks to point out.

1.7. Scope of the study

Though there are many areas that could be considered or studied on NSS, this study will be limited to address only the opportunities and challenges of adopting the NSS. Furthermore, the study will address selected Ethiopian Commercial Banks.

2. Literature Review

2.1. Theoretical Review

2.1.1. The Concept of National Payment System

"National Payment Systems (NPS) refers to instruments facilitating exchange of assets and service between economic units, legal and physical infrastructure, the organizational structure, the operational procedures and the communication network, used to initiate and transmit payment information from payer to payee and to settle payment. That is, transfer of money" (Banilo, 1996).

"A national payment system is one of the principal components of a country's monetary and financial system and, therefore, crucial to a country's economic development" (Kipptepkut, 2007). If done well, the development of the national payment system can reduce overall transaction costs and expand the opportunities for commercial and financial transactions in an economy. "Introduction of a cheaper payment instrument such as electronic payments may be welfare improving" (Calladoy, Hromcováz & Utrero, 2010).

One of the prime concerns of central banks is that, the efficient operation of the national payment system. Electronic payments are typically cheaper than paper-based or cash payments, pricing this transaction should speed up the shift to electronics.

2.1.2. Motives for National Payment System Reform

In this time around, the motive behind nation's towards crafting a national payment system reform may take various forms which mainly driven by the need for development in the payment system arena and events. "These events relates to; development in the financial and non-financial sectors that presents new needs and opportunities for payment instruments and services; increased awareness about payment systems and their risks, including those related to the security of payment information, which have raised concerns about financial stability; internal and external pressure from national payment system reform in other countries, the entry of foreign banks, or a policy to comply with regional and international standards for payment and securities systems; political, economic development, such as the evolution of economic and monetary unions among countries, and the country's re-entry into global trade and financial markets" (CPSS, 2006).

"In the wake of these events, the existing system is found to be inadequate for the emerging payment needs of the economy, and reform initiative are therefore undertaken" (Solis and Trundle, 1999)

2.1.3. Trends in National Payment System Development

National payment system development initiatives are generally strives for improvements in system wide safety and efficiency. In general, these development initiatives have been both demand driven (e.g. new instruments and services) and supply driven (e.g. new cost reducing standards or technologies).

The trend of national payment system development exhibited on some of the following basic areas i.e. how convenient the payment service to the public at large, how cost effective it is, while carrying out such financial transactions, there long-term effect for financial inclusions. According to CPSS (2006), the national payment system might focus on “the gradual emergence of a broader range of payment instruments and services, better access for financial institutions to low cost settlement credit and better liquidity saving mechanisms in payment settlement systems, the interoperability, interrelationships and resiliency of payment, securities, foreign exchange, telecommunications and the bank’s internal infrastructures to facilitate straight through processing of payments, the design of payment infrastructure arrangements to better contain legal, operational and financial risks for participants and to improve the cost efficiency of providing infrastructure services to them, the development of a suitable regulatory regime for the national payment system and an effective oversight function in the central bank, more efficient, more stable and better organized markets for delivering and pricing various payment services to the users"

2.1.4. National Payment System Transaction Flow

National Payment System Transaction flow starts with three concepts or transaction types: ONUS, Remote ONUS and OFFUS. There are also three parties involved on a single transaction: Acquirer, Issuer, and Payment Gateway (e.g. NSS).

The below figures shows the flow for each transaction types:

Figure 2.1.4.1 OFFUS transaction

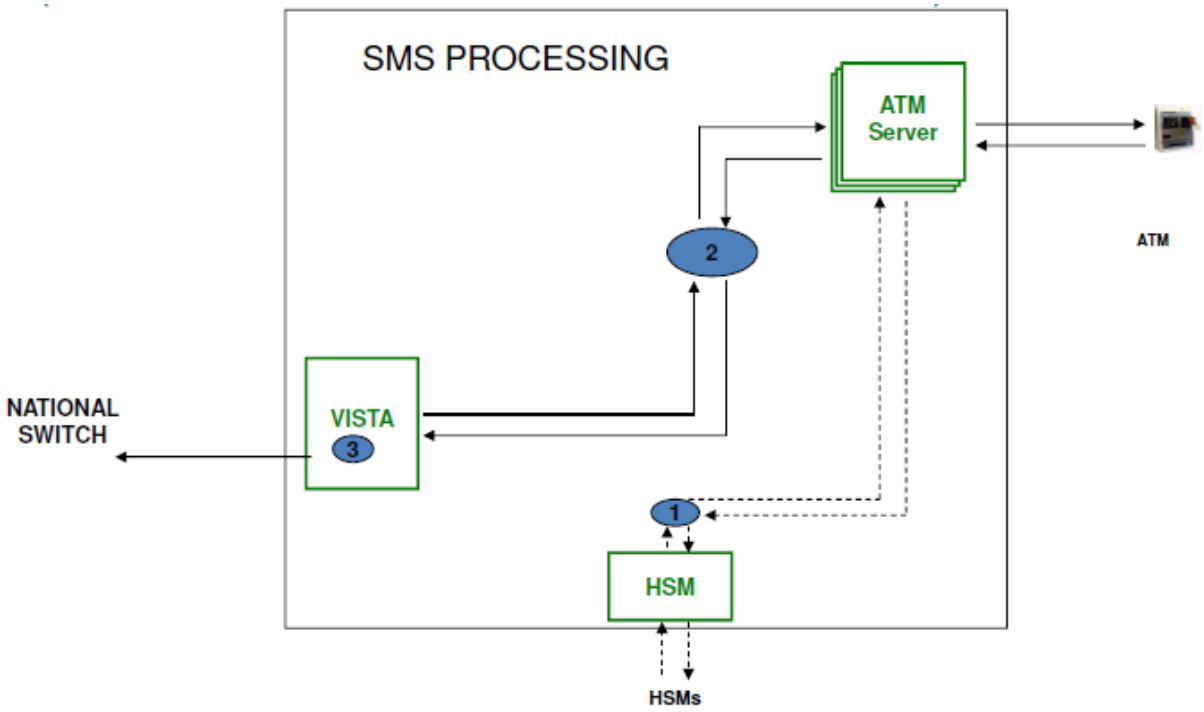
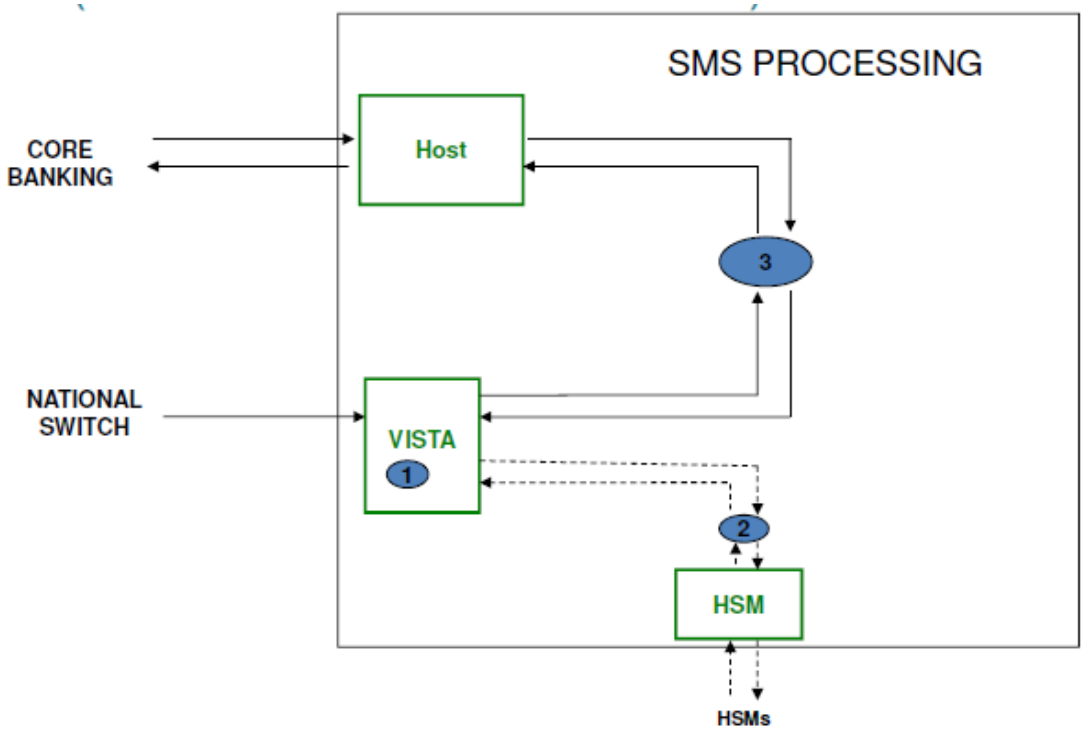


Figure 2.1.4.2 Remote ONUS transaction



Note: ONUS transaction doesn't involve NSS as an interface. Here the acquirer and issuer is the same bank.

2.1.5. Challenges of National Payment System

First of all, when we look at the development process of national payment system, it is stated that, "Earlier experience of many countries points to a number of issues that need to be addressed if the development process for a national payment system is to proceed smoothly and effectively. Among the most common are: inadequate knowledge about the overall breadth of the basic elements relevant to a national payment system, resulting in ad hoc changes in the system, and limited vision, leadership and trust among the principal stakeholders, limited information about the emerging payment needs and capabilities of the developing economy and the existing system's ability to meet them, weak support and commitment to reform from public and private stakeholder groups due largely to inadequate consultation, limited expertise and financial resources for developing and implementing reform initiatives, legal, regulatory and other public policy impediments to development that compound the natural risk aversion towards new and innovative payment arrangements" (Summers, 1994)

The national payment switch has a significant advantage, but there remains a challenge in understanding of what the functionality of a switch actually is, and availability of basic infrastructure i.e. power and telecom services.

The payment system of any country, though advanced and sophisticated, does face various risks, viz. bank failures, frauds, counter-party failures, etc. Such aberrations could trigger a chain-reaction that might ultimately result in disruption and distrust of the payment system. For example, if one large payment transaction cannot be settled, it disturbs other transactions leading to failure of the institutions involved in the process ultimately upsetting the entire payment system in the country. Such systematic and cascading breakdown of the payment system can hinder efficacy of monetary policy and badly impact confidence in the financial system. Minimization of systemic risk is therefore a critical challenge facing the regulators. The central bank in any country is therefore taking suitable actions to reduce systemic risks and is continuously engaged in promoting a sound and efficient payment system.

"The interoperability (National Payment System) "levels the playing field" it is extremely difficult, for example, for one bank to develop meaningful product feature that competitively

differentiate a check, or direct debit, when the instrument needs to interoperate with offering from other banks" (Benson & Loftesness, 2012).

In general, financial institutions face difficult challenges and opportunities when they require a complete view of each customer relationship and how to deliver, more effectively, the correct products and services to each customer. Some of the challenges are: “There is a high volume of transaction generated through various channels, each channel with its own infrastructure (credit cards, deposit accounts, commercial, e-Commerce), fraud is becoming more pervasive and complex with each channel and between multiple channels consolidation, both within the industry and within individual organizations, brings with it the need to rationalize infrastructure.

Often large financial institutions have duplicate infrastructure within the single company. Current solutions provision the rationalization of duplicate infrastructure onto a single platform (for example, wholesale and retail payments), Increased regulatory intervention is driving up compliance expenses" (IBM, 2008).

Cultural and historical differences in attitudes and the use of different forms of money (e.g. use of credit card in North America and use of debit cards in Europe) complicate the task of developing an electronic payment system that is applicable at international level (Taddesse & Kidan, 2005). According to Taddesse & Kidan (2005), difference in the degree of the required security and efficiency among people of different cultures and level of development aggravates the problem.

Lack of social awareness/lack of familiarity with different technology and lack of sufficient skills to use and implement E-banking system were considered as barriers to adopt E-banking system in Ethiopia. (Bultum, 2014)

Consumer’s confidence and trust in the traditional payments system has made customers less likely to adopt new technologies. New technologies will not dominate the market until customers are confident that their privacy will be protected and adequate assurance of security is guaranteed. (Taddesse & Kidan, 2005). New technologies also requires the test of time in order to earn the confidence of the people, even if it is easier to use and cheaper than older methods.

In the search for any strategic advantage, the business need to focus on a complete view of the customer relationship turns rapidly to a need to consolidate the payment delivery and combine it more effectively with the fraud and risk management.

2.1.6. Opportunities of a National Payment System

A country's financial and economic structure mainly constitutes the major aspects of Payment and Settlement Systems. A payment system is a system which enables payment between two entities i.e. a payer and payee and constitutes clearing, settlement or payment service (Payment Settlement Act, 2007). Humphrey and Setsuya (1995) argued that "there is a need to modernize the payment system and move away from paper-based to electronic mode of payment system to improve efficiency and save cost. According to the estimate of the authors, the cost of any nation's payment system may be equivalent to about 3 percent of its Gross Domestic Product (GDP)". "An efficient payment system acts as an enabler for speeding up liquidity flow in the economy, apart from ensuring proper utilization of limited resources it also eliminates systemic risks" (GOI, 2007).

According to Freeborn & Robert Glover (2016) we can raise plenty of reasons, why national payment switch should be a priority for countries looking to digitize their economies:

A national switch can bring about cost savings: While a nation switch is in place, commercial banks will gain a cost advantage for their technological investment.

The establishment of a National switch can help banks to innovate: A shared infrastructure, for example, will allow participating banks to introduce new functionality for only a fraction of the cost compared to individual projects, and at a much faster pace. This can nurture interoperability.

A national payment switch will stimulate growth of the cashless society: growing card payment acceptance and card usage rapidly. This allows greater control over card payment transaction at a national level.

Fraud Monitoring: Transactions are audited, monitored for fraud and money laundering, and sophisticated analytics on transaction data and patterns can be carried out to prevent future fraudulent activity.

Bringing cash transaction into the electronic payment system: means that a greater proportion of economic activity cab be taxed. The direct cost of handling cash throughout the economy is reduced as its volume falls.

The National Switch leverages the banking community's technology investments. It effectively multiplies bank's outreach points, which can significantly increase financial access for clients. According to Berger and Walden (opportunity International, 2009), "customers in Africa pay a transaction fee when they use another bank's ATMs, just as in developed economies. However, the cost is presumably offset by increased convenience and reduced travel time and expense. In addition, a network bank receives revenue whenever customers from other banks use its ATMs".

"A robust environment of interoperability in payment system benefits all participants in the payments' ecosystem, gain revenue from payments in interoperable systems that they may not be able to achieve with closed loop (or non-interoperable) systems. Interoperability in payment systems can also produce cost efficiency and enable superior risk management"(Benson & Loftesness, 2012).

Each payment reform has provided opportunities to develop new products. Financial Institutions and service providers should take advantage of the available platforms, reduce transaction cost to customers and enhance access to finance. Banks and primary dealers should market their new products in conformity with the rules and regulations set up these systems rather than looking ways and means to operate outside rules and regulations.

In general, safe and efficient national payment system supports a smooth flow of money in an economy to help create new opportunities for commercial and financial transactions that would not otherwise exist and lower the real and the financial costs of all transactions.

2.1.7. National Payment System for Financial Inclusion

In the late twentieth century, "inequality has often been explored through the concept of social exclusion "(Byrne, 1999). According to (Conroy, 2008), "Based on the assumption that exclusion from access to banking services perpetuates poverty, proponents of financial inclusion are advocating for every person to have, at a minimum, a no-frills bank account.

Financial inclusion is poised to become the new panacea for poverty alleviation, in a manner similar to that of micro-credit and micro-finance some ten to fifteen years ago. "Regardless of the early promise of micro-credit and micro-enterprise, it did not lift the very poor out of poverty" (Cooney and Shanks, 2010).

Broadly speaking," financial inclusion means access to finance and financial services for all in a fair, transparent and equitable manner at an affordable cost" (Sarma, 2008; Solo, 2008). "Financial inclusion aims at drawing the "unbanked" population into the formal financial system so that they have the opportunity to access financial services ranging from savings, payments, and transfers to credit and insurance." (Hannig and Jansen, 2010).

(Fuller and Mellor, 2008) noted that "financial inclusion is the desire to develop 'alternative', welfare-oriented (rather than profit-driven), reliable, affordable and accessible financial services for all sections of the population". Others, however, view inclusion as a "market- driven solution for poverty alleviation" (Alpana, 2007). Financial inclusion is a desired outcome regardless of the motivation behind it as it can help poor people access financial services at a lower cost and reduce the consequences of poverty.

"Bank branches and service points also have to be at strategic points for individuals to be able to locate them. According to the World Bank financial access (2009), "one of the main issues of financial inclusion policies is the distance the individuals have to travel to be able to access these facilities. (Nwachukwu and Odigie, 2009) noted that "people would save more if saving institutions were nearer to them than if they were far".

Technological means like ATMs, Internet banking, debit cards and mobile banking facilities that allow bank customers to easily reach and utilize banking services can also be in place to help and encourage people of the benefits of banking system.

"An exclusive focus on technology would still lead to a somewhat short-sighted regulation. Both efficiency and safety of payments, on the one side, and financial inclusion, on the other, need a much more articulated consideration. Focus must also be put on the structure of the market and the role of various stakeholders, putting innovative instruments within the wider context of retail payments as a whole, or the even wider context of the national payment system" (Chiara, 2015).

"Financial inclusion is an objective of rising importance in many places and payment regulators need to consider how to make their payments systems more inclusive. An increasing number of other regulatory agencies, such as competition authorities, are also showing interest in the functioning of the national payment system" (Brian and David, 2013).

2.1.8. Framework of the Literature

Different literature tried to confirm that, having a national switch in a certain country would create a significant opportunity, which broadly includes financial stability, financial inclusion, cost saving, convenient customer service, while there are also challenges, with regard to infrastructure, customer awareness and fraud, which categorized as operational risks.

In a nutshell, safe and efficient national payment system supports a smooth flow of money in an economy to help create new opportunities for commercial and financial transactions that would not otherwise exist and lower the real and the financial costs of all transactions.

2.2. Empirical Review

Though there are many papers which dwell on National Payment System, there are none that studied the opportunities and challenges. But in this paper, experience of some countries is presented.

Central Bank of Kenya

Reforms in payment systems are broadly based on overall objective of attaining safety, efficiency and reliability. This may be achieved through provision of "an environment in which payment system may function effectively and efficiently and removal of barriers as appropriate, to foster risk reducing payment systems initiatives" (Federal Reserve Bank Board, 2003)

According to Central Bank of Kenya (2004), National Payment System Framework and Strategy, Payments system in Kenya comprises institutions, laws, service providers and instruments. The major institutions that provide payment services include: The Central Bank, Commercial Banks, and Non-Bank Financial Institutions (Insurance companies, hire purchase companies, among others), Post Office Savings Bank, Postal Corporation of Kenya, Specialized Financial

Institutions (ADC, AFC, ICDC and KIE), SACCOS, Building Societies, Pension Schemes and Mortgage Finance companies.

Central Bank of Nigeria

The implementation of the central switch using will create a more efficient national payment infrastructure by electronically switching retail payment transactions between commercial banks. The Nigeria Inter-Bank Settlement System (NIBSS), established by the Nigerian Bankers Committee, will operate the central switch that will also be used for switching transactions between other third-party processors. They system will allow for greater efficiency to support the increase in citizens entering the banking system and the anticipated growth in domestic card payment volumes. Paul Lawal, "The successful deployment of the Nigeria Central Switch is of national importance, as a successful national payments infrastructure has been proven to be crucial to the economic development and GDP growth of a country. It was essential to select the right software partner to assist us in our objective. ACI's extensive track record combined with the depth of functionality in its solution, the high standard of its professional services staff and its strong regional presence led us to select them as our software partner" (central bank of Nigeria, 2014)

As the Nigeria Central Switch, NIBSS is responsible for the interoperability between the various players in the financial system. Interoperability involves the ability of the various players Banks, Mobile Payment Operators, Non-Banking Financial Institutions, Payment Terminal Providers, Card Acquirers, Government Institutions etc., and their customers to send, receive and process funds, documents and other instruments electronically through a common channel – NIBSS. NIBSS also ensures that the central switch facilitates the entry of new players into the financial industry to seamlessly plug into the financial services sector for easy operations thus creating a level playing field for all financial institutions and their customers, (central bank of Nigeria, 2014)

Bank of Mauritius

The Bank of Mauritius is empowered under the Bank of Mauritius Act to safeguard the safety, soundness and efficiency of payment, clearing and settlement systems as well as protect the interest of consumers. In the discharge of its responsibility, the Bank started modernizing

payment systems in the country in late nineties with the introduction of a real time large value payment and settlement system, the Mauritius Automated Payment and Settlement System (MACSS), as a landmark in 2000. The total value of payments made at points of sale (POS) in Mauritius approximated Rs146 billion in 2015 with an estimated amount of Rs3.6 billion shared as fees among payment systems operators. As part of its mandate to ensure financial stability, the Bank sees the necessity to implement a National Payment Switch with a view to promoting a cost-effective payment system which will ensure the protection of consumers and enable all players to operate on a level playing field.

Reserve Bank of India

According to (Bhatnagar, 2014), "The Institute for Development and Research in Banking Technology (IDRBT), established by Reserve Bank of India in 1996 launched the National Financial Switch (NFS), to provide a congenial platform for growth and development of the ATM delivery channel. National Payments Corporation of India (NPCI), on authorization by Reserve Bank of India, took over the operations of National Financial Switch (NFS) from IDRBT from December 2009. NFS is a shared ATM network that interconnects NFS members and ATM switches". NFS covers 596-member banks with about 215,000 ATMs as of December 2015. NFS approved transaction volume for Dec 2015 was 327 million (RBI 1998). Under the RuPay domestic card payment scheme in 2011-12, NPCI was granted approval under the PSS Act, 2007 to issue RuPay cards through banks in India. The objective behind introducing a domestic card scheme is to ensure a healthy competition with other international card payment networks and efficient price discovery (RBI, Annual Report 2011-12).

Bank of Japan

The Bank of Japan (BOJ) has established and operated the Bank of Japan Financial Network System (BOJ-NET) since October 1988 in order to promote the efficiency of banking operations as well as stability of the industry’s payment system.

"Interbank alliances concerning cash card transactions in Japan have been built through joint networks of each industry since 1990. Furthermore, the “MICS” network that links each joint network was established and cross industry alliances were commenced from February 1990. Later, the MICS network and some joint networks were moved to the integrated ATM Switching

Service which started operation in January 2004. The Switching Service provides services to financial institutions other than participants of MICS, thus realizing a broader CD and ATM network scheme" (Japanese Bankers Association, 2012).

Bank of Thailand

"Payment 2004, a road map for Thai Payments System was proposed in 2001 as a co-operative effort on part of the central bank and the market to review the current payment infrastructure and to chart a strategic map to lay down strong future foundations for the country's payment systems" (NCEB 2002). With this, the country moves to the development of national payment platform as a collaborative effort by the Bank of Thailand and representatives from Thai's Banker Association, national research institutes and academy.

The purpose of the ITMX (Interbank Transaction Management and Exchange System) is to develop a common payment platform based on an appropriate interoperable standard to reduce duplicative payment infrastructure investments and to support the growth of e-commerce.

According to (Arrowsmith, 1986), "meeting the challenges for effective development of the national payment system has not been equally successful for all countries undertaking the reforms. The fundamental challenges, however, are often aggravated by a "narrow vision" of the system's complexity, limited knowledge on development, information sharing and inadequate planning by key stakeholders in the national payment system. Another problem is that too often, national payment reforms foci are limited to installments, technologies and infrastructure-the supply side structure of the payment transfers-with little attention paid to the institutional changes necessary to the support of these reforms and the conditions influencing the demands for new instruments and services".

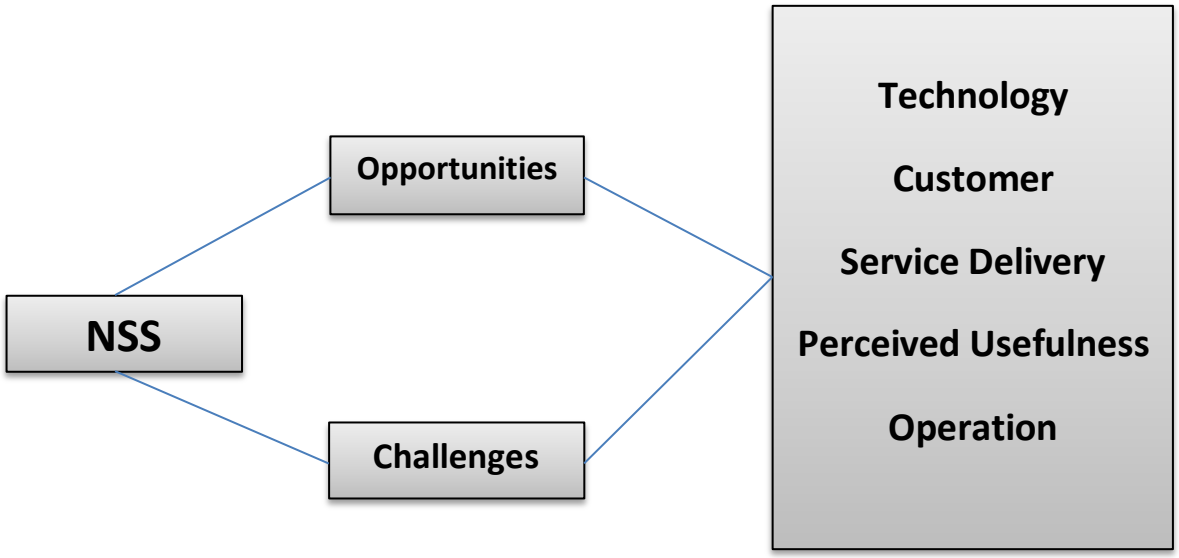
The empirical review stated above emphasizes strategic framework of various countries in adopting the national payment system. Though any specific papers on Challenges and opportunities of NPS are not yet done, the researcher will try to assess what opportunity has been brought by the national payment system and what are the challenges that it is facing.

2.3. Conceptual Framework

The researcher assumed that the independent variables: *Technology*, *Customer*, *Service Delivery*, *Perceived Usefulness and Operation* best describes the conceptual framework for the study.

The below figure depicts how the variables adds up to the opportunities and challenges of the adoption of National Switch System in Ethiopia.

Figure 2.3.1 Conceptual Framework



3. Research Methodology

3.1. Research setting and design

For the purpose of this study, Descriptive research based on survey approach was used. Since the assessment is carried out on the national e-payment switch, survey method can be used to have an organized data for the study. Descriptive research design helps to provide answers to the questions of who, what, when, where, and how associated with a particular research problem. Descriptive research is used to obtain information concerning the current status of the phenomena and to describe "what exists" with respect to variables or conditions in a situation.

3.2. Study Area

The study focuses on the challenges and opportunities associated with the adoption of National Switch System in Ethiopia. As of this very moment, NSS has only launched two ATM services: Withdrawal and Balance Enquiry. But implementation of other services on ATM and POS are done and UAT is being carried out.

Therefore, the study has only tried to address the opportunities and challenges of the services which went live (ATM Withdrawal and Balance Enquiry) and also the challenges of other services under implementation and UAT phase.

3.3. Target Population

E-Banking employees from eight commercial banks and Ethswitch employees were considered for this study. As for commercial banks, the selection of target population then divided according to member type of the banks: Switched member banks, PSS member banks and Hosted member banks. Furthermore, professionals who are working under Card Operation unit, Merchant Acquiring and Management unit, Mobile Banking and Internet Banking Management unit, Dispute, chargeback and settlement unit and employees who are working on the ebanking systems (System Administration unit) has been considered.

3.4. Sampling Technique

The researcher employed convenient sampling technique; employees working at e-banking departments of selected commercial banks and employees of Ethswitch. The total number of population size is about 129.

To draw the population size, the researcher first segregated the commercial banks in terms of the way they are interfaced to the National Switch System: Hosted member banks, Switched member banks and PSS member banks. From the Switched member banks; Bank of Abyssinia, Commercial Bank of Ethiopia and Dashen Bank were chosen. Likewise; Awash International bank, United Bank and NIB International Bank were chosen to represent the PSS member banks and finally Oromia International Bank and Bunna International Bank represented Hosted member banks.

The below table shows the total population size drawn from the selected commercial banks and Ethswitch employees.

Table 3.4 Commercial Banks and Population Size

No	Commercial Banks / Ethswitch	Size of Ebanking employees
1	Commercial Bank of Ethiopia	30
2	Dashen Bank	25
3	Bank of Abyssinia	18
4	Awash International Bank	17
5	United Bank	12
6	Nib International Bank	10
7	Oromia International Bank	6
8	Bunna International Bank	5
9	Ethswitch	6
	Total Population Size	129

Bearing this, the researcher has chosen a simplified sample size determining formula by Taro Yemane (1967). Hence, sampling error of 0.5 and confidence interval of 95% was chosen for the purpose of this study.

Taro Yemane formula for sample size determination:

$n = N / [1 + N(e)^2]$

Where: n = Sample size

N = Total Population size and

e = Sampling error

Substituting the variables:

$n = 129 / [1 + 129(0.5)^2]$

n = 98

3.5. Research Instrument

Structured questionnaire was designed to collect participants' opinion opting to find which statements are adding to the opportunities brought by the National Payment System and which to the challenges.

3.6. Data Collection Technique

For the purpose of this study, a close ended questionnaire were used as the measuring instrument as it helps the researcher to reach the respondents in less cost and time and it also provides an opportunity to respondents to express their feelings freely. The layout of the questionnaire was made very easy to encourage the meaningful participation of the respondents. Furthermore, a blank space was left to avail an open door for them to make sure that points which are missed by the researcher are addressed. The scaling approach used is five point Likert scale with response categories (strongly agree, agree, undecided, disagree, and strongly disagree) as it is the most widely used approach.

Questionnaires were delivered to respective commercial banks, which from there, distributed through immediate supervisors. And the data was gathered from a total of 98 employees working at e-banking operational area of eight selected commercial banks and Ethswitch.

3.7. Data Analysis

To analyze and present the data obtained from the questionnaire, the researcher employed Statistical Package for Social Science (SPSS) software.

To interpret the data, Frequency, Percentage, Mean Score and Standard deviation values are used. In order to measure the average opinion that the respondents given on the subject provided by the questioner, one can use mean and likewise Standard deviation is also used to show how the value obtained by the participants' opinion dispersed from the mean.

3.8. Validity and Reliability of the study

3.8.1. Validity

Validity refers to whether the statistical instrument measures the purpose it is intended to measure, i.e. accuracy of measurement (Saunders et al. 2000). Validity refers to the extent to which an instrument asks the right questions in terms of accuracy. Validation was done so as to ensure if instruments to be used in collecting data enabled to collect the information needed. The validation was done by gathering opinions from my supervisors, from those who directly working in respective departments and who supervise the operations.

Moreover, the questionnaire has been carefully designed and tested with a few members of participants for further improvement. In this regard, feedback has gathered about clarity of a sentence, correctness of a language and grammar, and also whether the designed instrument can fully assess the research topics prior to distributing the questioner. And based on this, some amendments has been done on the questionnaire.

3.8.2. Reliability

Reliability refers to whether a measurement instrument is able to yield consistent results each time it is applied (Saunders et al., 2000). It is the property of a measurement device that causes it to yield similar outcome or results for similar inputs. This implies that responses to a reliable survey will vary because respondents have different opinions, not because the questionnaire items are confusing or ambiguous. The researcher started the data analysis by examining the reliability and validity of the sample data.

In this regard the researcher believed that this study is reliable since the respondent were selected based on their experience on electronic banking in general and their specific exposure on national e-payment system, while their answer expected to be credible.

Given all the above facts, the researcher has conducted reliability analysis using Cronbach's coefficient alpha for the entire set of statements and found to be 0.933, which is higher than the acceptable threshold value of 0.700. The reliability result for the research topic is presented below which confirms the scale is considered to be reliable

Table 3.8.2.1 Reliability of Technological Opportunities

Scale: Reliability of Technological Opportunities

Case Processing Summary

		N	%
Cases	Valid	98	100.0
	Excluded[a]	0	.0
	Total	98	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.719	5

Table 3.8.2.2 Reliability of Opportunities Related with Customers

Scale: Reliability of Opportunities Related with Customers

Case Processing Summary

		N	%
Cases	Valid	98	100.0
	Excluded[a]	0	.0
	Total	98	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.778	6

Table 3.8.2.3 Reliability of Opportunities Related with Service Delivery

Scale: Reliability of Opportunities Related with Service Delivery

Case Processing Summary

		N	%
Cases	Valid	98	100.0
	Excluded[a]	0	.0
	Total	98	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.794	5

Table 3.8.2.4 Reliability of Opportunities Related with Perceived Usefulness

Scale: Reliability of Opportunities Related with Perceived Usefulness

Case Processing Summary

		N	%
Cases	Valid	98	100.0
	Excluded[a]	0	.0
	Total	98	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.915	4

Table 3.8.2.5 Reliability of Opportunities Related with Operation

Scale: Reliability of Opportunities Related with Operation

Case Processing Summary

		N	%
Cases	Valid	98	100.0
	Excluded[a]	0	.0
	Total	98	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.904	6

Table 3.8.2.6 Reliability of Technological Challenges

Scale: Reliability of Technological Challenges

Case Processing Summary

		N	%
Cases	Valid	98	100.0
	Excluded[a]	0	.0
	Total	98	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.709	9

Table 3.8.2.7 Reliability of Challenges Related with Customers

Scale: Reliability of Challenges Related with Customers

Case Processing Summary

		N	%
Cases	Valid	98	100.0
	Excluded[a]	0	.0
	Total	98	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.788	9

Table 3.8.2.8 Reliability of Challenges Related with Service Delivery

Scale: Reliability of Challenges Related with Service Delivery

Case Processing Summary

		N	%
Cases	Valid	98	100.0
	Excluded[a]	0	.0
	Total	98	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.776	5

Table 3.8.2.9 Reliability of Challenges Related with Perceived Usefulness

Scale: Reliability of Challenges Related with Perceived Usefulnes

Case Processing Summary

		N	%
Cases	Valid	98	100.0
	Excluded[a]	0	.0
	Total	98	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.735	4

Table 3.8.2.10 Reliability of Challenges Related with Operation

Scale: Reliability of Challenges Related with Operation

Case Processing Summary

		N	%
Cases	Valid	98	100.0
	Excluded[a]	0	.0
	Total	98	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.789	9

Table 3.8.2.11 Aggregate Reliability

Scale: Aggregate reliability

Case Processing Summary

		N	%
Cases	Valid	98	100.0
	Excluded[a]	0	.0
	Total	98	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.933	62

3.9. Ethical Consideration

The researcher has taken the ethical aspect of the paper very seriously and the below points were considered throughout the whole process.

- ✓ Respondents were clearly communicated about the objective of the study before they were asked to give their opinion
- ✓ Respondents were not asked their name, race, religion and etc.
- ✓ The questionnaire was distributed after getting the consent of the commercial banks and Ethswitch

Furthermore, the finding of the research is presented as it stands in the outcome.

4. Result and Discussion

4.1. Survey Result

The questionnaire for this study was distributed to eight selected commercial banks and Ethswitch employees. Furthermore, only employees working on e-banking operation and technical personnel were specifically chosen.

Table 4.1 Response Rate

Response Rate

		Gender	Age	Highest level of Education attended	Job Title	Name of Organization	Years of Experience
N	Valid	98	98	98	98	98	98
	Missing	0	0	0	0	0	0

As shown by the above table, out of the 98 distributed questionnaires, all of them were collected successfully to yield a response rate of 100%.

4.2. Demographic characteristics of the respondents

For the purpose of this study, the demographic information of the respondents are comprised of Gender, Age, Educational level, Job title, Name of Organization and their working experience.

Table 4.2.1 Gender of the respondents

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	57	58.2	58.2	58.2
	Female	41	41.8	41.8	100.0
	Total	98	100.0	100.0	

As indicated in the above table, it can be said that most of the respondents were Male, which accounts to 58.2% of the total sample size. Whereas, 41.8% of the respondents were Female.

Table 4.2.2 Age of the respondents

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20 - 30	50	51.0	51.0	51.0
	30 - 40	42	42.9	42.9	93.9
	40 - 50	6	6.1	6.1	100.0
	Total	98	100.0	100.0	

The above table depicts that the largest number of respondents falls within the range of age 20 – 30, which accounts to 51% of the total sample size. Proportional to the first age category, the second largest portion of the respondents' age was from 30 – 40 which holds 42.9% of the sample population, whereas the rest 6.1% falls within age range of 40 – 50.

Table 4.2.3 Education Level of the respondents

Highest level of Education attended

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	First Degree	80	81.6	81.6	81.6
	Master's Degree	18	18.4	18.4	100.0
	Total	98	100.0	100.0	

With regard to the Education level, it can be said that all of the respondents were either First or second degree holders. Bearing this, most of the respondents were first degree holders which shares 81.6% and the rest 18.4% were second degree holders.

Table 4.2.4: Job Title of the respondents

Job Title

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Junior Officer	9	9.2	9.2	9.2
	Officer	44	44.9	44.9	54.1
	Senior Officer	30	30.6	30.6	84.7

	Manager	12	12.2	12.2	96.9
	Director	3	3.1	3.1	100.0
	Total	98	100.0	100.0	

Table 4.2.4 shows the Job title of the respondents where majority of them were in the position of Officer and Senior Officer to account 75.5% of the total sample size. Whereas, the rest are in the position of Junior Officer, Manager and Director with small proportion from the sample size.

Table 4.2.5: Respondents place of work (Name of Organization)

Name of Organization

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	BANK OF ABYSSINIA	14	14.3	14.3	14.3
	COMMERCIAL BANK OF ETHIOPIA	22	22.4	22.4	36.7
	DASHEN BANK	19	19.4	19.4	56.1
	AWASH INTERNATIONAL BANK	13	13.3	13.3	69.4
	UNITED BANK	9	9.2	9.2	78.6
	NIB INTERNATIONAL BANK	7	7.1	7.1	85.7
	OROMIA INTERNATIONAL BANK	5	5.1	5.1	90.8
	BUNNA INTERNATIONAL BANK	4	4.1	4.1	94.9
	ETHSWITCH	5	5.1	5.1	100.0
	Total	98	100.0	100.0	

As indicated on the above table, the study was made on eight commercial banks and Ethswitch. The commercial banks were categorized as Switched, PSS and Hosted Member banks. Taking this into account, the largest number of the respondents were from the Switched member banks to take 56.1% of the total sample size. While PSS, Hosted member banks and Ethswitch represent 29.6%, 9.2% and 5.1% respectively.

Table 4.2.6: Respondents experience in the bank

Years of Experience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 5 Years	38	38.8	38.8	38.8
	5 - 10 Years	42	42.9	42.9	81.6
	10 - 15 Years	6	6.1	6.1	87.8
	15 - 20 Years	12	12.2	12.2	100.0
	Total	98	100.0	100.0	

The above table shows banking experience of the respondents where 38.8% of them have less than 5 years of work experience and proportional to that, 42.9% have work experience of from 5 – 10 years. Whilst 6% and 12% of the sample population have 10 – 15 and 15 – 20 years of work experience.

4.3. Assessment of the National Switch System Opportunities and Challenges

The main objective of the study is to assess the challenges and opportunities associated with the adoption of National Switch System in Ethiopia. The researcher assumed that five variables best describes the opportunities and challenges of the system presuming that it hasn't been long since the service is launched. Furthermore, the researcher left a blank space to capture other variables which might have been left or truncated.

4.3.1. Assessment of the National Switch System Opportunities

Under this section, the respondents' opinion about the overall opportunities of National Switch System is presented given the five variables and their opinion was based on five point Likert scale.

4.3.1.1. Assessment of Technological Opportunities

Table 4.3.1.1: Assessment of Technological Opportunities

Technological Opportunities							
Items	**Level of Agreement**					**Mean**	**SD**
	SD	**D**	**U**	**A**	**SA**		
Adding new services and features is easier through National	5	11	12	58	12	3.62	1.010

Switch System as only integration is needed from commercial banks	5.1%	11.2%	12.2%	59.2%	12.2%		
Modernization of Payment instruments in terms of introducing new technology	0	6	3	63	26	4.11	.731
	0%	6.1%	3.1%	64.3%	26.5%		
Efficient resource utilization	8	12	15	43	20	3.56	1.185
	8.2%	12.2%	15.3%	43.9%	20.4%		
Flexibility of the National Switch System to introduce New services	4	23	20	37	14	3.35	1.113
	4.1%	23.5%	20.4%	37.8%	14.3%		
Flexibility of the National Switch System to work on different protocols for commercial banks to integrate with (e.g. ISO8583, Webservice)	8	9	25	39	17	3.49	1.133
	8.2%	9.2%	25.5%	39.8%	17.3%		

As indicated on the above table, ease of adding new service/services is considered to be one of the opportunities of National Switch System as more than 70% of the respondents agreed. The same can be drawn for modernization of Payment instruments where more than 90% of the respondents agreed on the point. This shows that National Switch System indeed modernized the traditional way of making transactions through ATM Terminals. This result is supported by Humphrey and Setsuya (1995) who argued that "there is a need to modernize the payment system and move away from paper based to electronic mode of payment system to improve efficiency and save cost"

Regarding the efficiency of the resource utilization, a significant dispersion on the respondents' response has been shown with a standard deviation value of 1.185. Nonetheless, 64.3% of the responses indicate that resources are being utilized efficiently. GOI (2007), has also found the same result regarding the efficiency of resource utilization. It is argued that, while a nation's switch is in place, commercial banks will gain cost advantage for their technological investment. Furthermore, it is also argued that "An efficient payment system acts as an enabler for speeding up liquidity flow in the economy, apart from ensuring proper utilization of limited resources it also eliminates systemic risks"

The respondents were also asked if NSS is flexible to add new functionality to the already existing solution and 52.1% of the respondents were agreed, 27.6% disagreed, while the rest 20.4% of them neither agreed nor disagreed. Furthermore, 57.1% of the responses indicates that NSS is flexible to work on different protocols for commercial banks to integrate with.

4.3.1.2. Assessment of Opportunities related with Customers

Table 4.3.1.2: Assessment of Opportunities Related with Customers

Opportunities Related with Customers							
Items	**Level of Agreement**					**Mean**	**SD**
	SD	**D**	**U**	**A**	**SA**		
Customers can use e-banking services anytime and anywhere using any commercial banks' terminals	9	8	9	32	40	3.88	1.286
	9.2%	8.2%	9.2%	32.7%	40.8%		
National Switch System reduces cost of transaction for customers as one can use any terminal available in the vicinity	10	6	12	53	17	3.62	1.153
	10.2%	6.1%	12.2%	54.1%	17.3%		
Customers found the service provided by National Switch System easy to use	5	12	15	40	26	3.71	1.140
	5.1%	12.2%	15.3%	40.8%	26.5%		
National Switch System provides convenience since it is available 24 hours, 7 days of the week	2	31	3	35	27	3.55	1.253
	2.0%	31.6%	3.1%	35.7%	27.6%		
National Switch System makes it easier to conduct banking transactions	4	6	17	53	18	3.77	.961
	4.1%	6.1%	17.3%	54.1%	18.4%		
National Switch System saves time compared to traditional banking (transaction through issuer bank)	5	6	9	39	39	4.03	1.098
	5.1%	6.1%	9.2%	39.8%	39.8%		

73.5% of the responses reveals that customers indeed found the NSS accessible as one can use any commercial bank's terminal in the vicinity. In addition, 71.4% the respondents have agreed to the point where NSS reduces cost of transaction as there is no need to use transportation or walk a long distance to find issuer bank terminal. The result has been supported by Berger and Walden (opportunity International, 2009) as they stated that, customers in Africa pay a transaction fee when they use another Bank's ATMs, just as in developed economies. However, the cost is presumably offset by increased convenience and reduced travel time and expense. Benson & Loftesness (2012) has also confirmed that, "Interoperability in payment systems can also produce cost efficiency and enable superior risk management"

67.3% of the responses indicates that the services delivered by NSS are easy to use. Moreover, 63.3% of the responses shows that the convenience has also been another opportunity which comes with the adoption of NSS. Regarding the ease of doing transaction, it can be said that the respondents have agreed on the point with more than 72% of them being in a scale of agree. In addition to the above, the response has proved that the introduction of NSS has not only saves cost, but also saves time. This is because, customers are not required to look for issuer bank

terminal which otherwise would have been time taking. 79.6% of the responses supports the point.

4.3.1.3. Assessment of opportunities related with Service Delivery

Table 4.3.1.3: Assessment of Opportunities Related with Service Delivery

Opportunities Related with Service Delivery							
Items	**Level of Agreement**					**Mean**	**SD**
	SD	**D**	**U**	**A**	**SA**		
National Switch System enhance access to finance	0	0	14	65	19	4.05	.581
	0%	0%	14.3%	66.3%	19.4%		
Customers found the accessibility of National Switch System better than visiting a branch	0	6	13	53	26	4.01	.806
	0%	6.1%	13.3%	54.1%	26.5%		
National Switch System gives additional services and features (e.g. TOPUP, Other bank transfer …)	0	9	25	45	19	3.76	.874
	0%	9.2%	25.5%	45.9%	19.4%		
Banks properly maintained customer compliant handling procedure in case of problems experienced with the service	3	8	28	50	9	3.55	.887
	3.1%	8.2%	28.6%	51.0%	9.2%		
National Switch System enables customers to access their account more quickly	0	0	9	66	23	4.14	.556
	0%	0%	9.2%	67.3	23.5%		

According to the respondents, access to finance is one of the opportunities brought by NSS. This result is supported by the respondents where 86% of them agreed on the point. The result has also been supported by Hanning and Jansen (2010) where they argued that, “Financial inclusion aims at drawing the unbanked population to the formal financial system so that they have the opportunity to access financial services ranging from savings, payments, and transfers to credit and insurance.” Likewise, most respondents have agreed on which NSS is more accessible than visiting a branch as it is a no brainer that using e-banking services would be easier than visiting a branch. Furthermore, NSS made the e-banking services more accessible that customers need not have to go to a branch. 80.6% of the responses supports the above statement.

Though NSS is currently giving only two services, Withdrawal and Balance Enquiry, the respondents seems to agree on the point where NSS gives additional services and features. 75.3% of the respondents agreed on the point. Moreover, the result is supported by the findings off GOI (2017) as it is stated that the establishment of National Switch can help banks to innovate in a way that a shared infrastructure, for example, will allow participating banks to introduce new

functionality for only a fraction of the cost compared to individual projects, and at a much faster pace.

It is inevitable that systems might fall for a limited period of time whether due to a technical problem or by some upgrading/patching procedure. But, the point here is: Is there a proper procedure to handle customer complaint. In this regard, the respondents have agreed that banks are properly maintaining customer compliant with procedure. More than 60% of the respondents agreed on the point, 26.8% of them were neutral, while the rest 11.3% of them disagreed. In addition, 91.2% of the respondents agreed on the accessibility of NSS as customers won't be concerned to find the issuer banks' terminals to make a transaction.

4.3.1.4. Assessment of Opportunities related with Perceived Usefulness

Table 4.3.1.4: Assessment of Opportunities Related with Perceived Usefulness

Opportunities Related with Perceived Usefulness							
Items	**Level of Agreement**					**Mean**	**SD**
	SD	**D**	**U**	**A**	**SA**		
Convenient access to banking services	5	0	6	60	27	4.06	.895
	5.1%	0%	6.1%	61.2%	27.6%		
Increases the effective use of time, for example by not having to wait in line	9	8	6	39	36	3.87	1.257
	9.2%	8.2%	6.1%	39.8%	36.7%		
Availability of a wide range of terminals (Terminals of every commercial banks can be used)	5	6	8	43	36	4.01	1.079
	5.1%	6.1%	8.2%	43.9%	36.7%		
Reducing banking costs, such as transportation cost	5	4	3	52	34	4.08	1.002
	5.1%	4.1%	3.1%	53.1%	34.7%		

Regarding the variable Perceived Usefulness, four parameters were considered for this study: Convenience, effective use of time, Availability of wide range of Terminals and Cost. Considering those parameters, the respondents have agreed on all of them sharing a response rate of 88.8%, 76.5%, 80.6%, and 87.8% respectively.

4.3.1.5. Assessment of opportunities related with Operation and Others

Table 4.3.1.5: Assessment of Opportunities Related with Operation

Opportunities Related with Operation			
	Level of Agreement		

Items	SD	D	U	A	SA	Mean	SD
National Switch System stimulates cashless society by bending the common way of doing banking transactions	9	0	24	41	24	3.72	1.119
	9.2%	0%	24.5%	41.8%	24.5%		
National Switch System plays a great role towards NBE's financial inclusion strategy	5	4	21	48	20	3.76	.995
	5.1%	4.1%	21.4%	49.0%	20.4%		
Acquiring own switch is capital intensive, which can be addressed through National Switch System	0	4	23	42	29	3.98	.837
	0%	4.1%	23.5%	42.9%	29.6%		
Acquiring other bank cards became a means of income generation for commercial banks in terms of transaction fees	5	3	11	49	30	3.98	1.005
	5.1%	3.1$%	11.2%	50.0%	30.6%		
National Switch System Increases economy of scale for commercial banks	5	3	7	65	18	3.90	.914
	5.1%	3.1%	7.1%	66.3%	18.4%		
Saves foreign currency and investment of commercial banks and the country	8	8	19	42	21	3.61	1.154
	8.2%	8.2%	19.4%	42.9%	21.4%		

The respondents were asked if the NSS can stimulate cashless society and 66.3% of them were agreed, 9.2% were strongly disagreed while the rest 24.5% of them were neutral. Apart from the fact that NSS is only providing Withdrawal and Balance Enquiry services so far, future developments will include TOPUP, Fund Transfer (A2A, C2C and C2A) and others. And this will eventually contribute to creating cashless society as intended. Additionally, the finding goes with Freeborn & Robert Glover (2016), where they have argued, "A National Payment Switch will stimulate growth of the cashless society: Growing card payment acceptance and card usage rapidly. This allows greater control over card payment transaction at a national level". As per the respondents, National Switch System takes a part to the NBE's financial inclusion strategy which is supported by percentage value of 69.4% to be in a scale of agree. Once again, the finding is supported by World Bank financial access (2009), "one of the main issues of financial inclusion policies is the distance the individuals have to travel to be able to access these facilities. In addition, (Nwachukwu and Odigie, 2009) noted that "people would save more if saving institutions were nearer to them than if they were far".

It begs no question that acquiring or outsourcing a switch needs a huge sum of investment and observing Ethiopian Banks is enough to understand the situation. Some of the banks are hosted by Ethswitch and some of them are members of the consortium switch (PSS). Furthermore, there will be a trade-off between Cost of of a switch and Complexity of joining Ethswitch or PSS in terms of smooth operation. And according to the respondents, National Switch System addresses

the cost issue as being hosted by Ethswitch minimizes the cost of investment for banks. 72.5% of the respondents agreed on the point. Freeborn & Robert Glover (2016) revealed the same as National Switch can bring about cost savings. While a nation switch is in place, commercial banks will get a cost advantage for their technological investment.

80.6% of the responses indicates that NSS became a means of income generation for commercial banks. This is one of the rewarding point as they are getting a transaction fee per transaction while acquiring other bank customers. The same result has been found by Berger and Walden (opportunity International, 2009), "Customers in Africa pay a transaction fee when they use another bank's ATMs just as in developed countries." The mean score and standard deviation value of 3.90 and 0.914 reveals that the banks' economy of scale will increase as any commercial bank can entertain its customers at any ATM terminal in the country's premises. This shows that the banks are giving service for its customers on another bank's ATMs as if the terminals are the property of the banks themselves.

64.3% of the respondents agreed on the statement that NSS saves foreign currency and investment of commercial banks. This can be further analyzed with two important elements. The first one is the switch itself; where not only outsourcing a switch takes away the foreign currency of the country, but also maintenance, additional service implementations and mainly license fees are at the core. The second point is outsourcing of ATM terminals. While one of the opportunities brought by NSS is providing ebanking services to customers irrespective of the ownership of the ATM Terminal to the issuer bank, the need to worry about outsourcing them and expending hard currency might not be putted on the priority list of the banks.

4.3.2. Assessment of the National Switch System Challenges

Under this section, the respondents' opinion about the overall challenges of National Switch System is presented given the five variables and their opinion was based on five point likert scale.

4.3.2.1. Assessment of Technological Challenges

Table 4.3.2.1: Assessment of Technological Challenges

Technological Challenges

Items	Level of Agreement					Mean	SD
	SD	D	U	A	SA		
Technological capability of the Payment System of commercial banks is less to cop up with the features of National Switch System	0	29	21	32	16	3.36	1.077
	0%	29.6%	21.4%	32.7%	16.3%		
Technological capability of National Switch System is poor to introduce and implement new services and features to customers	7	24	21	40	6	3.14	1.084
	7.1%	24.5%	21.4%	40.8%	6.1%		
Employees' skill in terms of technology is minimal and there is poor knowledge transfer	13	16	14	38	17	3.31	1.304
	13.3%	16.3%	14.3%	38.8%	17.3%		
Network and power fluctuation can be considered as a sanction for the successful delivery of e-banking services through National Switch System	5	11	11	36	35	3.87	1.172
	5.1%	11.2%	11.2%	36.7%	35.7%		
Implementation of new services is tough considering mobilization of each commercial bank to actively engage on the integration	7	9	8	48	26	3.79	1.151
	7.1%	9.2%	8.2%	49.0%	26.5%		
Single point of failure: If the interface of National Switch System is down, no commercial bank can support transactions of other commercial bank customers	0	14	28	27	29	3.72	1.043
	0%	14.3%	28.6%	27.6%	29.6%		
High ATM downtime	11	5	17	50	15	3.54	1.159
	11.2%	5.1%	17.3%	51.0%	15.3%		
Lack of proper ATM monitoring tool	8	4	18	41	27	3.77	1.147
	8.2%	4.1%	18.4%	41.8%	27.6%		
Lack of proper Electronic Journal archiving tool	6	8	15	42	27	3.78	1.126
	6.1%	8.2%	15.3%	42.9%	27.6%		

Regarding the technological capability of the payment systems for commercial banks, 49% of the responses indicate that the capability is less to cop up with NSS, while 29.6% of the respondents were disagreed and the rest 21.4% were neutral. The vice versa has also been asked and 46.9% of the respondents were agreed, 31.6% were disagreed and the rest 21.4% were neutral where the capability of NSS is less to cop up with commercial banks payment systems. Moreover, the respondents were asked if employee's skill in terms of technology is minimal and 56.1% of the respondents agreed on the point, 29.6% disagreed and the rest 14.3% of them were neutral.

Infrastructure is one of the challenges for NSS as it has many ends that could lead to service outage. Problem in NSS, Ethswitch infrastructure, Switch and/or Infrastructure of member banks are some of them to mention. 72.4% of the responses supports the above. Besides, mobilizing

commercial banks is another challenge hindering the National Switch System to function better. This can be considered as one of the many reasons why Ethiopay is still not being able to launch new service/services besides Withdrawal and Balance Enquiry. 75.5% of the respondents agreed on the above statement, while 16.3% and 8.2% of the respondents were in a scale of disagree and neutral respectively.

According to the respondents, Single point failure, High ATM Downtime, Lack of proper ATM monitoring tool and Lack of proper Electronic Journal archiving tools are another setback the NSS is facing. 57.2%, 66.3%, 69.4% and 70.5% of the responses were in support of these points. As for single point failure, Ethiopay is the one who is actually doing the routing and distribution of transactions, a failure in the central switch system hinders other commercial banks to entertain their customers for Remote ONUS and OFFUS transactions. Furthermore, according to the respondents, Lack of proper ATM monitoring tool and Lack of proper Electronic Journal archiving tool has a cascading effect in high ATM downtime and customer dispute handling process.

4.3.2.2. Assessment of Customer related Challenges

Table 4.3.2.2: Assessment of Challenges Related with Customers

Challenges Related with Customers							
Items	**Level of Agreement**					**Mean**	**SD**
	SD	**D**	**U**	**A**	**SA**		
Banking Customers are not aware of the services delivered by National Switch System	7	10	16	48	17	3.59	1.111
	7.1%	10.2%	16.3%	49.0%	17.3%		
Poor customer knowledge on basic IT and E-banking	4	10	9	52	23	3.82	1.039
	4.1%	10.2%	9.2%	53.1%	23.5%		
The commission per transaction is not attractive for customers to use National Switch System	8	19	17	36	18	3.38	1.223
	8.2%	19.4%	17.3%	36.7%	18.4%		
Perceived complexity influence customers	2	9	5	70	12	3.83	.838
	2.0%	9.2%	5.1%	71.4%	12.2%		
Perceived cost influence customers	5	14	25	42	12	3.43	1.045
	5.1%	14.3%	25.5%	42.9%	12.2%		
Customers are concerned about the security of their account provided by the bank	3	10	25	54	6	3.39	.876
	3.1%	10.2%	25.5%	55.1%	6.1%		
Customers are not satisfied with the network quality provided	5	7	10	44	32	3.93	1.086

by Ethio-Telecom	5.1%	7.1%	10.2%	44.9%	32.7%		
Customers do not feel secure when performing transactions through National Switch System	5	20	22	36	15	3.37	1.125
	5.1%	20.4%	22.4%	36.7%	15.3%		
Customers are not well informed what they should do, in case of failed transaction (e.g. card captured, wrong PIN, cash not dispensed)	3	13	8	38	36	3.93	1.124
	3.1%	13.3%	8.2%	38.8%	36.7%		

56.3% of the responses indicates that banking customers are not well aware of the services delivered by NSS. This finding is supported by Bultman (2014). He stated that, lack of social awareness/ lack of familiarity with different technology and lack of sufficient skills to use and implement ebanking system were considered as barriers to adopt ebanking system in Ethiopia. Besides, 76.6% of the responses shows that customers have poor knowledge on basic IT and e-banking to hinder the successful operation of NSS. Lack of familiarity with different technology and lack of sufficient skills are also the points supported by Bultman (2014)

Considering the commission per transaction, 55.1% were agreed, 27.6% were disagreed while the rest 17.3% were disagreed with the statement where the commission per transaction is not attractive for customers to transact through NSS. Besides, 55.1% were agreed, 19.4% were disagreed and 25.5% were neutral for the statement where perceived cost influences customers to transact through NSS.

Customers' assumption on the complexity of the service given by NSS is another challenge which mainly is a result of little awareness they have. 83.6% of the responses indicates the above. Bultman's findings can also be drawn here as a supporting argument as social awareness is the challenge for customers to perceive as the service offered by NSS is complex.

Regarding the security of customers' account, 61.2% of the response shows that customers are concerned about the security of their account provided by the bank when transacting through NSS. Likewise, the respondents were asked if customers do not feel secure when performing transactions through NSS, and 52.0% of the respondents were agreed, 25.5% were disagreed and the rest 22.4% were neutral. The finding here is supported by the findings of Taddesse & Kidan (2005) where they stated that, "New technologies will not dominate the market until customers are confident that their privacy will be protected and adequate assurance of security is guaranteed".

Regarding the infrastructure quality which specially is delivered by Ethio-Telecom, the respondents agreed by the service is poor which impacts customers' satisfaction in a negative way. The response rate of 77.6% were in support of the statement.

There are rare possibilities that transactions might go wrong. As a result, Customers' account may be debited without dispensing the cash due to different technical reasons. In this regard, customers are not well informed what their next move should be. The result is supported by the respondents where 75.5% of them agreed on the point, 16.4% were disagreed and the rest 8.2% were neutral.

4.3.2.3. Assessment of Service Delivery related challenges

Table 4.3.2.3: Assessment of Challenges Related with Service Delivery

Challenges Related with Service Delivery							
Items	**Level of Agreement**					**Mean**	**SD**
	SD	**D**	**U**	**A**	**SA**		
Service interruption is not tolerable or acceptable by customers	0	0	10	56	32	4.22	.618
	0%	0%	10.2%	57.1%	32.7%		
Unfamiliar user interface and key management (e.g. Must press enter to validate PIN in most terminals)	0	2	7	53	36	4.26	.678
	0%	2.0%	7.1%	54.1%	36.7%		
Employees are not fully aware of the services delivered by National Switch System	2	5	15	40	36	4.05	.957
	2.0%	5.1%	15.3%	40.8%	36.7%		
Lack of proper call center to entertain customers' request	0	2	3	46	47	4.41	.655
	0%	2.0%	3.1%	46.9%	48.0%		
Internal capability of all parties (Commercial banks and Ethswitch)	9	13	18	37	21	3.49	1.229
	9.2%	13.3%	18.4%	37.8%	21.4%		

The respondents strongly agreed that service interruption is not a point where customers are willing to tolerate. 89.8% of the respondents agreed on the point that customers are frustrated if the service is interrupted in the middle of their transaction. In addition, 90.8% of the responses indicates that unfamiliar user interface and key management is another challenge the NSS is facing.

77.5% of the respondents were agreed, 7.1% were disagreed while the rest 15.3% were neutral on the point where employees of commercial banks are not fully aware of the services given by NSS. This contributes to the challenge as bankers should be on the first line to use and promote

new services for customers. As a result, it will boost customers' awareness and initiation to transact with NSS.

According to the respondents, lack of proper call center is also one of the challenges the NSS is fronting. Customers who are already interested in the service and who are using it needs to get a proper and interactive support from the center or from the bank (Acquirer or Issuer) to attend requests or disputes. 94.9% of the respondents were in support of the above statement. Moreover, 59.2% of the respondents agreed, 22.5% were disagreed and 18.4% were neutral on the point where internal capability of all parties (Commercial banks and Ethswitch) is considered as a challenge for NSS.

4.3.2.4. Assessment of Perceived Usefulness challenges

Table 4.3.2.4: Assessment of Challenges Related with Perceived Usefulness

Challenges Related with Perceived Usefulness							
Items	**Level of Agreement**					**Mean**	**SD**
	SD	**D**	**U**	**A**	**SA**		
Transactions are not executed quickly and efficiently	8	33	6	34	17	3.19	1.298
	8.2%	33.7%	6.1%	34.7%	17.3%		
Complex procedures for conducting payments	8	31	10	38	11	3.13	1.215
	8.2%	31.6%	10.2%	38.8%	11.2%		
Lack of trust	6	10	17	54	11	3.55	1.027
	6.1%	10.2%	17.3%	55.1%	11.2%		
Customers fear risks related with using National Switch system	2	9	9	50	28	3.95	.967
	2.0%	9.2%	9.2%	51.0%	28.6%		

Respondents were asked if the transactions are not executed quickly and efficiently and, 52.1% of them were agreed, 41.9% were disagreed and the rest 6.1% were neutral. Likewise, the respondents were asked if the procedures for conducting payment through NSS is complex and, 50% were agreed, 39.8% were disagreed while the rest 10.2% were neutral.

Customers somehow lack trust for the solution which can be considered as another challenge for NSS. Most of the time, this trust issue comes from undispensed cash after deducting the amount from customers' account. The result is supported by the respondents where 66.3% were agreed on the point. Furthermore, Taddesse & Kidan (2015), has also argued that new technologies also

requires the test of time in order to earn the confidence of the people, even if it is easier to use and cheaper than older methods. In addition, customers not only lack trust, but also they have fear of risk especially emanated from undispensed cash while their account is debited. The response rate of 79.6% to be in a scale of agree supports the above.

4.3.2.5. Assessment of Operation and Others related challenges

Table 4.3.2.5: Assessment of challenges Related with Operation

Challenges Related with Operation							
Items	**Level of Agreement**					**Mean**	**SD**
	SD	**D**	**U**	**A**	**SA**		
National Switch System is subjected to fraud	6	18	24	38	12	3.33	1.101
	6.1%	18.4%	24.5%	38.8%	12.2%		
Handling disputes emanated from customers takes too much time to settle and credit the customer account	2	4	7	48	37	4.16	.882
	2.0%	4.1%	7.1%	49.0%	37.8%		
Occasional failure of transactions (e.g. cash not dispensed) frustrates customers	0	3	9	44	42	4.28	.757
	0%	3.1%	9.2%	44.9%	42.9%		
Poor Project management and enforcement	3	3	12	33	47	4.20	.984
	3.1%	3.1%	12.2%	33.7%	48.0%		
Poor management of disputes	6	3	5	33	51	4.22	1.099
	6.1%	3.1%	5.1%	33.7%	52.0%		
Poor management of Settlement and Reconciliation	2	9	6	29	52	4.22	1.051
	2.0%	9.2%	6.1%	29.6%	53.1%		
Poor Customer Support (e.g. Captured Card)	0	6	8	29	55	4.36	.876
	0%	6.1%	8.2%	29.6%	56.1%		
Poor Cooperation among commercial banks	2	5	17	29	45	4.12	1.008
	2.0%	5.1%	17.3%	29.6%	45.9%		
Low level appetite for entrant banks to join EthSwitch	3	17	22	32	24	3.58	1.130
	3.1%	17.3%	22.4%	32.7%	24.5%		

51% of the respondents were agreed, 24.5% were disagreed and the rest 24.5% were neutral on the point where National Switch System is subjected to fraud. Another challenge that the respondents agreed on is, the dispute handling time frame. According to the respondents, most of the disputes take too much time, usually more than two weeks. To the contrary, the maximum chargeback period is 8 days starting from the reception of the customer complaint. In this regard,

86.8% of the respondents were in the scale of agree while, 6.1% were disagreed and 7.1% were neutral.

According to the respondents, Occasional failure of transactions, Poor management of disputes, Poor Customer Support and Poor cooperation among commercial banks are main operational challenges hindering the successful delivery of ebanking services through NSS. 87.8%, 85.7%, 85.7%, and 75.5% of the respondents respectively agreed on each point. Even though there is a proper dispute handling procedure in place, the management of disputes is poor and this eventually leads to customer dissatisfaction as disputes will take extended period of time to be settled and credited to the customers' account. Likewise, there is poor cooperation among commercial banks, especially in case of the need to settle disputes raised by customers.

Once again, the respondents have agreed that NSS is facing a challenge regarding project management capability. New ATM Services and go live for POS services should have been in business by now according to the plan by Ethswitch, but so far there are only two ATM services that are live for customers. 81.7% of the respondents agreed on the statement, while 6.2% were disagreed and the rest 12.2% were undecided.

The respondents was also asked if NSS is being challenged by poor management of settlement and reconciliation and 81.7% were agreed, 11.2% were disagreed and 6.1% were undecided.

5. Summary of Findings, Conclusion and Recommendations

5.1. Summary of Findings

Based on the results of the study discussed in the previous chapter, the following key findings are made:

5.1.1. Summary of Findings on Opportunities

Five variables were considered to capture the opportunities brought by National Switch System. Besides, all the variables are further segregated in to different parameters to understand how NSS created an opportune moment for customers. Based on this, the summary is discussed below.

Technology

- ✓ The flexibility of National Switch System in terms of adopting different protocols for integration made it is easier for commercial banks to introduce new services and features to their ebanking services.
- ✓ National Switch System modernizes ebanking service delivery of the country
- ✓ Technological resources are efficiently being used through National Switch System

Customer

- ✓ National Switch System provides convenience for customers as they can transact anytime, anywhere and using any ATM terminal
- ✓ National Switch System reduces cost of transaction
- ✓ National Switch System saves time
- ✓ Since the adoption of National Switch System, conducting banking transactions become easier

Service Delivery

- ✓ National Switch System increases access to finance
- ✓ Additional services and features other than the mainstream ebanking services can be attained through National Switch System

- ✓ Accessibility of an account has been increased for ebanking customers through National Switch System
- ✓ Customer complaint procedures are being kept in case of dispute

Perceived Usefulness

- ✓ National Switch System provides convenient access to banking services
- ✓ National Switch System increases effective use of time
- ✓ Availability of wide range of terminals for customers to transact
- ✓ National Switch System reduces banking cost

Operation and others

- ✓ The vision to create cashless society can be achieved through National Switch System
- ✓ National Switch System can be a tool towards achieving NBE's financial inclusion strategy
- ✓ National Switch System addresses the issue with the need to outsource a switch to significantly minimize the cost of acquiring own switch.
- ✓ National Switch System is a means of income generation for commercial banks in terms of transaction fees

5.1.2. Summary of Findings on Challenges

As the opportunities, the same five variables were considered to capture the challenges hindering the successful delivery of ebanking services through National Switch System.

Technology

- ✓ Network and power fluctuation are setbacks that the National Switch System is facing
- ✓ Mobilization of commercial banks is a tough job for National Switch System to introduce and implement new services
- ✓ Single point failure is considered as a challenge for National Switch System
- ✓ High ATM downtime, Lack of proper ATM monitoring tool and lack of proper electronic journal archiving tool is another technological setbacks for National Switch System

Customer

- ✓ There is awareness gap by customers about the services delivered through National Switch System
- ✓ Perceived complexity and Perceived cost is another challenge that the National Switch System is experiencing
- ✓ Customer satisfaction is less with the network quality provided by Ethio-Telecom
- ✓ Limited awareness on how to raise disputed transactions from customers perspective

Service Delivery

- ✓ Customers do not tolerate service interruption in the middle of their transaction. If so, they lose interest of transacting through National Switch System
- ✓ Unfamiliar user interface makes it tough to deliver ebanking services through National Switch System
- ✓ Lack of proper call center to handle customers' requests
- ✓ Internal capability and/or initiation of commercial banks and Ethswitch is major challenge for National Switch System
- ✓ Employees' knowledge gap, especially in commercial banks, is another concern for National Switch System that in turn created knowledge gap for customers.

Perceived Usefulness

- ✓ Lack of trust and fear of risks are the major challenges that customers feel to prohibit themselves from transacting through National Switch System

Operation and others

- ✓ Occasional failure of transactions and Dispute handling time frame is another major setback for National Switch System. Customers' will restrain themselves from transacting through National Switch System if their disputes are not responded with a reasonable period of time
- ✓ Poor project management and enforcement hinders the implementation and introduction of new services
- ✓ Poor management of settlement and reconciliation

- ✓ Poor customer support in case of disputed transaction and poor management of disputes are also another major challenge for National Switch System
- ✓ During the beginning of system integration, entrant banks had low appetite to join the National Switch System. Which somehow was a challenge for National Switch System on integration phase

5.2. Conclusion

The main objective of the research was to assess the opportunities and challenges associated with the adoption of National Switch System in Ethiopia. Bearing this in mind, basic research questions were developed and respondents' opinions were collected from eight selected commercial banks and Ethswitch, which targeted employees whose place of assignment are related with the subject matter of the research. Based on the objective of the study and problem statement, the following conclusions were made:

Regarding the opportunities brought by National Switch System, the study showed that customers can be indulged with new services and functionalities due to the interest of commercial banks to have a cost effective way of delivering new products for their customers. In doing so, not only the industry becomes modernized, it also creates efficient technological resource utilization. In addition, it is also one way of income generation for commercial banks.

Furthermore, the adoption of National Switch System creates a convenient environment for customers to save their resources in terms of money and time by availing a wide range of ATM Terminals and thereby increases the accessibility of customers' account. On the other side, National Switch System contributes to the NBE's financial inclusion strategy and it can also be considered as a tool to create cashless society.

However, the adoption of National Switch System comes with its challenges. According to the findings in chapter 4, network and power fluctuation are the major ones as those are among the many reasons for disputes to occur other than the inconvenience created. The challenge here is being cascaded to poor settlement to credit customers' account in case of disputed transaction in a reasonable time frame. And this is due to poor cooperation among commercial banks, lack of proper electronic journal archiving tool, poor management of disputes and lack of proper call center to handle customer complaints in time.

The challenge of National Switch System comes from customers as well. Lack of trust and fear of risks are some to mention. Most of the time, these cases are emanated from occasional failure of transactions and limited awareness that the customers have on the services and how they can file a dispute in case of failed transactions which debited their account. Customers also have knowledge gap which makes them perceive the service provided by National Switch System is complex and has cost impact.

The other big challenge that National Switch System facing is, poor management and enforcement of projects. This hampers the introduction of new services through ATM and POS Terminals for the public at large.

On account of the above findings and transaction data from National Switch System, which shows a daily success rate of +74%, National Switch System can be considered effective bearing that the solution is in its infant period.

5.3. Recommendations

Based on the above mentioned findings and conclusions, the researcher recommends the following points:

- ✓ Commercial banks shall sort money when loading ATM to prevent potential problem bill that could cause jams which in turn leads to disputes. They should avoid bills that are dogged eared, torn, soggy or new bills.
- ✓ Carry out software updates and other scheduled maintenance activities when customers are unlikely to be using their ATMs, such as in the middle of the night.
- ✓ Use a real-time ATM monitoring and management system that offers multi-vendor management processes and automated routing to internal and/or external problem owners, as well as providing management reporting on vendor performance, customer usage and internal help desk operations.
- ✓ Commercial banks shall strengthen their relationship by having formal meetings as well as instituting more frequent informal sessions on specific topics and following through with action points

- ✓ Commercial banks shall train or acquaint their employees with the services and operations of National Switch System. This will help to deliver required support to customers and alleviate issues that can be addressed with minimal effort.
- ✓ Backup power and network shall be available on the center as well as for ATM terminals
- ✓ Awareness creating session shall be organized by Ethswitch and member commercial banks for customers so that it will help them to stay abreast with the basic operations. (Cash Withdrawal, Balance Enquiry, Filing a dispute, and others)
- ✓ Besides the real time monitoring tool, there shall be proper EJ archiving tool as it is the primary data considered during dispute management.
- ✓ Project management and enforcement aspect of Ethswitch and commercial banks should be strictly assessed so that new services besides ATM to be launched. In this regard, customers demand alternate channels as the services being delivered now are limited to a single channel with only two services.

5.4. Further Studies

This study has considered inputs from Commercial banks and Ethswitch employees to assess the opportunities and challenges of National Switch System. The researcher recommends that further studies on the same subject shall be made considering the inputs of Customers and other stakeholders so as to reach to a better generalization.

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Amit Bhatnagar 2014 NFS Operating and Settlement Guidelines (NFS-OSG)

Appendices

Appendix A

ADDIS ABABA UNIVERSITY

FACULTY OF BUSINESS AND ECONOMICS

MBA PROGRAM

Dear Respondent,

I would like to extend my deepest appreciation for putting your valuable time to respond to the below questions and also I thank you for giving your honest and prompt responses.

This questionnaire is designed to collect data related to Opportunities and Challenges of Adopting National Switch System (Ethio-Pay), a case study in Ethiopian commercial banks. The collected data will be used as a primary data for the research i am conducting as a partial fulfillment of my MBA program. Please, be rest assured that the information you provide here will be used only for academic purpose and is confidential.

If you have any questions about the survey, please email me: yoniumgreat20@gmail.com or you can also reach me through my cell phone number: +251913055740

Profile

1. Gender

   Male ☐ Female ☐

2. Age

   20 – 30 ☐ 31 – 40 ☐ 41 – 50 ☐ 51 and Above ☐

3. Highest level of Education attended

   Diploma/TVET ☐ First Degree ☐ Master's Degree ☐ PHD ☐

4. Job Title

   Junior Officer ☐ Officer ☐ Senior Officer ☐ Manager ☐ Director ☐

   Other _____

5. Name of Organization / Bank _____

6. Years of Experience

   Less than 5 Years ☐ 5 – 10 Years ☐ 10 – 15 Years ☐ 15 – 19 Years ☐

   20 Years and above ☐

Please read the statements and indicate to what extent you agree or disagree by marking "" to your choice under each category where:

SD stands for strongly Disagree

D stands for Disagree

U stands for Undecided

A stands for Agree and

SA stands for Strongly Agree

Opportunities brought by National Switch System						
Technology		SD	D	U	A	SA
1	Adding new services and features is easier through National Switch System as only integration is needed from commercial banks					
2	Modernization of Payment instruments in terms of introducing new technology					
3	Efficient resource utilization					
4	Flexibility of the National Switch System to introduce New services					
5	Flexibility of the National Switch System to work on different protocols for commercial banks to integrate with (e.g. ISO8583, Webservice)					
Other Technological Opportunities, if any 1. 2. 3.						
Customers		SD	D	U	A	SA

6	Customers can use e-banking services anytime and anywhere using any commercial banks' terminals					
7	National Switch System reduces cost of transaction for customers as one can use any terminal available in the vicinity					
8	Customers found the service provided by National Switch System easy to use					
9	National Switch System provides convenience since it is available 24 hours, 7 days of the week					
10	National Switch System makes it easier to conduct banking transactions					
11	National Switch System saves time compared to traditional banking (transaction through issuer bank)					
Other Customer related opportunities, if any 1. 2. 3.						
Service delivery		SD	D	U	A	SA
12	National Switch System enhance access to finance					
13	Customers found the accessibility of National Switch System better than visiting a branch					
14	National Switch System gives additional services and features (e.g. TOPUP, Other bank transfer …)					
15	Banks properly maintained customer compliant handling procedure in case of problems experienced with the service					
16	National Switch System enables customers to access their account more quickly					
Other opportunities related to service delivery, if any 1.						

2. 3.						
Perceived usefulness		SD	D	U	A	SA
17	Convenient access to banking services					
18	Increases the effective use of time, for example by not having to wait in line					
19	Availability of a wide range of terminals / Availability of all commercial bank terminals for transaction					
20	Reducing banking costs, such as transportation cost					
Other Opportunities related to Perceived usefulness, if any 1. 2. 3.						
Operation & Others						
21	National Switch System stimulates cashless society by bending the common way of doing banking transactions					
22	National Switch System plays a great role towards NBE's financial inclusion strategy					
23	Acquiring own switch is capital intensive, which can be addressed through National Switch System					
24	Acquiring other bank cards became a means of income generation for commercial banks in terms of transaction fees					
25	National Switch System Increases economy of scale for commercial banks					
26	Saves foreign currency and investment of commercial banks and the country					
Other opportunities related to Operation & Others, if any 1.						

2. 3.						
Challenges of adopting National Switch System						
Technology		SD	D	U	A	SA
27	Technological capability of the Payment System of commercial banks is less to cop up with the features of National Switch System					
28	Technological capability of National Switch System is poor to introduce and implement new services and features to customers					
29	Employees' skill in terms of technology is minimal and there is poor knowledge transfer.					
30	Network and power fluctuation can be considered as a sanction for the successful delivery of e-banking services through National Switch System					
31	Implementation of new services is tough considering mobilization of each commercial bank to actively engage on the integration.					
32	Single point of failure: If the interface of National Switch System is down, no commercial bank can support transactions of other commercial bank customers.					
33	High ATM downtime					
34	Lack of proper ATM monitoring tool					
35	Lack of proper Electronic Journal archiving tool					
Other challenges related to Technology, if any 1. 2. 3.						
Customers		SD	D	U	A	SA

36	Banking Customers are not aware of the services delivered by National Switch System					
37	Poor customer knowledge on basic IT and E-banking					
38	The commission per transaction is not attractive for customers to use National Switch System					
39	Perceived complexity influence customers					
40	Perceived cost influence customers					
41	Customers are concerned about the security of their account provided by the bank					
42	Customers are not satisfied with the network quality provided by Ethio-Telecom					
43	Customers do not feel secure when performing transactions through National Switch System					
44	Customers are not well informed what they should do, in case of failed transaction (e.g. card captured, wrong PIN, cash not dispensed)					
Other challenges related to customers, if any 1. 2. 3.						
Service delivery		SD	D	U	A	SA
45	Service interruption is not tolerable or acceptable by customers					
46	Unfamiliar user interface and key management (e.g. Must press enter to validate PIN in most terminals)					
47	Employees are not fully aware of the services delivered by National Switch System					
48	Lack of proper call center to entertain customers' request					
49	Internal capability of all parties (Commercial banks					

	and Ethswitch)					
Other challenges related to Service delivery, if any 1. 2. 3.						
Perceived usefulness		SD	D	U	A	SA
50	Transactions are not executed quickly and efficiently					
51	Complex procedures for conducting payments					
52	Lack of trust					
53	Customers fear risks related with using National Switch system					
Other challenges related to Perceived usefulness, if any 1. 2. 3.						
Challenges related with Operation & Others		SD	D	U	A	SA
54	National Switch System is subjected to fraud					
55	Handling disputes emanated from customers takes too much time to settle and credit the customer account					
56	Occasional failure of transactions (e.g. cash not dispensed) frustrates customers					
57	Poor Project management and enforcement					
58	Poor management of disputes					
59	Poor management of Settlement and Reconciliation					
60	Poor Customer Support (e.g. Captured Card)					
61	Poor Cooperation among commercial banks					
62	Low level appetite for entrant banks to join EthSwitch					
Other challenges to Operation & Others, if any 1. 2. 3.						

Appendix B

EthSwitch

Apr 18, 2019 Transaction Decline Response Summary

BANK NAME	CBE	BOA	ABAY	ASHEN	EGAGEN	ZEMEN	BUNNA	ENAT	DGB	LION	OIB	BRIB	UB	AIB	CBO	NIB	ADIB	Total
503	1311	0	0	0	72	0	0	0	0	0	0	17	58	111	15	26	6	1616
504	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
805	26	0	0	2	0	0	0	0	0	0	0	8	0	3	0	0	0	39
801	15	60	5	22	4	0	0	0	0	1	300	71	415	463	49	49	2	1456
802	13	68	83	57	2	0	7	0	0	3	1549	5	153	263	396	3	4	2606
812	144	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	144
827	0	189	41	138	4	17	0	0	0	0	30	0	7	159	47	2	1	635
886	1	0	0	0	0	0	0	0	0	0	0	3	4	38	34	114	1	195
858	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
804	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	6
821	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
878	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
901	660	99	31	182	0	0	23	6	4	15	31	34	38	158	23	44	3	1351
904	0	126	1	0	61	0	28	6	7	21	30	45	63	171	22	72	18	671
909	0	0	16	0	0	0	0	0	0	0	0	25	2	0	0	0	0	43
911	123	0	0	32	0	0	0	0	0	0	0	0	0	0	0	0	0	155
912	0	22	0	41	88	0	0	0	0	0	0	5	29	18	6	16	1	226
979	0	0	0	0	58	0	0	0	0	0	0	0	0	0	0	0	0	58
915	1000	187	28	186	55	0	46	3	0	14	101	42	95	319	0	0	8	2084
939	546	0	0	0	3	2	0	0	5	0	0	0	0	1	0	1	0	558
902	0	0	0	0	0	0	0	0	0	16	1	0	0	0	0	0	0	17
959	0	0	0	1	0	0	0	0	6	0	0	0	0	0	0	0	0	7
906	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
905	118	0	0	0	0	0	0	0	0	21	2	0	0	0	0	0	0	141
913	0	0	0	0	120	0	0	0	0	0	0	0	0	0	0	0	0	120
914	0	13	0	500	0	0	51	5	7	60	107	0	0	0	0	0	0	743
917	0	0	0	0	0	0	15	3	6	6	15	0	0	0	0	0	0	45
952	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
857	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
988	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	**3957**	**768**	**205**	**1161**	**467**	**25**	**170**	**23**	**35**	**157**	**2166**	**255**	**864**	**##**	**592**	**327**	**44**	**12920**
SUCC. RATE (%	83%	77%	67%	74%	70%	87%	73%	83%	51%	75%	31%	72%	63%	67%	53%	76%	80%	74%

Response Code	Description	Remark
503	Not valid EMV	Not valid EMV transaction
504	Card Operating rule does Not allow this	Card Operating rule does Not allow this transaction
801	Time out	Bank Core banking system (CBS) or Issuer Switch did not respond
802	Issuer not operative	Bank is disconnected from Ethswitch
804	Card is not permitted	Card is not permitted by the system for transaction
805	ERROR - 805	
812	Message received was	The message was received in wrong format which can not be parsable by the system
821	Wrong PIN, Excessive	Wrong PIN is entered, wrong PIN is entered 3 and more times
827	Do not honor	Generic Response from the Bank (Exactly not known)
857	Requested amount was	Requested amount was out of range allowed by the issuer.
858	Processing error during	Error related with Keys
862	Excessive PIN failures,	Wrong PIN is entered 3 times & card is not captured by ATM
873	Issuing BIN is unknown	Card is unknown by Ethswitch
878	Account is locked	Account is locked in CBS
886	Card inactive	Card is not in active status
901	Invalid PIN	Customer enter invalid PIN or wrong PIN
902	Cannot Process	The transaction is cannot be processed by the system due to some format error
904	Excessive PIN failures,	Wrong PIN is entered 3 times & card is captured by ATM
905	Invalid Card	Card is not found in Data base
906	Card Has Expired	Card Has Expired
909	Invalid card, capture.	The card is not valid or cannot be used for transaction and captured by the ATM
911	Withdrawal Limit	Maximum limit of amount a customer can withdraw is reached
912	Withdrawal Limit	Maximum limit of amount a customer can withdraw is exceeded
913	Transaction Type Not	Transaction Type Not Supported By Institution
914	Invalid Account	wrong Account linked to card
915	Insufficient Funds	Customer wants to withdraw cash more than what he has in the account
917	ATM or POS limit	ATM or POS transaction amount limit exceeded
939	No such response	Unknown response code responded by the Bank
952	Fraud is suspected	This Response code is sent when transaction is done using fallback method
959	System malfunction	System malfunction
979	Invalid account type	Customer has savings account but select checking account while performing transaction or vice versa
988	Service not available at	Service not available at the time when transaction is performed

Source: Ethswitch